The United States Coast Guard

Marine Safety Manual

Volume II: Materiel Inspection

COMDTINST 16000.7A

U.S. Department of Transportation
United States Coast Guard

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COMMANDANT INSTRUCTION M16000.7A

Subj: USCG MARINE SAFETY MANUAL, VOL. II: MATERIEL INSPECTION

1. PURPOSE. This Manual is for the information, use and guidance of Coast Guard personnel and the maritime industry. It presents the authority, background, and rationale for the various activities which comprise the federal program for accomplishing vessel, facility, and equipment inspections. This volume provides amplifying guidance to the essential functions which must be performed to attain the overall marine safety objectives of the Coast Guard.

2. ACTION. District commanders and commanding officers shall ensure that personnel performing marine safety duties are familiar with the provisions of this volume. In cases of apparent conflict between this volume and provisions of statutes or regulations, the latter provisions shall be applied and Commandant (G-MOC) shall be advised of the apparent conflict. In cases where there is an apparent conflict between the volume and current marine practice, Commandant (G-MOC) should be contacted for further resolution of the matter. Appropriate action will be taken in such cases to correct conflicting provisions of this volume.

3. DIRECTIVES AFFECTED. The USCG Marine Safety Manual, Volume II: Materiel Inspection, COMDTINST M16000.7 dated 22 July 1985 and all MVI/MOC policy letters issued prior to 01-99 are hereby cancelled.

4. DISCUSSION.

a. This Manual incorporates all MVI/MOC Policy Letters issued prior to MOC Policy Letter No. 01-99 and reorganizes related chapters of the USCG Marine Safety Manual Volume II: Materiel Inspection, COMDTINST 16000.7 (canceled) into sections. It should be noted that not all content of this Manual has been fully updated. However, Section D (Port State Control Examinations) includes many changes not prescribed in

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	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
A																										
B		8	*		5									150	1	1	2									5
C					*							1	*													
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previous policy letters. This section should be read thoroughly. The content of this manual will be updated on a continuous basis.

b. An electronic (non-official) copy of the Manual can be found via the Coast Guard Internet Website (http://www.uscg.mil/hq/g-m/nmc/pubs/msm/).

c. The Prologue outlines the reorganization of this Manual, the location in the Manual where policy letters have been incorporated, and a cross-reference guide between old cites and new cites in the Manual. This should be extremely useful in familiarizing users of the Manual with the new structure.

d. Comments, improvements, corrections, suggestions, new input, and recommendations by district and field personnel are encouraged and should be forwarded to Commandant (G-MOC).

5. FORMS/REPORTS. Information about all forms and reports referenced in this document can be found in Appendix D.

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Assistant Commandant for
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PROLOGUE

A. OVERVIEW OF CHANGES TO MARINE SAFETY MANUAL, VOL. II (MSM II)

1. Introduction

This revision is a first step in restoring the MSM II as a valuable tool to the field. This is an ongoing project. The next phase will be a complete content review by all G-M Offices for policy and regulatory currency.

The breakdown of the revision includes:

(1) Incorporation of existing MVI & MOC policy letters;

(2) Reorganization of content into new subject specific sections (A, B, C, etc. with the chapter numbers starting over for each section);

(3) Migration towards Info Mapping® format; and

(4) Minor revisions based on input from a team of senior field personnel (CIDs & Sr. MIs).

(5) Changes in policy of the Port State Control chapters only. Operational changes have been highlighted.

2. Cross-Reference to Old-MSM II

Cross-references are provided as Annexes to this Prologue which identify specific revisions and incorporations made and their corresponding locations. The Annex breakdown is:

Change Cross-Reference Guides	
Prologue Annex	**Type of Revision**
Annex I	Old-MSM II to New-MSM II Organization
Annex II	MVI/MOC Policy Letters Incorporated
Annex III	Field Expert Recommendations Made
Annex IV	Summary of Port State Control Program Revisions

3. The Future of the MSM II

Please familiarize yourself with the promulgation letter to this revision. In it is a set of guidelines and procedures for recommending changes to future editions of this volume, in addition to identifying specific control procedures for managing the MSM II. The "M" Quality Management Board (M-QMB) has chartered a Quality Action Team (QAT) to review the current state of M Policy and Guidance Process and make recommendations for improvements. Until those recommendations, if approved, are implemented, the guidance provided in the promulgation letter will be the official policy relative to the MSM II.

All levels of the "M" Program are encouraged to participate in making the MSM II a better tool for the M Community—Coast Guard, industry, and the general public. The instruction provided identifies a feedback mechanism to ensure all salient comments are routed for consideration by G-MOC.

PROLOGUE ANNEX I: OLD-MSM II TO NEW-MSM II ORGANIZATION

Old Ch.	Title	New Ch.	Notes	New Section
1	Authority & Provisions for Merchant Vessel Inspections	A.1		A. Marine Inspection Administration
2	Administration of Merchant Vessel Inspections	A.2		A. Marine Inspection Administration
3	Documentation of Vessel Inspections	A.3		A. Marine Inspection Administration
4	Approval of Plans and Specifications	A.4		A. Marine Inspection Administration
5	Vessel Construction, Conversions, Alterations, and Repairs	A.5		A. Marine Inspection Administration
6	Inspection of Vessels for Certification	B.1		B. Domestic Inspection Programs
7	Vessel Reinspections	B.2	Add B.2.G. CAIPs	B. Domestic Inspection Programs
8	Hull Examinations	B.3	Add B.3.I. CAIPs	B. Domestic Inspection Programs
9	Inspections Relative to SOLAS Requirements	E.2		E. International Conventions, Treaties, and Standards
10	Inspection Procedures Applicable to Vessel Types, Classes, and Categories	B.4	Add Chapter 36 in its entirety to old Ch. 10, new B.5 Old 10.A.8 renamed 10.A.9. New 10.A.8 concerns insp of welds on alum SPVs.	B. Domestic Inspection Programs
11	Carriage of Combustible and Flammable Cargo	F.2		F. Carriage of Hazardous Materials
12	Inspection of Public Vessels	B.5		B. Domestic Inspection Programs
13	Miscellaneous Vessel Inspection Activities	C.4		A. Marine Inspection Administration
14	Steering Gear Systems		Incorporated into C.4. *Miscellaneous Vessel Inspection Activities* at C.4.F. with remainder re-numbered accordingly. See TOC	C. Inspections of Engineering Systems, Equipment, and Materials
15	Inspection of Inert Gas Systems	C.5		C. Inspections of Engineering Systems, Equipment, and Materials
16	Marine Equipment and Materials	C.1		C. Inspections of Engineering Systems, Equipment, and Materials

PROLOGUE ANNEX I: OLD-MSM II TO NEW-MSM II ORGANIZATION

Old Ch.	Title	New Ch.	Notes	New Section
17	Factory and Shop Inspections of Equipment and Materials	C.3		C. Inspections of Engineering Systems, Equipment, and Materials
18	Inspections of Vessel Equipment and Materials	C.2		C. Inspections of Engineering Systems, Equipment, and Materials
19	General Aspects of Port State Control Examinations	D.1		D. Port State Control Program
20	Procedures Applicable to Foreign Passenger Vessels	D.7		D. Port State Control Program
21	Procedures Applicable to Foreign Tank Vessels	D.6		D. Port State Control Program
22	Procedures Applicable to Foreign Freight Vessels	D.5		D. Port State Control Program
23	Targeting of Foreign Vessels	D.4		D. Port State Control Program
24	Procedures Applicable to Exercising Control Over Foreign Vessels Under U.S. Jurisdiction	D.2		D. Port State Control Program
25	Procedures to Ensure Accountability for Port State Control Boardings and Detentions	D.3		D. Port State Control Program
26	Hazardous Materials Safety	F.1		F. Carriage of Hazardous Materials
27	Carriage of Bulk Liquid Chemicals	F.3		F. Carriage of Hazardous Materials
28	Carriage of Bulk Liquid Gases	F.4		F. Carriage of Hazardous Materials
29	Other Hazardous Materials Concerns	F.5		F. Carriage of Hazardous Materials
30	Reserved -- TBD		**DELETED**	
31	Pollution Prevention	B.6		B. Domestic Inspection Programs
32	Alternative Compliance Program	B.9		B. Domestic Inspection Programs
33	MARPOL 73/78 Requirements	E.1		E. International Conventions, Treaties, and Standards
34	Marine Facilities and Structures	B.7		B. Domestic Inspection Programs

PROLOGUE ANNEX I: OLD-MSM II TO NEW-MSM II ORGANIZATION

Old Ch.	Title	New Ch.	Notes	New Section
35	Offshore Activities	B.8		B. Domestic Inspection Programs
36	A. Submersible Vessels and Undocumented Vessels	B.4	Move to Old Chapter 10, New Ch. B.4 and split into two separate sections in B.4	B. Domestic Inspection Programs
37	Safety Management Systems (SMS - ISM Code)	E.3		E. International Conventions, Treaties, and Standards
NEW	A. Streamlined Inspection Programs	B.10	Created a new Chapter B.10 on SIP in Sec. B.	B. Domestic Inspection Programs

NOTE: This revision has reorganized the previous chapters under sections based on subject matter. The chapter numbers start over at "1" for each section. The chapter reference now must include both the section and chapter identification. (For example, the old Chapter 1 would now be A.1 or Sec. A, Ch. 1. Old Chapter 37 is now E.3 or Sec. E, Ch. 3.) The new sections are:

Section ID	Section Title
A	Marine Inspection Administration
B	Domestic Inspection Programs
C	Inspections of Engineering Systems, Equipment, and Materials
D	Port State Control Program
E	International Conventions, Treaties, and Standards
F	Carriage of Hazardous Materials

PROLOGUE ANNEX II: MVI/MOC POLICY LETTERS INCORPORATED

Policy Ltr	Title	Old MSM II Location	New MSM II Location
2-85	Reinspection of cargo and misc. vsls	6.C.7.	B1.C.7
10-86	Hydrostatic test of control air receiver aboard the unmanned tank barge CHEMICAL 704	6.Q.4.	B1.Q.4
12-86	Fixed ind. Tanks Aboard OSV's; Cargo Auth & Stab Ltrs	12.F.	B5.F
18-86	Testing of Anhydrous Ammonia cargo tank safety relief valves	27.G.	F3.G
19-86	Foam Analysis	18.I.	C2.I
5-87	Protection from Refridgerants	6.P.5.b.	B1.P.5.b
6-87	Insp of the SS CLIPPER as a "New" Psgr Vsl	6.E.1.e.	B1.E.1.e
15-87	Sanitary insp aboard vsls carrying psgrs (COMDTNOTE 5760)	27.G.	F3.G
17-87	Use of hot ammonia gas t test PV cargo tank safety relief valves	27.G.	F3.G
18-87	Vsl Reinsp reqs (ALDIST 180/87 – COMDTNOTE 16711)	7.F.	B2.F
33-87	Equivalent to OWS on certain barges	31.D.8.	B6.D.8
12-88	Issues relative to determination of psgr operations	10.H.	B4.H
5-89	Enforcement of laws for psgr carrying vsls	10.W	B4.W
7-89	Acceptance of primary L/S equip on L/Bs . . . delegation authority	35.F.2.e.	B8.F.2.e
8-89	Determination of U.S. build of vsls	6.B.	B1.B
12-89	Insp of OBOs	10.Z.	B4.Z
20-89	Insp reqs for Dracones	13.F.	A6.F
1-90	Use of non-armored cable aboard MODUs	35.C.12.	B8.C.12
2-90	Psgr vsl operations investigations	10.Y	B4.Y
5-90	Alt provisions for Reinsp of OSVs in foreign ports	7.D.	B2.D
6-90	Emergency water and rations	18.H.10.	C2.H.10
10-90	SOLAS equivalent arr accepted by U.S. for certain SPVs	3.N.1.c.	A3.N.1.c
15-90	Structural failures of raw water towers on self-elevating MODUs	(24.C.18.)/35.C.18.	B8.C.18
22-90	Guidance on drydock exam interval extensions	8.4.d.(10)(11)	B3.4.d.(10)(11)
28-90	Stamping of ASME cert PVs w/ the USCG symbol	17.E.	C3.E
2-91	Internal insp of permanent fresh water ballast tanks	8.B	B3
3-91	Ring life buoys on unmanned fixed platforms	35.	B8
5-91	Drydock and tailshaft exam interval extensions	8.A.3.b.9.	B3.A
8-91	Major conversion determinations for appl of OPA 90 dbl hull reqs	8.B.7	B3.B.7
12-91	Emergency diesel gen alarm relay circuits	6.N.2.c.	B1.N.2.c
18-91	L/Bs used as launches	10.W.	B4.W
1-92	Alt cargo tank interval exam for Marine Pre-positioning Ships in the Afloat Pre-positioning Force	12.E.5.h.	B5.E.5.h
Policy Ltr	**Title**	**Old MSM II Location**	**New MSM II Location**

5-92	Carriage of oil onboard vsls permanently laid-up, dismantled, or out of commission, being towed to scrap	10.C.4.d. & e.	B4.C.4.d & e
8-92	Ballast tank exams on foreign flag tankers	20.C.	D6.C
9-92	Incorp of industry stds in regs	18.D.6.	C2.D.6
10-92	U.S. and foreign tank vesls – VCS	11.	F2
12-92	Foreign chemical tank vsls; appl of reqs	27.F.29.	F3.F.29
6-93	Insp of Great Lakes barges in conn w/ rev to insp laws	10.E.9.	B4.E.9
18-93	VCS – inland tank barge PV valve reqs of 46 CFR 39.20-11	10.D.10.	B4.D.10
2-94	Small mech fastened shallow water OSRV	10.Q.	B4.Q
1-95	OSRVs	10.Q.	B4.Q
3-95	IGS ops reqs	15.B.	
1-96	Excess equip found on unisp comm fishing vsls	10.S.4.	
2-97	Shore connection: equiv for certain vsls	31.D.3.	
3-97	Insp of welds on new & existing alum SPV	10.A.8 / 5.C.7	B4.A.8/A5.C.7
7-97	Issuance of COI	6.B.1.	B1.B.1
9-97	Testing of L/R hydrostatic release units	17.B.3.	C3.B.3
10-97	Insp of free ferries	12.D.2.	B5.D.2
11-97	Use of miniature thermal overcurrent circuit brkrs on SPV	1.H.3.	A1.H.3
1-98	Ltd Auth to conduct overseas COCs		D6.H.
2-98	LL Regs on domestic voyages: clarification of regs relative to barges transiting beyond the boundary line		A6.F.
3-98	DDE for certain psgr vsls	8.A.4.d.	B3.A.4.d
7-98	CVE – Proc for drills and training on Dav-Launched L/Rs	20.A.4(b)(2)	D7.A.4(b)(2)

NOTE: The remaining MVI/MOC policy letters up through 7-98 have been cancelled or superseded.

PROLOGUE ANNEX III: FIELD EXPERT RECOMMENDATIONS MADE

The following table identifies changes recommended by a team of CIDs and Sr. Marine Inspectors that have been made in this revision.

Recommendation	Change Notes
Former Chapter 1 / New MSM II-A1	
Add D.10—ILO and D.11—STCW	New Sections added to new MSM II-A1
Chg 1.G. to "Applicable Tank Vessel Reqs", and renumber remaining sections (G to H—Req'd Pubs, H to I—Req'd Refs, I to J—MARAD, & J to K—HAZMAT)	Rrevised MSM II-1A.G through K
Add FCC regs (Part 80) to 1.B)	FCC cite added to new MSM II-1B
Delete 1.D.a.(1) in its entirety and renumber	
Former Chapter 2 / New MSM II-A2	
Change ref. to Amex in 2.A.3 to "Govt. Issued-credit card"	
Former Chapter 3 / New MSM II-A3	
Revise C.3 IAW new CG-840 books	
Add new 3.C.3.d.(1) paragraph, and renumber remaining paragraphs. (New para. reads "(1) Steering Gear Inspection. A detailed description . . .."	
Revise 3.C.3.g.(3) to reflect new MSDS in MSIS.	
Delete 3.F.2. "Inventory of Sealing Plier Dies" and renumber section.	
Revise 3.H.2.e. to read "When a reduced manning . . .."	
Former Chapter 4 / New MSM II-A4	
No substantive changes recommended.	
Former Chapter 5 / New MSM II-A5	
Make 5.D applicable to all vessels vice "Tank Vessel . . ."	
Delete 5.F.	
Add SAFETY NOTE to old I.2. (New	
Move old 5.J.2.—Repairs & Alts/Repairs to Boilers . . . to old Ch. 6 / New MSM II-B1	
Remove old 5.K.—Conversion of LSTs . . . addressed in Ch. 10 / New MSM II-B4.R.	
Former Chapter 6 / New MSM II-B1	
Delete 1st three sentences in 6.A. - Introduction ("Certain vessels . . . or treaties.")	
Delete all of 6.B - Auth for Insps as redundant, and renumber remainder of chapter	
Change 6.C.1.a. to replace "are" in first sentence with "may be" and delete remaining two sentences.	

PROLOGUE ANNEX III: FIELD EXPERT RECOMMENDATIONS MADE

Recommendation	Change Notes
Former Chapter 6 / New MSM II-B1 (continued)	
Delete 6.C.2 and renumber remaining.	
Update 6.C.3.a. in light of revised Subchapter T and creation of K.	(now B1.C.2.a.)
Clarify 6.C.4.b.	(now B1.C.3.b.)
Expand on 6.C.4.b.	(now B1.C.3.c.)
Update 6.C.8.	(now B1.C.7.)
Delete 6.C.9. and renumber remaining.	
Delete the first three sentences in 6.C.10	(now B1.C.9.)
Update 6.C.11.d.	(now B1.C.10.d.)
Update 6.C.14. OCMI overseas AORs	
Revise 6.C.15. - Certification of Vessels Undergoing a Reflag and/or Major Conversion, scan and include MOC Policy Ltr 1-97	(now B1.C.14)
Revise 6.E.1.e. (Scope of the Inspection)	(now B1.D.1.b)
Delete 6.E.2.b.(1) and renumber	(Now B1.D.2.b)
Add Table 91.04-3(a) & (b) to old 6.F.1. and revise drydock interval to "twice in five" schedule	(Now B1.E.1. Table)
Delete first 3 sentences of old 6.F.2.a. (now B1.E.2.)	
Delete 6.F.4.a. and renumber (now B1.E.4.)	
Delete sentences 2-4 in 6.G.1. (now B1.F.1.)	
Re-order 6.G.2. and 3 (swap positions)	
Move old 6.G.4 to new B1.N.5, beginning at subpara. b.	
Move last for sentences of old 6.H.a. to new B1.G.2.b.	
Delete first 2 sentences of old 6.H.3.b., move remainder of para. up to para. a. and renumber rest of section (now B1.G.3.)	
Update inspection intervals to 5-yrs & 10-yrs in old 6.H.6.b.(1) and (2) (now B1.G.6.b(1) and (2)) -- make similar updates throughout.	
Delete last sentence of old 6.H.6.d(1)	(now B1.G.6.d(1))
Delete old 6.H.8.a(1) case history and renumber section.	(now B1.G.8.a.)
Delete old 6.H.8.b(1) case history and renumber section.	(now B1.G.8.b.)
Relocate old 6.I. into new B1.F.4	
Add pointer to "Vital Systems Piping" regs of 46 CFR 61.40 and 62 in new B1.I	
Point to FCC regs in Old 6.O. / New B1.M.	
Add subpara (6) to 6.P.8.a.: "Examine laundry room vents . . .."	(New B1.N.8.a(6))
Revise old 6.Q.4.a(2) per new regs.	(B1.O.4.a(2))
Revise old 6.Q.4.a(3) per new regs.	(B1.O.4.a(3))

PROLOGUE ANNEX III: FIELD EXPERT RECOMMENDATIONS MADE

Recommendation	Change Notes
Former Chapter 7 / New MSM II-B2	
Move 7.E—SOLAS Annual Survey Reqs to old-Ch. 9 (new MSM II-E2) and renumber remaining sections.	
Former Chapter 8 / New MSM II-B3	
Delete old 8.A.2.a. and renumber	
Replace old 8.A.4.a. with "With the exception of . . . ."	(New B3.A.4.a.)
Former Chapter 9 / New MSM II-E2	
Insert pointer to FCC regs in old 9.E. (new E2.E)	
Relocate SOLAS reqs for small psgr vsls to new E2.I	
Former Chapter 10 / New MSM II-B4	
Revise 10.A (B4.A) to reflect changes to sub T and creation of sub K	.
Delete everything after the initial paragraph in 10.E.f(3)	
Former Chapter17 / New MSM II-C3	
Delete the 2nd sentence of old para. 17.C.2.d.: "Through the . . . PFDs."	(MSM II-C3.C.2.d.)
Delete the next to last sentence of old para. 17.D. "It may be . . . serial number."	(MSM II-C3.D.)
Former Chapter 18 / New MSM II-C2	
Add "4. Class Societies", renumbering remainder, to old 18.B.	(New C2.B.)
Rename 18.D.1 from "Treaties" to "SOLAS, ICLL, MARPOL" and include note that MARPOL Res. 393 reqs equip to be appvd.	(New C2.D.1.)
Delete 18.D.4. and 5., and renumber.	
Delete remainder of para 18.E.1.a. after the 2nd sentence " . . . covered by these rules."	(New C2.E.1.a.)
Include note in 18.E.1.d. referencing NVIC 3-95 for halon cyls.	
Delete remainder of para. 18.E.3.d(1) after "However, the hose shall be replaced if corrosion of the interior material is found."	
Delete 2nd sentence of para. 18.E.3.d(2)	
Delete all but the 3rd sentence in 18.E.5	(new C2.E.5.)
Relocate old 18.F.3. "LASH Vsl Lighter Cranes to new B1.7	
Relocate old 18.H.3.b(1) & (2) to new C3.B.4.a. & b.	
Delete old 18.H.3.d.	
Delete old 18.H.4.b. and renumber.	

PROLOGUE ANNEX III: FIELD EXPERT RECOMMENDATIONS MADE

Recommendation	Change Notes
Former Chapter 18 / New MSM II-C2 — Continued	
Add note that Stainless Steel wire is not accepted for use as Boat Falls in old 18.H.6.	(New C2.H.6.)
Delete last sentence in old 18.H.10.a(5)	(New C2.10.a(5))
Delete last sentence in old 18.H.10.b(4)	(New C2.10.b(4))
Delete last sentence in old 18.H.10.b(5)	(New C2.10.b(5))
Separate out 18.J.6 "Exemptions and Extensions" into separate sections, and renumber accordingly.	(New C2.J.6 "Extensions" and C2.J.7. "Exemptions"
Delete the last 4 sentences from old 18.J.8.	(New C2.J.9, CACs)
Former Chapter 19 - 25 / New MSM II-Section D—Port State Control	
• These chapters have been revised in their entirety. Information about specific changes are indicated in the "Abstract of Revisions"	Ch. 19 = D1, Ch. 20 = D7, Ch. 21 = D6, Ch. 22 = D5, Ch. 23 = D4, Ch. 24 = D2, Ch. 25 = D3
Former Chapter 33 / New MSM II-E1	
Delete 33.E.6.a(2)(b)	(New E1.E.6.a.(2))
Recommendation	**Change Notes**
Former Chapter 36 / Incorporated into New MSM II-B4	
Relocate entire to new B4.X.	

PROLOGUE ANNEX IV: SUMMARY OF PORT STATE CONTROL PROGRAM REVISIONS

A. SUMMARY OF POLICY CHANGES/ADDITIONS TO MSM VOL. II SECTION D, CHS. 1-7

All previous guidance provided in the monthly messages is either superceded or cancelled by these changes.

1. Ch. 1.B.1 International Compliance and Outreach Division (ICOD). This **change** informs the field of internal changes within the Office of Compliance (G-MOC). The International Compliance and Outreach Division (G-MOC-4) handles Port State Control compliance issues, including **all** foreign flag vessel detentions. The Vessel Compliance Division (G-MOC-2) handles U.S. flag vessel compliance, as well as foreign flag tank and passenger vessel issues, other than detentions.

2. Ch. 1.B.1 PSC Website address. Since SWIII will soon be available to all Marine Safety Offices and their corresponding sub-units, the PSC Website has been provided. The Website is a valuable resource not only for the field but for our external customers as well, as it provides a wealth of information which is easily accessible. This **addition** is provided so that the field can make optimal use of the information available to them.

3. Ch. 1.C.9 & 11 Detention v. Intervention Definitions. There has been significant confusion and debate on the distinctions between these two terms since the inception of the PSC program. The definitions have been refined to help with the distinction. The term Intervention has deliberately been replaced with the term Detention for the purposes of Detention reports submitted to G-MOC-4 for reporting to the IMO.

4. Ch. 1.D Issuance of SOLAS Certificates. Over the past several years, MSO's have been performing SOLAS surveys aboard foreign flagged vessels at the request of the flag Administration. These surveys will be conducted on foreign flagged vessels in cases of emergency only. (In the previous version of the MSM, this section covered the Applicability of the International Conventions, this section has been moved to Chapter A.1.D.).

5. Ch. 1.E Boarding Teams. Previously, a marine inspector was required to perform all Priority 1 and annual PSC examinations. This requirement has been relaxed. This **change** was needed to get the policy in line with the present resource capabilities of our field units.

6. Ch. 1.F.3.a Vessels not party to SOLAS or below convention size. This **change** is provided in an effort to reduce the workload of the field, vessels that operate in U.S. waters which are not party to SOLAS or are below convention size, (not operating in D7), can be examined, conditions permitting, in accordance with IMO Resolution A.787(19).

7. Ch. 1.F.6 Caribbean Cargo Ship Safety Code (CCSSC). This **addition** incorporates policy changes in D7. Due to the overwhelming number of below convention size vessels operating in the D7 area of responsibility (AOR), D7 initiated Operation Safety Net in 1994. Vessels below 500 GT that operate in the D7 AOR, and only in D7, are subject to the rules of the CCSSC.

8. Ch. 1.G.2.b.6 Remote shutoff valves on fuel oil tanks. This **change** incorporates the interpretation made by the IMO's Marine Safety Committee at its 69th session.

PROLOGUE ANNEX IV: SUMMARY OF PORT STATE CONTROL PROGRAM REVISIONS

9. Ch. 1.G.2.k The International Management Code for the Safe Operation of Ships and for Pollution Prevention, better known as, The International Safety Management (ISM) Code. The May 1994 amendments to SOLAS provide for the establishment of the ISM Code. This is one of the most important international regulations ever. This **addition** alludes to Navigation and Vessel Inspection Circular (NVIC 4-98) as the primary reference to be used during the enforcement of the ISM Code and incorporates G-MOC policy letter 1-99.

10. Ch. 1.J Foreign Vessel Examination Books. The examination books for foreign passenger, gas carrier, tankers and cargo vessels are being updated and are **not** included in this change. They will be made available for downloading from the Training Center Website.

11. Ch. 2.E.4 & E.5. Shipboard Oil Pollution Emergency Plan (SOPEP) and Vessel Response Plan (VRP). Previously, a lack of a SOPEP alone was grounds for a detention. The new guidance has **changed** this policy. VRP's were not included in the last manual. This **addition** provides guidance on VRP's.

12. Ch. 2.E.8 Ensuring Safety. Previously, vessels were being detained for deficiencies which were easily correctable while boarding officers were still on the vessel. This **change** provides the OCMI/COTP with greater flexibility in determining whether or not a vessel should be detained.

13. Ch. 2.F.2 & F.3. Points of Contacts. The flag State Administrations and the Classification Societies lists have been updated and are not included in this change. The lists will be made available for downloading from the Port State Control Website.

14. Ch. 2. Annex A Updated Detention Reports Ship Type Codes. With the advent of the ISM Code and in an effort to harmonize our boarding reports with other PSC regimes, it is important that standardized ship type codes be utilized to the maximum extent. These standardized codes significantly reduce confusion for the applicability of regulations and provide a level of consistency with other PSC authorities.

15. Ch. 3.B.2 Record Keeping. Previously, records documenting targeting/boarding decisions were required to be maintained for 2 years. These records are no longer required as this information is easily obtainable from MSIS. This **change** incorporates one of MSO Savannah's cost-savings recommendations.

16. Ch. 3.C.7 Non-Reported Detentions. This **addition** lets the field know the process for vessels which have been detained, yet do not meet the criteria for reporting purposes to the IMO. This is another feedback tool to enhance consistency with national policy.

17. Ch. 3.C.8 Filtering Principles for Classification Society Association of Detentions. This **addition** lets the field know more about the detention process. Field units are encouraged to provide recommendations as to whether or not a classification society should be associated with a detention. Information gathered up-front from the reporting unit will greatly reduce the need for G-MOC-4 personnel to request it at a later time.

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18. Ch. 3.C.9 Appeals. This **addition** lets the field know the process for vessels which have been detained and are subsequently appealed by corresponding flag states, companies and classification societies.

19. Ch. 4.B.1 Targeted Owners Criteria. This **change** takes into account the fleet size of a particular company. If a vessel owner or operator has at least 25 vessels that visit U.S. ports each year, the company will not be targeted unless they accumulate 3 or more detentions within a 12-moth period. To reduce our administrative burden, we will continue to target an owner with the current "2 in 12" criteria, but we will give the company involved an opportunity to demonstrate their fleet size. This change is purely administrative for G-MOC-4 only and does not impact how field units target companies.

20. Ch. 4.B.3 Targeted Classification Society Updated Box Plot. This **change** explains the new method by which Class Societies are evaluated for targeting purposes. The "box-plot" methodology is no longer used. This change is purely administrative for G-MOC-4 only and does not impact how field units target classification societies.

21. Ch. 4.D.1.b & 4.D.2.a.4. Downgrading of Priority 1 and Priority 2 Vessels. In an effort to decrease the workload of the field, this **change** provides new criteria for downgrading P1 and P2 vessels, including the assessing of boardings conducted by the Paris and Tokyo MOU's.

22. Ch. 5.C.6.c The 1995 Amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, better known as, STCW 95. These amendments drastically change the requirements in the previous regulations. This **change** includes the primary changes brought about by the amendments. This update also alludes to NVIC 3-98 as the primary reference to be used during the enforcement of STCW during the course of PSC examinations. There are several references to STCW 95 throughout the PSC chapters.

23. Ch. 5.C.6.f Garbage Management Plan. This **addition** is another new requirement under an amendment to MARPOL 73/78. Policy guidance is provided for this new regulation to Annex V.

24. Ch. 5.C.6.g Global Maritime Distress and Safety System (GMDSS). This **addition** is another new requirement under the 1988 amendments to SOLAS.

25. Ch. 5.C.7.a.8 Rudder angle indicator. This **change** allows for slight variations in the reading of the rudder angle indicator. Previously, vessels were being detained for very small variances.

26. Ch. 5.C.7.d.1.f Cargo Securing Manual (CSM). This **addition** is another new requirement under the 1994 amendments to SOLAS. NVIC 10-97 provides the basic information for CSM's. The enforcement policy for foreign flagged vessels is addressed here.

27. Ch. 5.C.7.g.1(h) Oil transfer hose requirements. This **change** incorporates the new regulations for oil transfer hoses.

28. Ch. 5.C.7.h Lifeboat drills. Due to the continuing number of injuries and lifeboat casualties encountered during the course of lifeboat drills, the guidance for the conduct of lifeboat drills has changed slightly.

PROLOGUE ANNEX IV: SUMMARY OF PORT STATE CONTROL PROGRAM REVISIONS

29. Ch. 6.B.2 Vapor Control Systems (VCS). This **addition** incorporates guidance on VCS.

30. Ch. 6.C.6.c.1 Ballast tank entry. Due to the inherent dangers and the questionable value of performing a ballast tank evaluation during a tank vessel examination on a vessel over 10 years in age, **the requirement for Coast Guard personnel to enter ballast tanks is no longer in effect.** Only in cases when the structural integrity is seriously in question, should Coast Guard personnel enter a ballast tank. This change incorporates District 8's recommendations and cancels MVI policy letters 25-90, 6-91 and 8-92.

31. Ch. 6.C.2.a.(3) Chemical Tank Vessel Information Sheets (CTVIS) This **addition** was provided by the Marine Safety Center.

32. Ch. 6.C.6.g.1(h) Oil transfer hose requirements. This **change** incorporates the new regulations for oil transfer hoses.

33. Ch. 6.C.6.k Emergency Towing Arrangements. This **addition** is taken from the SOLAS requirements under the December 1996 amendments.

34. Ch. 6.H Overseas COC Exams. This **addition** was provided by the Marine Safety Center to provide guidance on overseas inspections.

35. Ch. 7.A.6. USPHS Sanitary Condition Inspections. This **addition** incorporates policy from the Center for Disease Control (CDC).

36. Ch. 7.4.b.(3). Drills and Training on Davit-Launched Liferafts. This **addition** incorporates MOC policy letter 7-98.

CHAPTER 1: AUTHORITY AND PROVISIONS FOR MERCHANT VESSEL INSPECTIONS

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CHAPTER 1: AUTHORITY AND PROVISIONS FOR MERCHANT VESSEL INSPECTIONS

A. AUTHORITY FOR THE INSPECTION OF VESSELS

1. General.

The Coast Guard administers navigation and vessel inspection laws and rules, and regulations governing marine safety. The Coast Guard is tasked with inspecting the vessels to which those laws apply. It is essential that current copies of Titles 33 and 46 of the Code of Federal Regulations (CFR) are maintained at each Marine Safety unit. Application of statutes to a particular vessel is based upon many factors, including: trade, route, length, tonnage, and/or number of passengers. To avoid misunderstandings, the application of statutes should be determined with a particular vessel, type of vessel, or operation in mind. In discussions concerning statutory applications, hypothetical cases should be avoided. Most statutes establish general requirements for inspection and authorize the Coast Guard to prescribe specific standards by regulation. However, certain requirements for vessel standards and procedures are contained within the statute itself.

2. Authority

46 U.S.C. 3305, 3307, and 3714 provide the legal basis for the inspection of vessels that are subject to inspection under 46 U.S.C. 3301. 43 U.S.C. 1356 provides the legal basis for Coast Guard regulations pertaining to vessels engaged in Outer Continental Shelf Activities. 46 U.S.C. 3306 and 3703 direct the Secretary of the Department of Transportation (SECDOT) to prescribe regulations to carry out these requirements.

3. Delegation of Authority from SECDOT

SECDOT has delegated authority to the Commandant, U.S. Coast Guard to administer certain navigation and inspection laws.

The Commandant accomplishes this by prescribing regulations published in Titles 33, 46 and 49 of the Code of Federal Regulations (CFR). These regulations incorporate international laws to which the United States is signatory (see paragraph D), as well as various classification society and industry technical standards. Specific authorities and the process by which regulations are adopted, changed and deleted are described in 33 CFR 1.05 and in the Marine Safety Manual (MSM) Volume 1, Chapter 2.

4. Responsibility of the Officer-In-Charge, Marine Inspection (OCMI)

Under 33 CFR 1.01-20, the OCMI has the final authority and responsibility for carrying out vessel inspection functions within the OCMI's zone. Signature authority for certain inspection documents may be redelegated pursuant to 46 CFR 2.01-30. (See Marine Safety Manual, Volume I, Chapter 2, paragraph 2.I.2.a.(2)) The flow of functional authority from the OCMI to subordinates, and from the Commandant to the OCMI, is described in 46 CFR 1.01-10 and 1.01-15. Descriptions of the duties and responsibilities of the OCMI and other Marine Inspection (MI) Program personnel are presented in MSM Volume I.

5. Handling Violations of Other Laws

It is essential that all inspection personnel have a working knowledge of the laws under which they are operating. Certain laws concerning the safety of vessels are administered by other agencies, e.g., the U.S. Customs Service (Jones Act), the Federal Communications Commission (FCC), the Occupational Safety and Health Administration (OSHA), the Minerals Management Service (MMS) and the Department of Labor. When a vessel is known to be in violation of laws administered by agencies other than the Coast Guard, the agency having jurisdiction should be notified of the circumstances. In some instances, a Memorandum of Understanding (MOU) has been signed between the Coast Guard and the agency that prescribes specific procedures to be followed to ensure that inspection and enforcement activities are complimentary to each agency (see MSM Volume X for a complete listing of all MOUs). Violations of laws administered by the Coast Guard not pertaining to marine safety should be reported to the cognizant Coast Guard District Commander.

B. REGULATIONS AND STATUTES

1. Code of Federal Regulations (CFR)

The OCMI should maintain current copies of all rules and regulations affecting vessel inspections for use by inspection personnel. Current year copies of the CFR should be available for inspectors to use in performing their duties. Regulations, and the subsequent changes to them, are not effective until published in the Federal Register. However, once published, the regulations and regulation changes are codified annually in the CFR. The following is a partial list of the CFR subchapters applicable to marine safety and vessel inspection:

Title 46 CFR		
Subchapter	**Part**	**Subject**
A	1-9	Procedures Applicable to the Public
B	10-16	Merchant Marine Officers and Seamen
C	24-29	Uninspected Vessel
D	30-40	Tank Vessels
E	42-46	Load Lines
F	50-64	Marine Engineering
G	66-69	Documentation and Measurement of Vessels
H	70-89	Passenger Vessels
I	90-106	Cargo and Miscellaneous Vessels
I-A	107-109	Mobile Offshore Drilling Units
J	110-113	Electrical Engineering
K	114-122	Small Passenger Vessels Carrying More Than 150 Passengers or with Overnight Accommodations for More Than 49 Passengers
L	125-139	Offshore Supply Vessels
N	146-149	Dangerous Cargoes
O	150-155	Certain Bulk Dangerous Cargoes
Q	159-165	Equipment, Construction and Material: Specifications and Approval
R	166-169	Nautical Schools
S	170-174	Subdivision and Stability
T	175-187	Small Passenger Vessels
U	188-196	Oceanographic Research Vessels
V	197-198	Marine Occupational Safety and Health Standards
W	199	Lifesaving Appliances and Arrangements

Title 33 CFR		
Subchapter	**Part**	**Subject**
A	19	Waivers of Navigation and Vessel Inspection Laws and Regulations
D	80	Navigation Rules
H	105	North Atlantic Passenger Routes
N	140-147	Outer Continental Shelf (OCS) Activities
O	151-159	Pollution
P	160	Ports and Waterways Safety

Title 49 CFR		
Subchapter	**Part**	**Subject**
C	171-179	Hazardous Materials Regulations

2. U.S. Code (USC), Titles 33, 46 and 50 The OCMI should also maintain current copies of Titles 33, 46 and 50 U.S. Code. Current year copies of the CFR should be available for inspectors to use in performing their duties. The following is a list of significant sections of Titles 33, 46 and 50 U.S.C. applicable to marine safety and vessel inspection:

Title 46 U.S.C.	
Site	**Subject**
46 U.S.C. 5101 – 5116	Load line requirements for foreign vessels.
46 U.S.C. 2101(12), 3306(a)(5) and 49 U.S.C. 1801 -1812	Safety requirements for carriage of dangerous articles and substances aboard foreign vessels.
46 U.S.C. 2101(12), (21) and (35), 3504 and 3505	Safety requirements for foreign vessels carrying passengers from any U.S. port to any other place or country.
46 U.S.C. 2101(12), (21), (22) and (35), and Chapter 35	Inspection and certification requirements for all foreign passenger vessels which embark passengers at and carry them from a U.S. port. These statutes are also relevant for vessels having valid SOLAS 74/78 Certificates or Canadian Certificates of Inspection, that must be examined to verify compliance with the flag administration's safety verification requirements.
46 U.S.C. 2101(12) and (39), 3301(10) and Chapter 37	Safety requirements that apply, with certain stipulations, to all foreign vessels regardless of tonnage, size, or manner of propulsion, whether or not carrying freight or passengers for hire, that enter U.S. navigable waters while carrying liquid bulk cargoes that are: a. Flammable or combustible; b. Oil of any type or in any form, including petroleum, fuel oil, sludge, oil refuse and oil mixed with wastes, except dredged spoil; c. Designated as a hazardous substance under Section 311(b) of the Federal Water Pollution Control Act (FWPCA) (33 U.S.C. 1321); or d. Designated as hazardous materials under Section 104 of the Hazardous Materials Transportation Act (HMTA) (49 U.S.C. 1803).
46 U.S.C. 2101(21) and 3304	Permission for U.S. vessels transporting cargo to carry a limited number of individuals without being considered a "passenger vessel" for most inspection purposes, and extension of this privilege to cargo vessels of those nations that accord reciprocal treatment.
46 U.S.C. 2101(33) and 3301(7)	Directs that safety requirements of 46 U.S.C. Chapter 33 are applicable to seagoing motor vessels of 300 or more gross tons.
46 U.S.C. 2101(35) and 3301(8)	Safety requirements for foreign small passenger vessels carrying more than six passengers from a U.S. port.

Title 33 U.S.C.	
Site	**Subject**
33 U.S.C. 1221-1232	Statutes for advance notice of arrival and navigation safety regulations.

Title 50 U.S.C.	
Site	**Subject**
50 U.S.C. 191	Requirements for security of vessels, harbors and waterfront facilities, and provision for control of the movement of foreign vessels in U.S. waters by the local OCMI/COTP (See Volume VI of this manual).

C. BOUNDARY LINE AND TERRITORIAL SEA.

1. Boundary Lines

a. 46 U.S.C. 3301(6) and (7) require inspection of seagoing barges and motor vessels whose definitions in 46 U.S.C. 2101(32) and (33) rely on the use of the Boundary Line;

b. 46 U.S.C. 5102(b)(6) exempts the load line statutes from applying to a U.S. vessel engaged in coastwise voyages that do not cross the Boundary Line, except a voyage on the Great Lakes;

c. 46 U.S.C. 8304 limits the application of the Officers Competency Certificate Convention, Geneva, 1936, to the *high seas,* defined as being "seaward of the Boundary Line";

d. The vessel Bridge-to-Bridge Radiotelephone Act (33 U.S.C. 1201 et. seq.) requires the carriage of radiotelephones on board certain vessels inside the Boundary Line on the navigable waters of the U.S. (i.e., inside the 3-mile limit);

e. 33 U.S.C. 152 limits the length of towing hawsers when operating inside the Boundary Line; and

f. 46 U.S.C. 3302(d) exempts certain vessels that operate inside the Boundary Line within the waters of southeastern Alaska and the State of Washington from inspection requirements. In addition to the above, the "Commercial Fishing Industry Vessel Safety Act of 1988" (46 U.S.C. 4502(b)) requires the carriage of safety equipment by certain uninspected commercial fishing industry vessels when operating beyond the Boundary Line.

NOTE: The U.S. Boundary Lines are specified in 46 CFR Part 7 and are used to determine the applicability of the six statutes listed under 46 CFR 7.1, summarized in this section.

2. U.S. Territorial Sea

a. On 28 December 1988, the President of the United States, by virtue of his foreign relations authority and consistent with international law, proclaimed a 12 nautical mile territorial sea. The proclamation did not extend the contiguous zone. The U.S. territorial sea extension applies to waters adjacent to the coasts of the Commonwealth of Puerto Rico, Guam, American Samoa, U.S. Virgin Islands, Commonwealth of the Northern Mariana Islands and any other territory or possession over which the U.S. exercises sovereignty.

b. Effect Upon Coast Guard Enforcement Activities. The proclamation extended the territorial sea only for international purposes and does not alter Coast Guard law enforcement activities. Existing Federal and State laws are not changed. The statutory definitions and applications of jurisdictional terms such as "territorial seas," "territorial waters," "navigable waters," and other similar terms remain unchanged unless legislation is enacted to change a specific law. For the purposes of enforcing U.S. domestic laws, the U.S. territorial sea remains 3 nautical miles, the outer limit of the U.S. contiguous zone remains 12 nautical miles, and the meaning of U.S. customs waters is unchanged. Accordingly, congressional action is necessary to extend the geographic application of a State or Federal law beyond 3 nautical miles.

D. INTERNATIONAL CONVENTIONS AND TREATIES RELATED TO MARINE INSPECTION TO WHICH THE U.S. IS PARTY

The International Maritime Organization (IMO) is a specialized agency of the United Nations concerned solely with maritime affairs. There are approximately 160 member nations in IMO, including the United States. IMO is responsible for international conventions, treaties, and resolutions to improve maritime safety. The organization consists of an Assembly, a Council, a Secretariat, and five specialized committees. The committee that proposes standards for steering and other technical matters is the Maritime Safety Committee, which meets twice a year. Countries that are party to international conventions and treaties, including the following, are listed in MSM Volume 1, Chapter 11.

➔ See MSM II, Section E for information on specific International Conventions, Treaties, Standards, and Regulations.

1. International Convention For The Safety Of Life At Sea (SOLAS), 1974

a. This Convention became binding upon the U.S. on 25 May 1980. It contains standards and procedures affecting the inspection of certain passenger vessels and cargo vessels making international voyages. The 1978 Protocol to SOLAS 74, adopted by the International Conference on Tanker Safety and Pollution Prevention, modified the original Convention and became effective on 1 May 1981; together they are known as SOLAS 74/78.

b. Convention Requirements. For the most part, the inspection requirements of the Convention, with the exception of radio equipment, have been or are in the process of being incorporated into Title 46, CFR. In determining the intent of a particular regulation, a thorough knowledge of the Convention's terms is essential. Additional guidance on this Convention is contained in chapters E2, D1 and D7 of this volume.

2. International Load Line Convention (ICLL), 1966

a. General. This Convention, which has been incorporated into Title 46 CFR, Subchapter E, contains standards for determining loading limits for vessels, the structure of vessels, protection of openings, guard rails, freeing ports, and means of access to crew's quarters. The requirements of this Convention are administered by the American Bureau of Shipping (ABS) for the Coast Guard; other assigning authorities have not been approved by the Commandant except for uninspected fish processing vessels.

The responsibilities of the OCMI and inspection personnel are described in volume IV of this manual.

Vessel Load Line Amendments of 1986

b. Vessel Load Line Amendments of 1986.

(1) A double standard has existed since 1968 when the ICLL changed to a length criterion of 79 feet while the Coastwise Act remained based on a tonnage criterion of 150 gross tons. On 21 October 1986, the Omnibus Reconciliation Act of 1986 (Public Law 99-509) was enacted which included provisions to revise and consolidate laws related to load lines. The new law brings all vessels under the requirements of the International Voyage Load Line Act of 1973, except in those cases where doing so would subject a vessel to additional requirements not justified for reasons of safety. It is for this reason that the public is being given ample opportunity to address implementation of the new law as it may impact on the provisions of existing regulations and policies. Although certain existing provisions may appear to be eliminated by the new law, many could be continued under the special exemptions provision under 46 U.S.C. 5108.

(2) The new law applies to ships 79 feet or more in length for both international and domestic voyages, a change from the 150 gross ton criterion for domestic voyages. Vessels of 79 feet or more in length on international voyages have been required to have a load line since 1968. "New" vessels on domestic voyages which are under 150 gross tons but 79 feet or more in length may be assigned a load line, but are not required to have one until the implementing regulations are promulgated. "Existing" vessels on domestic voyages continue to be subject to load line requirements based on tonnage.

(3) Until the regulations are amended to conform to the new law, the existing regulations will continue in effect. Policies based on these regulations or the old law that have been previously published either in this manual or elsewhere will also remain in effect. Additionally, existing limited domestic voyage approvals allowed by local policy, whether or not they are currently in the regulations, may continue in effect. When the new regulations are promulgated and in effect, all vessels on domestic voyages which were built after 1 January 1986 will have to comply with the load line requirements except as specifically exempted. Any existing policies that are discontinued by the rulemaking could, under the new law, also result in certain requirements being applied retroactively to existing vessels. Questions regarding load line application and enforcement should be directed to Commandant (G-MOC-2).

3. International Convention for the Prevention of Pollution from Ships, 1973 as modified by the 1978 Protocol (MARPOL 73/78)

a. General. The principal object of MARPOL is the protection of the marine environment from pollution arising from the deliberate, negligent, or accidental release of oil and other harmful substances. Most of the technical measures, including the requirements for vessels and reception facilities, are included in five annexes to this Convention, as follows:

(1) Annex I - Oil;

(2) Annex II - Noxious Liquid Substances Carried in Bulk (e.g., chemicals);

(3) Annex III - Harmful Substances Carried in Packages;

(4) Annex IV - Sewage; and

(5) Annex V - Garbage.

Annexes I and II

b. Annexes I and II. The Act to Prevent Pollution From Ships (33 U.S.C. 1901 et seq.) is the implementing U.S. legislation for MARPOL and Annexes I and II. Annex I entered into force on 2 October 1983 and Annex II entered into force on 6 April 1987.

Annexes III through V

c. Annexes III through V. These are optional, i.e., a government may, at the time of acceding to or ratifying the Convention, declare that it does not accept any or all of these Annexes. The U.S. has accepted Annex V and it came into force on 31 December 1988, and Annex IV is not yet in force.

4. International Regulations for Preventing Collisions at Sea, 1972 (COLREGS)

These are published in COMDTINST M16672.2, Navigation Rules, International - Inland. They prescribe the basic rules that control the behavior of vessels at sea to prevent collisions. Questions concerning the navigation rules should be directed to Commandant (G-MW).

5. International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969

This Convention affirms the right of a coastal nation to take all necessary measures on the high seas to prevent or mitigate the danger to its coastline or related interest from pollution by oil, or the threat thereof, following a maritime casualty. Such actions may be taken only after due consultation with appropriate interests, including the flag state(s) of the ship(s) involved, the owners of the ship(s) or cargoes in question, and, when circumstances permit, independent experts appointed for this purpose. No interventions can be conducted by marine safety personnel without the specific approval of the Commandant. A coastal nation that exceeds these measures is liable to pay compensation for any damages caused by its unilateral actions. The Convention contains provisions for the settlement of disputes through negotiation, conciliation, and arbitration. For further guidance consult COMDINST M16451.5 (series).

6. International Convention for Safe Containers, 1972

This Convention seeks to maintain a high level of safety of human life in the transport and handling of cargo containers, while facilitating their international use in intermodal transportation.

7. Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972

This Convention, commonly known as the "London Dumping Convention," promotes the effective control of all sources of marine pollution. It tasks nations that are party to it to take all practical steps to prevent pollution from dumping wastes and other matter liable to create hazards to human health, to harm living resources and marine life, or to interfere with other legitimate uses of the sea. The Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA, 33 U.S.C. 1401 et seq.) was amended on 22 March 1974 to reflect the provisions of this Convention. It prohibits or controls the dumping of wastes and other matter, in whatever form or condition, as follows:

a. The dumping of wastes or other matter listed in Annex I of the Convention is prohibited;

b. The dumping of wastes or other matter listed in Annex II requires special prior permission; and

c. In times of emergency, usually prohibited dumping may occur to secure the safety of lives, vessels, aircraft, or structures at sea.

8. Officers' Competency Certificates Convention, 1936

Every nation that is party to this Convention must establish minimum requirements of professional capacity for the master, chief engineer, and navigating and engineering officers in charge of watches aboard merchant vessels of that country, and must issue certificates of competency to qualified officers. This Convention has been implemented by statute and regulation in 46 U.S.C. 8304 and 46 CFR 15.701, respectively, for vessels of 200 gross tons or more.

9. Certification of Able Seaman Convention, 1946

This Convention requires persons serving as able seamen aboard merchant vessels of nations party to this Convention to be qualified to perform any duty in the deck department, and to possess certificates of qualification granted in accordance with the provisions of the Convention.

10. STCW 95

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended in 1995 (STCW 95) was adopted on 07 July 1995 and entered into force internationally on 01 February 1997. The major highlights of the 1995 amendments include the following: Creation of the STCW Code, changes in tonnage limitations, certification and endorsements, rest periods, English proficiency, basic safety training, vessel familiarization, and company responsibility

NOTE: See MSM II D2.D.1.(d) and E for guidance on exercising control under STCW Article X, and Regulation 1(4) and NVIC 3-98 for guidance on the '95 amendments.

11. ILO 147

International Labor Organization (ILO) Convention No. 147, The Convention concerning Minimum Standards in Merchant Ships (ILO 147) was adopted at the 62nd session of the International Labor Conference on 13 October 1976, under the auspices of ILO. It entered into force internationally on 28 November 1981; upon the United States' deposit of its instrument of ratification, it entered into force on 15 June 1989. ILO 147 serves as an "umbrella" convention for 15 other ILO conventions concerning a variety of maritime related health, welfare and workplace safety issues. ILO 147 concerns three basic areas: safety standards including standards of competency, hours of work and manning; appropriate social security matters; and, shipboard conditions of employment and shipboard living arrangements. A guidebook, Inspection of Labour Conditions on Board Ship: Guidelines for Procedure (ISBN 92-2-107096-4), may be obtained from ILO Publications, The International Labour Office, CH-1211, Geneva 22, Switzerland.

NOTE: See MSM II D2.D.1.(e) for guidance on exercising control under ILO 147 Article 4 and COMDTINST 16711.12.

E. PURPOSE OF MARINE SAFETY MANUAL, VOLUME II

1. Responsibility of the Marine Inspector

It is neither necessary nor possible to memorize the multitude of laws and regulations that the Coast Guard must enforce. It is, however, incumbent upon, and the responsibility of, the marine inspector to have a working knowledge of both U.S. and international laws and regulations so that he/she can recognize a deficiency when one occurs, or can quickly locate the statutory cite relating to a particular requirement.

2. Content

The following chapters contain information and policy intended to promote consistent and uniform interpretation and application of U.S. and international laws and regulations as they relate to merchant vessel inspections. This information generally does not restate requirements that are specifically and clearly covered in the law, Federal regulations or international conventions. Neither are the regulations and the guidance contained in this volume intended to cover all contingencies that may be encountered during vessel inspections. There is no substitute for experience and common sense to ensure that good marine practice is being followed. In addition, any information in this volume may be supplemented, altered, or waived in specific cases by the Commandant, district commander, or OCMI. To that end, it is imperative that the OCMI maintain a current and complete library containing the applicable laws and regulations.

3. Other Guidance

This volume must be used in conjunction with other applicable instructions, notices, and publications such as Commandant Instructions, Law Bulletins, and Navigation and Vessel Inspection Circulars (NVIC's). At the end of this chapter is a list of recommended reference material to further supplement information upon which the inspector may draw.

4. Index

The index at the end of this volume is a detailed cross reference between various subjects and applicable sections of this manual, NVIC's, and other instructions that provide guidance for the marine inspector.

F. VESSEL INSPECTION POLICY

1. Inspections

Vessel inspection policy is developed with the intention of protecting individuals, their private property, and the marine environment from the consequences of incidents involving materially unsafe vessels. Inspections of vessels are generally made while they are not engaged in navigation; however, at times it is more conducive to vessel owners and operators to schedule an in-water inspection, such as an inspection for certification or midperiod inspection, during a leg of a vessel's voyage. OCMI's should take advantage of underway inspections as they allow the inspector to witness the operation of a vessel's machinery and other equipment, as well as observing the conduct of the licensed crew. The inspection of a vessel is intended to determine its reasonable, probable compliance with published minimum safety standards over a projected period of time. The issuance of a Certificate of Inspection (COI) attests to that reasonable probability.

2. Coast Guard Concerns

The Coast Guard's objective is to administer vessel inspection laws and regulations so as to promote safe, well-equipped vessels that are suitable for their intended service. It is not the Coast Guard's intent to place unnecessary economic and operational burdens upon the marine industry. In determining inspection requirements and procedures, inspection personnel must recognize and give due consideration to the following factors:

a. The burden for proposing acceptable repairs rests upon the vessel's owner, not upon the repair facility or the inspector;

b. Delays to vessels, which can be costly, need to be balanced against the risks imposed by continued operation of the vessel, with safety of life, property, and the environment always the predominant factor over economics;

c. Certain types of construction, equipment, and/or repairs are more economically advantageous to the vessel operator and can provide the same measure of safety;

d. Some repairs can be safely delayed and can be more economically accomplished at a different place and time;

e. The overall safety of a vessel and its operating conditions, such as route, hours of operations, and type of operation, should be considered in determining inspection requirements;

f. Vessels are sometimes subject to operational requirements of organizations and agencies other than the Coast Guard; and

g. A balance must be maintained between the requirements of safety and practical operation. Arbitrary decisions or actions that contribute little to the vessel's safety and tend to discourage the construction or operation of vessels must be avoided.

3. Appeals Decisions made by the OCMI, the American Bureau of Shipping when acting on behalf of the Coast Guard, and the Marine Safety Center may be appealed by the affected party, as described in 46 CFR 1.03. Efforts should always be made first at the local level with the responsible office to resolve any disagreements. If agreement cannot be reached, then a written appeal is the next step, and should follow the appropriate route as indicated.

G. APPLICABLE TANK VESSEL REQUIREMENTS

When combustible and flammable cargoes are carried in bulk, those portions of the vessel used for the carriage of these cargoes must also meet the requirements of Subchapter D (tank vessels). The following portions of Subchapter D apply to all vessels, if Grade D and above products are carried:

1. 46 CFR 32.45 Electrical Installations	Refer to 46 CFR 32.45: Electrical Installations.
2. 46 CFR 32.50 Pumps, Piping, and Hose for Cargo Handling	Refer to 46 CFR 32.50: Pumps, Piping, and Hose for Cargo Handling.
3. 46 CFR 32.55 Ventilation and Venting	Refer to 46 CFR 32.55: Ventilation and Venting.
4. 46 CFR 32.60 Hull Requirements for Tank Vessels on or After July 1, 1951	Of special significance are cargo piping and pump room requirements. Cargo piping must comply with 46 CFR 32.50-15(a)(1), and (3)(b) and (c). Cargo piping may not pass through machinery spaces. Combining this with the requirements of 46 CFR 32.60-20(a) will necessitate a separate space for the cargo pump. The equipment in this space must comply with 46 CFR 32.45 and 111.105-31. A hazardous area drawing in accordance with 46 CFR 111.20-1(k) will be required.

H. REQUIRED PUBLICATIONS

Chapter 2 of the Directives, Publications and Reports Index (DPRI)(COMDTNOTE 5600) lists the effective publications required for marine safety units, as well as a list of effective periodicals.

I. RECOMMENDED REFERENCES

In addition to the publications listed in the DPRI, OCMI's should obtain copies of pertinent international conventions and standards, industry standards and technical publications deemed necessary for reference and the proper training of personnel. Sufficient numbers and varieties of these publications should be obtained to keep inspection personnel abreast of developments in ship operation, construction, repair, etc. The following list of publications is considered to be good reference and training material, and may be modified to suit the individual needs of a unit. In light of the Coast Guard's increasing acceptance of industry developed standards, special emphasis should be placed on obtaining the specific standards listed either in the regulations or below.

1. A Guide to the Non-Destructive Testing of Non-Butt Welds in Commercial Ships, Parts I and II, Ship Structure Committee (SSC).
2. A Guide to Sound Ship Structures, D'Archangelo.
3. American National Standards Institute (ANSI) Steel Pipe Flanges and Flanged Fittings, ANSI B.16.5, American Society for Testing and Materials (ASTM).
4. ANSI Standard for Steel Valves, ANSI B.16.34, ASTM.
5. ANSI Standards for Power Piping, ANSI B.31.1, ASTM.
6. Approved Welding Electrodes, Wire-Flux and Wire Gas Combinations, American Bureau of Shipping (ABS).
7. ASME Boiler and Pressure Vessel Code, The American Society of Mechanical Engineers (ASME).
8. ASTM Standards:
   - F-1121-88, International Shore Connections for Marine Applications
   - F-1122-88, Quick Disconnect Couplings
   - F-1196-88, Sliding Watertight Door Assemblies
   - F-1197-88, Sliding Watertight Door Control Systems
   - F-XXX1, Spill Valves for Use in Marine Tank Liquid Overpressure
   - Protection Applications
   - F-XXX2, Tank Vent Pressure-Vacuum Relief Valves
   - F-XXX3, Tank Vent Flame Arrestors
   - F-XXX4, Tank Vent Flame Screens
9. Boilerworker First and Chief, Bureau of Naval Personnel (NAVPERS) 10537, U.S. Navy.
10. Carbon Dioxide Extinguishing Systems, NFPA-12, National Fire Protection Association (NFPA).

11. Code for the Construction and Equipment of Mobile Offshore Drilling Units (MODU Code), IMO Resolution A.414(XI).

12. Care of Fire Hose, NFPA-198, NFPA.

13. Code of Safety for Dynamically Supported Craft, IMO.

14. Code of Safety for Diving Systems, IMO.

15. Code of Safety for Special Purpose Ships, IMO Resolution A.534(13).

16. Considerations for the Prevention of Furnace Explosions and Superheater Damage in Merchant Ship Boilers During Light-Offs, T&R R-23, the Society of Naval Architects and Marine Engineers (SNAME).

17. Control of Gas Hazards on Vessels to be Repaired, NFPA-306, NFPA.

18. Dangerous Properties of Industrial Materials, Sax.

19. Defects and Failures in Pressure Vessels and Piping, Helmut Thielsch. Reinhold Publishing Corp., New York.

20. Dry Chemical Extinguishing Systems, NFPA-17, NFPA.

21. Engineering Materials Handbook, Mantell. McGraw-Hill Book Co., New York.

22. Fiberglass Boat Design and Construction, Scott and DeGraff.

23. Fiberglass Boats, DuPlessis and DeGraff.

24. Fire Hose Coupling Screw Threads, NFPA-194, NFPA.

25. Fire Protection of Vessels During Construction, Repair and Lay-Up, NFPA-312, NFPA.

26. Flammable Liquids Code, NFPA-30, NFPA.

27. Flash Point Index of Trade Name Liquids, NFPA-325A, NFPA.

28. Foam Extinguishing Systems, NFPA-11, NFPA.

29. General Information for Grain Loading, International Cargo Gear Bureau, Inc.

30. Guide for Construction of Shipboard Elevators, ABS.

31. Guide for Container Equipment Inspection, Institute of International Container Lessors, Ltd.

32. Guide for Inert Gas Installations on Vessels Carrying Oil in Bulk, ABS.

33. Guide for Repair, Welding, Cladding and Straightening of Tail Shafts, ABS.

34. Guide for Centralized Control and Automation of Ship's Steam Propulsion Plant, T&R R3-23, SNAME.

35. Guide for Shipboard Centralized Control and Automation, ABS.

36. Guide for Steel Hull Welding, American Welding Society (AWS).

37. Guide for Underwater Inspection in Lieu of Drydocking Survey, ABS.

38. Guidelines for the Design and Construction of Offshore Supply Vessels.

39. Halon 1301, National Fire Prevention Association, NFPA-12A, NFPA (1987).

40. Handbook of Ship Calculations, Construction and Operation, Hughes.

41. Handbook of Test Methods and Practices, Naval Ship Systems Command (NAVSHIPS) 918828, U.S. Navy.

42. Handbook of Wooden Boat Construction, Chapelle.

43. Handbook on Sanitation of Vessel Construction, PHS No. 393, U.S. Public Health Service (USPHS).

44. Handbook on Sanitation of Vessels in Operation, PHS No. 68, USPHS.

45. Inert Gas Systems, IMO Publication, 1983 Edition, Reprinted 1987.

46. Inspection Manual, NFPA.

47. International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code). The IBC Code is mandatory under both Chapter VII of SOLAS and Annex II of MARPOL 73/78 for chemical tankers constructed on or after 1 July 1986.

48. International Gas Carrier (IGC) Code. The IGC Code is mandatory under Chapter VII of SOLAS for gas carriers constructed after 1 July 1986.

49. Bulk Chemical (BCH) Code. The BCH Code is mandatory under Annex II of MARPOL 73/78 for chemical tankers constructed before 1 July 1986.

50. International Convention for Safe Containers, IMO.

51. International Safety Guide for Oil Tankers and Terminals (ISGOTT), 3rd Edition, International Chamber of Shipping.

52. Introduction to Steel Shipbuilding, Baker.

53. Lloyd's Register of Shipping Rules and Regulations for the Classification of Yachts and Small Craft (Lloyd's Rules).

54. Manual of Safe Practices in Offshore Operations, Offshore Operations Committee.

55. Marine Chemists Directory (current year), NFPA.

56. Marine Design Manual for Fiberglass Reinforced Plastics, McGraw-Hill.

57. Marine Engineering, Harrington. SNAME, 1971.

58. Marine Engineers Handbook, Lamberton and Marks.

59. Modern Ships, John M. LaDage. Cornell Maritime Press.

60. National Electrical Code, NFPA-70, NFPA.

61. National Electrical Safety Code, Handbook H 30, National Bureau of Standards, U.S. Department of Commerce.

62. Nondestructive Testing Handbook, Vol. I and II, R. C. McMaster, ed. The Society for Nondestructive Testing; Roland Press.

63. Personnel Qualification and Certification in Nondestructive Testing, Recommended Practice No. SNT-TC-1A, American Society for Nondestructive Testing.

64. Pleasure and Commercial Motor Craft, NFPA-302, NFPA.

65. Portable Fire Extinguishers, NFPA-10, NFPA.

66. Principles of Magnetic Particle Testing, Betz.

67. Principles of Naval Architecture, SNAME.

68. Principles of Penetrants, Betz.

69. Provisional Rules for the Approval of Filler Metals for Welding Higher Strength Steels, ABS.

70. Radiographs of Welds, International Institute of Welding (IIW).

71. Recommended Practice for Electrical Installations on Shipboard, Standard No. 45, Institute of Electrical and Electronic Engineers (IEEE).

72. Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk, Annex II of MARPOL 73/78.

73. Requirements for Radiographic Inspection of Hull Welds, ABS.

74. Requirements for the Certification of the Construction and Survey of Cargo Gear on Merchant Vessels, ABS.

75. Requirements for the Certification of the Construction and Survey of Self-Unloading Cargo Gear on Great Lakes Vessels, ABS.

76. Rules and Regulations for the Classification of Yachts and Small Craft, Lloyd's Register of Shipping.

77. Rules for Building and Classing Aluminum Vessels, ABS.

78. Rules for Building and Classing Bulk Carriers for Service on the Great Lakes, ABS.

79. Rules for Building and Classing Mobile Offshore Drilling Units, ABS.

80. Rules for Building and Classing Reinforced Plastic Vessels, ABS.

81. Rules for Building and Classing Steel Barges for Offshore Service, ABS.

82. Rules for Building and Classing Steel Vessels, ABS.

83. Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways, ABS.

84. Rules for Building and Classing Steel Vessels Under 61 Meters, ABS.

85. Rules for Building Wooden Hulls, ABS.

86. Rules for Nondestructive Inspection of Hull Welds, ABS.

87. Safety and Health In Dock Work - Code of Practice, The International Labor Organization (ILO).

88. Safety Code for Elevators, Dumbwaiters and Escalators, ANSI.

89. Safety Manual for Marine Oil-Fired Watertube Boilers, The National Safety Council.

90. Safety of Life At Sea (SOLAS 48, 60 and 74), IMO.

91. Ship Design and Construction, SNAME, 1980.

92. Ship to Ship Transfer Guide (Petroleum), International Chamber of Shipping/Oil Companies International Marine Forum.

93. Ship to Ship Transfer Guide (Liquefied Gases), International Chamber of Shipping/Oil Companies International Marine Forum.

94. SOLAS 74/83, Consolidated Text.

95. SOLAS 74, 1983 Amendments, Vol. III (IGC Code).

96. SOLAS 74, 1988 and 1989 Amendments.

97. Specifications by the American Society for Testing and Materials (All Parts), ASTM.

98. Standard Marking System for Valves, Fittings, Flanges and Unions, MSS-SP 25, The Manufacturers Standardization Society (MSS).

99. Standards for the Installation of Sprinkler Systems, NFPA-13, NFPA.

100. Standards for Marine-Type Electric Lighting Fixtures, Subject 595, Underwriters Laboratories, Inc. (UL).

101. Standards and Recommended Practices for Small Craft, American Boat and Yacht Council, Inc., (ABYC).

102. Standards of the American Welding Society, (AWS).

103. Standards of the Compressed Gas Association, (CGA).

104. Standards of the Marine Department, Underwriters Laboratories, Inc.

105. Standards of the Tubular Exchanger Manufacturers Association, (TEMA).

106. Static Electricity, NFPA-77, NFPA.

107. Steel Construction Manual, The American Institute of Steel Construction.

108. Storage and Handling of Liquefied Petroleum Gases, NFPA-58, NFPA.

109. Tanker Handbook for Deck Officers, C. Baptist.

110. Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment, (Annual) American Conference of Governmental Industrial Hygienists.

111. United States Code Annotated, Title 46.

112. Welding Handbook, Sections 1-5 (latest editions), AWS.

113. Wire Rope and Strand, Federal Specification RR-W410C.

114. X-Ray Standards for Production and Repair Welds, NAVSHIPS 250-692-2, U.S. Navy.

NOTE: Various maintenance manuals published by the manufacturers of boilers, turbines, aluminum components, etc., are also useful resources.

J. MARITIME ADMINISTRATION (MARAD)

The Merchant Marine Act of 1936 (46 App. U.S.C. 1101 et seq.), as amended by the Merchant Marine Act of 1970, states that it is the national policy to foster the development and encourage the maintenance of a merchant marine. The agency charged with implementing this policy is MARAD. In September 1981, MARAD became an agency of the Department of Transportation (DOT). Liaison between MARAD and the Coast Guard is intended to promote attainment of the mutual goal of merchant vessel safety.

K. HAZARDOUS MATERIAL DETERMINATIONS AND AUTHORITY

A liquid hazardous material is defined in 46 U.S.C. 2101. Regulation of combustible and flammable liquids falls under either or both of the following statutes:

➔ See MSM II, Section F for more greater detail on issues involving the carriage of hazardous materials.

1. HazMat Transportation Act (HMTA) of 1974

Hazardous Materials Transportation Act (HMTA) of 1974 (49 U.S.C. 1801-1812). For "packaged" material, the HMTA defines a "hazardous material" as "a substance or material that has been determined by the Secretary of the Department of Transportation (SECDOT) to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated" (see 49 CFR 171.8). This is a very broad definition, in that it includes many commodities that may not be allowed for shipment in bulk.

2. 46 USC 2101

For the purpose of "bulk" transportation, Title 46 U.S.C. defines a "hazardous material" as any liquid material or substance that is:

a. Flammable or combustible;

b. Designated a hazardous substance under Section 311(b) of the Federal Water Pollution Control Act (FWPCA), as amended (33 U.S.C. 1321); or

c. Designated a hazardous material under Section 104 of the HMTA (49 U.S.C. 1803).

TABLE OF CONTENTS

CHAPTER 2: ADMINISTRATION OF MERCHANT VESSEL INSPECTIONS

A. ASSIGNMENT OF MARINE INSPECTORS

1. Introduction

Many factors have a bearing on the number of inspectors that are assigned to any one inspection. The number and technical qualifications of inspectors necessary to conduct an adequate inspection or examination is at the discretion of the OCMI. One inspector (either deck or engineering) is usually sufficient to inspect small vessels such as tank barges, seagoing barges, or small passenger vessels. Larger vessels or those requiring an accelerated inspection may require two inspectors (deck and engineering) and perhaps more, as the need arises.

2. Training and Experience

Inspectors are considered either deck or engineering inspectors. The OCMI should ensure that all inspectors are cross-trained, within the limits of their capabilities, to serve in both capacities. Thus, an engineering inspector will normally be expected to be capable of making examinations such as the checking of repairs to a lifeboat. A deck inspector will likewise be expected to be capable of making simple engineering examinations, such as checking a fire pump.

3. Overseas Inspections

There has been a vast expansion of repair and construction of U.S. vessels overseas in recent years. As a result, we are routinely being asked to conduct inspections in overseas locations where our inspectors may be exposed to potential threats to their physical security. Coast Guard inspectors are easily identified as Americans and, if identified as Coast Guard officers, easily associated with the military. Although we have a responsibility to U.S. ship owners, operators, and seafarers in carrying out our commercial vessel safety mission, we also have a responsibility for addressing the safety of our people. OCMIs must also keep in mind the potential impact that overseas inspection decisions may have on both local and national policy. Commanding Officers of the Marine Safety Units (MSOs, MIOs, Activities, etc.) should follow the procedures outlined below when responding to requests for overseas inspections.

Requests for Overseas Inspections

a. Requests for overseas inspections should be routed sufficiently high within each office to address the policy issues involved. Requests that are general in nature (that is, simply inquiring whether the Coast Guard is sending inspectors into certain areas), should be answered carefully to ensure that a general response does not include a statement that the Coast Guard is not traveling to a particular country. This can and has caused political consternation both within our government and with foreign governments. Responses to this type of request should contain statements to the effect that no general Coast Guard travel bans exist and that inspector availability and assessment of the threat to personnel is done on a specific case-by-case basis.

Threat Assessment

b. When considering requests to conduct inspections of specific ships or in specific areas, the latest threat assessments should be reviewed. These can be obtained from district (oil), or by contacting the International Affairs Office at Coast Guard Headquarters. The State Department also issues travel advisories for U.S. citizens. The Citizens Emergency Center at the State Department in Washington, D.C. provides general information on possible danger areas for U.S. citizens around the world. They may be contacted at (202) 647-5225.

Message Notification

c. If a preliminary decision is made to send an inspector overseas, then the OCMI shall request country clearance from the cognizant U.S. Embassy or Consulate by message in accordance with COMDTINST 5000.5E. The message format and wording shall be as shown in Figure 2-1. The message shall include the name of the inspector, the dates of travel, the purpose of the travel, a statement regarding whether assistance by post officials is/is not envisioned, and the name, position title, and telephone number of a contact person.

FIGURE 2-1: SAMPLE COUNTRY CLEARANCE REQUEST MESSAGE

FROM: YOUR PLA

TO: AMEMBASSY (IN CAPITAL)

USDAO (IN CAPITAL)

INFO: AMCOUNSUL (IF NEAR TO DESTINATION)

APPROPRIATE UNIFIED COMMAND (SEE LIST BELOW)

COMDT COGARD WASHINGTON DC//G-CI/G-OIN/G-OIS//

COGARD INTELCOORDCEN WASHINGTON DC

COMLANTAREA OR COMPACAREA COMMANDER

DISTRICT COMMANDER

SECSTATE WASHINGTON DC

ACTEUR, FESEC, MARSEC, GANTSEC IF APPROPRIATE

UNCLAS//N05050// (NOTE: ALL COMMANDANT TRAVEL SHOULD BE "CONFIDENTIAL.")

SUBJ: COUNTRY CLEARANCE REQUEST FOR COAST GUARD PERSONNEL

IAW THE DOD FOREIGN CLEARANCE GUIDE, REQUEST CLEARANCE AS FOLLOWS:

A. CITIES AND COUNTRIES TO BE VISITED.

B. FULL NAME, GRADE, POSITION TITLE, AND SECURITY CLEARANCE OF VISITOR(S).

C. SPECIFIC PURPOSE OF VISIT. (INCLUDE WHETHER CLASSIFIED INFORMATION WILL BE DISCLOSED ANJD THE AUTHORITY FOR DISCLOSURE). (AVOID ACRONYMS. A FULL EXPLANATION IN EASILY UNDERSTOOD TERMS IS REQUIRED.)

D. DATE AND NATURE OF INVITATIONS ON WHICH VISIT IS BASED, IF APPROPRIATE.

E. PROPOSED ITINERARY, INCLUDING ESTIMATED DATES/TIMES OF ARRIVAL AND DEPARTURE AND MODE OF TRANSPORTATION AT EACH PLACE.

F. ALTERNATE VISIT DATE, IF VISIT CANNOT BE ACCOMMODATED AT PREFERRED TIME.

G. NAME, GRADE, AND POSITION TITLE OF KEY PERSONNEL TO BE VISITED.

H. LOGISTICAL/ADMINISTRATIVE SUPPORT REQUIRED, INCLUDING BILLETING AND GROUND/AIR TRANSPORTATION. (IF NONE REQUIRED, FOLLOWING STATEMENT SHOULD BE INCLUDED: "ALL ARRANGEMENTS FOR TRAVEL AND ACCOMMODATIONS ARE BEING HANDLED BY TRAVELER; NO POST ASSISTANCE IS ANTICIPATED").

I. NAME AND PHONE NUMBER OF CG POINT OF CONTACT.

J. COMPLETE EXPLANATION IF REQUEST DOES NOT MEET REQUIRED LEAD TIME.

K. INCLUDE THE FOLLOWING STATEMENT "WE WILL ASSUME THAT COUNTRY CLEARANCE IS GRANTED UNLESS A NEGATIVE REPLY IS RECEIVED" IN ALL MESSAGES WITH THE EXCEPTION OF MESSAGES TO AUSTRIA, BRAZIL, CUBA, FINLAND, LEBANON, NORTHERN IRELAND, PERU, RUSSIA AND SWEDEN. NOTE: THIS LIST MAY ALTER DUE TO POLITICAL CHANGES, CONSULT G-CI IF IN DOUBT.

FIGURE 2-1: SAMPLE COUNTRY CLEARANCE REQUEST MESSAGE (Cont.)

UNIFIED COMMAND LIST

USCINCLANT NORFOLK VA//J55// FOR CARIBBEAN

USCINCCENT MACDILL AFB FL// FOR MIDDLE EAST, EGYPT, HORN OF AFRICA AND PAKISTAN

USCINCEUR VAIHINGEN GF//ECJ4-SAA//FOR EUROPE (INCLUDING TURKEY, ISRAEL, LEBANON), AFRICA, RUSSIA

USCINCPAC HONOLULU HI//J5//FOR PACIFIC, AUSTRALIA, ASIA, INDIAN OCEAN COUNTRIES, RUSSIA

USCINCSO QUARRY HEIGHTS PM//SCCG//FOR CENTRAL AND SOUTH AMERICA

No Unified Command Notification Required for MEXICO or CANADA, *HOWEVER, PLEASE NOTE: Coast Guard personnel requesting clearance to Canada should address their request*

TO: AMEMBASSY OTTAWA//ECON//

INFO: USDAO OTTAWA CA

NOTE: Coast Guard Personnel are EXEMPT from obtaining DoD Special Area Clearance.

Overseas Examinations of Foreign Vessels

d. Title 46 U.S.C. Section 3317 authorizes the Coast Guard to be reimbursed for examinations of foreign vessels conducted at foreign ports or places at the request of the owner or managing operator of the vessel. Based on this authorization, the Coast Guard will conduct those overseas examinations on foreign vessels which will prove most beneficial to our Port State Control efforts while conserving time and resources. Activities which may warrant overseas travel include initial control verification exams of passenger vessels and examinations of other vessels of particular interest due to their unique design or type of cargo carried (e.g., liquefied gases). Most other foreign vessel exams will be conducted in U.S. ports. Field units which receive requests for overseas examinations of foreign vessels must contact Commandant (G-MOC-2) for approval. Commandant (G-MOC-2) will evaluate the request, and if approved, will coordinate/organize any augmentation teams necessary to assist the field unit to perform the examination.

Denial of Overseas Inspection Request

e. If a preliminary decision is made not to send an inspector, Commandant (G-MOC) should be notified before any further action is taken. Commandant (G-MOC) will contact the cognizant Coast Guard offices to ensure that all available information has been considered, and then advise the OCMI of any new information that bears on the preliminary decision. Responsibility for the final decision rests with the OCMI. Commandant (G-MOC) shall be advised of the final decision.

Inspector's Responsibilities

f. When traveling overseas, the inspector should make his own travel arrangements directly with transportation carriers. The use of foreign carriers is also permitted to obtain indirect routing around high risks areas. Under the Travel Charge Card Program, inspectors may be issued a Government-issued Credit Card, or they may use their own charge cards or other means of payment to facilitate overseas ticketing. Currently, these government-issued credit cards indicate that the holder is an employee of the U.S. Government. For this reason, inspectors should use discretion with this card. Cognizant OCMIs should ensure expeditious reimbursements of expenses with the district travel office in accordance with the JTR.

Reporting of Overseas Inspections

g. MSIS reports for inspections conducted overseas shall have the proper country code indicated in the appropriate field of the Marine Inspection Activity Report (MIAR).

4. Performance of Reimbursable Overtime by Civilian Marine Inspectors

Depending upon workloads and the availability of trained personnel, it may at times be necessary to assign civilian marine inspectors to duties that may involve the payment of overtime compensation.

Computation for Services

a. 46 U.S.C. 2111 is to be used for computing overtime compensation for services performed after hours, on Sundays and holidays. Saturdays are considered normal work days. Overtime, other than that specifically provided for in Title 46, is computed according to 5 U.S.C. 5542.

Reimbursements from Industry

b. Reimbursements from industry for overtime services by civilian inspectors are not to be viewed as an offset to the district's civilian overtime ceiling. 46 U.S.C. 2111 requires that overtime be paid to the employee out of annual appropriations and that reimbursements from industry be deposited in the U.S. Treasury. Rather than sidestepping the district's civilian overtime ceiling, the provisions of the statute will actually cause the overtime account to be drawn down more rapidly as payments to civilian documentation officers and inspectors are considerably more generous than those paid to other employees.

Availability of District Funding

c. Presently, there are no means by which the Coast Guard may recover the deposits of overtime reimbursements from the Treasury. This may create a problem when overtime funding is no longer available at the district level. Until a means is established to recover the reimbursements deposited in the Treasury to supplement the overtime ceilings, Commandant (G-MOC) should be contacted regarding the possibility of providing program funds to cover overtime expenses for the purpose of preventing any disruption in our services.

Assignment of Civilian Inspectors

d. OCMI's should exercise care in assigning civilian inspectors to ensure that the same companies are not repeatedly burdened with the extra cost while others escape the added expense altogether. This will avoid the appearance of unfairly treating any particular party. Also, a written acknowledgement must first be obtained from the vessel operators that they will reimburse the Government for overtime costs.

B. REGULATIONS

During the inspection of a vessel, care must be taken to ensure that each regulation being applied is relevant to the vessel and situation under consideration. In the application of regulations, situations will arise, especially with regard to new procedures and new products, in which the regulations seem to apply, but either don't or are not in the best interests of overall safety. Inspectors should be alert to such situations and should seek advice from the Senior Inspector of Materiel (SIM), Chief, Inspection Department (CID), or the OCMI before requiring changes based on such applications. Likewise, the OCMI, when in doubt, should ask advice from the district commander (or the Commandant, via the chain of command).

C. INSPECTION DEFICIENCIES

1. Definition

A "deficiency" is any failure to meet minimum requirements of the vessel inspection laws or regulations. The condition of material or equipment is considered deficient if:

a. It is presently unsatisfactory to the inspector; or

b. It has a reasonable possibility of becoming unsatisfactory prior to the next inspection for certification or the next required hull examination.

2. Notice of Deficiency Using Form CG-835

Introduction

a. If, during the course of any inspection or examination of a vessel, the vessel or its equipment is found not to comply with the requirements of vessel inspection laws or regulations, or is deficient as to condition, the inspector should point out all deficiencies and discuss all requirements with the vessel's owner or the owner's representative. When necessary, the inspector should explain that failure to fulfill the requirements before completion of the inspection or examination may result in refusal to issue or withdrawal of the vessel's COI. The owner/representative should also be advised that he or she may discuss, with the OCMI, any deficiency that is not expected to be corrected by the completion of the inspection or examination. The OCMI may then decide whether to permit the deficiency to remain outstanding. Deferment of correction of minor deficiencies may be settled by discussions between the owner/representative and the inspector when authorized by the OCMI. If the owner or his representative desires further clarification or reconsideration of any requirement, that person should consult the OCMI. Outstanding deficiencies, and any deficiencies corrected during the inspection that may have affected the seaworthiness of the vessel, or are of an unusual or complex nature that may indicate a problem with a system or item on other vessels, should be entered into the MSIS Marine Inspection Deficiency Report (MIDR) as soon as possible. Entering deficiencies corrected during the inspection utilizes the safety performance tracking capability afforded by MSIS.

Notification

b. When one or more deficiencies are found, the master of the vessel must be notified. The master and other officers having primary interest in the inspection, such as the chief mate or chief engineer, should be kept fully informed of all deficiencies found and requirements issued, even though a port engineer or other owner's representative may be directly concerned with correction of the deficiencies. Notification of the deficiency by the inspector may be given verbally or in writing, as circumstances dictate (see paragraph 2.C.3 below). Written notification to correct a deficiency should normally be on Form CG-835, Notice of Merchant Marine Inspection Requirements. The original copy of Form CG-835 should be issued to the vessel's master or, if not available, to either the chief engineer or the owner/representative. If issued to the owner or representative, that person's capacity with respect to the vessel (title), should be noted on the form.

Follow-Up on Requirements

c. It is important for the owner or the owner's representative to be informed of deficiencies as soon as possible after the inspection or examination has begun. In the case of spaces that must be inspected but are inaccessible, it is within the prerogative of the inspector to issue Form CG-835 requiring the opening of such spaces. Failure to do so by the vessel representative may delay the completion of the inspection or examination.

Pending Requirements

d. When a vessel other than a T-Boat is permitted to depart with outstanding deficiencies following an inspection, the inspector should make a brief entry on the Vessel Inspection Record, Form CG-2832, indicating the inspection requirements issued. The entry should be made in accordance with the instructions on the form. For all vessels, the inspector should then ensure that outstanding deficiencies, and any corrected deficiencies that may have directly affected the seaworthiness of the vessel, are entered into the Marine Safety Information System (MSIS) as soon as possible.

On subsequent visits, inspectors should determine the status of any outstanding requirements either by reviewing the vessel's MSIS Critical Profile (MICP) prior to going on board the vessel, or by noting the Vessel Inspection Record when first boarding the vessel. If there is a question regarding any outstanding requirements, the issuing office should be contacted. When deficiencies are satisfactorily corrected, or not corrected, the witnessing inspector should note completion of the items, with the port, date, and his or her signature on the Vessel Inspection Record. MSIS should then be updated and the issuing office will be notified automatically by MSIS.

3. When to Issue Form CG-835

Form CG-835 should be issued to cover outstanding deficiencies in each of the following cases:

a. When it is apparent that the correction of a deficiency may be subject to controversy between the ship owner or operator and the Coast Guard;

b. When it is desirable to make exact requirements a matter of record;

c. When some deficiencies have not been corrected by the end of the inspection and are permitted to remain outstanding;

d. When it is anticipated that all deficiencies will not be corrected by the end of the inspection or examination;

e. When deficiencies have not been corrected before the vessel proceeds to another inspection zone for completion or continuation of an inspection;

f. When it is anticipated that an inspection will be completed by another inspector;

g. When the owner's representative requests a written requirement to cover items considered by the inspector to be deficiencies; or

h. When the OCMI determines such action to be expedient.

NOTE: In instances when deficiencies are not controversial and corrective action is being taken, the inspector may use discretion in determining whether or not to issue Form CG-835. Written requirements on Form CG-835 should not be issued at the request of the owner's representative or a crewmember to cover repairs or changes initiated by the owner, when such repairs or changes would not have been required by the inspector. However, when such repairs or changes are undertaken, they must be accomplished to the satisfaction of the inspector.

4. How to Write Deficiency Requirements

Introduction

a. Special care should be exercised in the writing of requirements to correct deficiencies. The master should be notified in clear and concise language of the nature of a deficiency and the steps that must be taken to correct it. Unless a particular sequence or system of actions is dictated by statutes, regulations, instructions, or established marine practice, the method of correction should be left to the discretion of the owner or the owner's representative, subject to the inspector's approval.

Basis for Requirements

b. CG-835 requirements are to be based upon specific requirements contained within the regulations. Requirements issued that are based upon the discretion of the OCMI, where allowed by the regulations, are to be clearly worded so that the deficiency to be corrected is clearly understood by the master, chief engineer, or owner. Requirements that cannot be supported by regulations or definitive OCMI policy should not be written.

Completeness

c. Each written requirement should be as nearly complete within itself as practicable. Requirements will normally have completion dates based upon policy established by the OCMI. Vague statements, such as "Bring into compliance with 46 CFR. . .," should be avoided. A statement of the inspector's authority (law or regulation) is not necessary on Form CG-835 unless specifically required by the OCMI. However, when a particular law or regulation contains information that might clarify the terms of the requirements or suggest alternate means of compliance, reference to such sources may be made. It is recognized that requirements may be written under conditions requiring haste or circumstances where reference to authorities is not feasible.

Local Modifications

d. In some inspection zones, standard wording has been adopted for frequently recurring requirements on Form CG-835. This practice has proven to be advantageous to inspectors and vessel owners and operators, particularly in the inspection of small passenger vessels.

5. Notations in Inspection Reports

Refer to MSM II A3 for instruction on making notations in inspection reports.

6. Letters of Outstanding Deficiencies

Introduction

a. Deficiencies may remain outstanding at the completion of an inspection or examination provided that they are not contrary to law, and, in the OCMI's opinion, they will not materially affect the safety of the vessel or the environment during the time they remain uncorrected. These deficiencies will normally fall into the following categories:

(1) Minor requirements, such as those for signs or small repairs, that can be readily accomplished by the ship's crew;

(2) Relatively minor items of equipment that are not then available but have been placed on order;

(3) Repairs that can be safely postponed and accomplished where those interested can most conveniently perform them;

(4) Deficiencies that remain outstanding when a vessel moves from one zone to another to complete an inspection;

(5) Deficiencies that can be more readily corrected when the vessel is in drydock;

(6) Deficiencies on vessels being laid up and placed out of operation; and

(7) Deficiencies that are being appealed.

Notification Procedures

b. Upon completion of the inspection or examination, all deficiencies for which a CG-835 was issued are to be entered into MSIS (see chapter 3 of this volume). MSIS will generate a Marine Inspection Letter of Issuance of Requirements (MILIR). This letter should be printed out on letterhead stationary for the appropriate signature, and mailed to the vessel's owner or operator. This letter includes an itemized listing of the requirements issued and the compliance dates, and serves as the owner's official notification that outstanding requirements were issued against the subject vessel as a result of the inspection. The letter also advises the owner to inform the OCMI when the deficiencies have been corrected.

Extensions of Time

c. Time limits may be extended for good cause by the issuing OCMI, the district commander, or the Commandant. The time limit on a deficiency should not normally be extended by another OCMI or district commander unless the action is agreed to by the OCMI issuing the requirement. In no case should a requirement be modified or cancelled by other than the issuing OCMI.

7. Deficiencies Reported by the Crew

General

a. All licensed officers are required by 46 U.S.C. 3315 to assist the marine inspector and to point out all known defects and imperfections. Inspectors should inquire about deficiencies from the master and chief engineer, and should be receptive to all reports of deficiencies made by the ship's officers and crew. In each case, the reported deficiency should be checked into and corrective action required where indicated. A note concerning each complaint of deficiency should be included in the inspector's report. Inspectors should be aware that 46 U.S.C. 3315 prohibits the disclosure of the sources of information about deficiencies.

Approaches from Safety Committees

b. On many vessels, there are active safety committees under company or union sponsorship that meet regularly to consider a wide range of safety matters. Almost all of these, particularly where material items are involved, are of concern to the Coast Guard. It is highly probable that inspectors will be approached by spokespersons of ships' safety committees, either verbally or by written petition, regarding items of varying severity. Whenever such contact is made, the inspector must note those matters brought to his or her attention and inform the OCMI of the complaints and actions taken. This is necessary because copies of complaints are often forwarded to various officials, including the Commandant and members of Congress. This may lead the Commandant to contact the OCMI for additional information.

8. Condemning Equipment in Use

a. OCMI's should not condemn or impose additional or different requirements on "approved" equipment or other inspection items that have been passed or accepted by another OCMI, except in the following cases:

(1) When deficiencies exist and were undiscovered due to inspection errors or omissions;

(2) When the item has since been damaged or has otherwise deteriorated to such an extent that it is no longer fit for the service intended;

(3) When the requirements of law or regulation have changed and the change is retroactive;

(4) When the route or service of the vessel is being changed, or alterations are being made to the vessel that make changes necessary for compliance with different regulations; or

(5) When directed by the Commandant.

Resolution of Disputed Approvals

b. When equipment or other inspection items previously approved by the Commandant or one OCMI are considered by another to be unsuitable because of workmanship, arrangements, or design, both OCMI's should attempt to resolve the matter between themselves. If the problem cannot be resolved, no further action should be taken until a decision has been rendered by the cognizant district commander(s). When district commanders cannot reach agreement, the matter should be referred to Commandant (G-MOC).

9. Deficiencies Overlooked at Prior Inspections

Items found to be deficient that were overlooked due to errors or omissions, at previous inspections (or by previous inspectors during the same inspection), normally should be required to be corrected. Reference should be made to previous inspection records, and the inspectors concerned should be contacted to determine the status of the item in question. Care should be taken that the item has not been previously approved or accepted as satisfactory before making additional requirements. The vessel owner should be given all possible consideration in the correction of such items found to be deficient because of inspection errors or omissions. Unless immediate correction of such items is considered critical to the safety of the vessel, the OCMI should allow a reasonable amount of time for their correction.

10. Changing of Inspectors During Inspections

Changing inspectors during an inspection should be avoided. When circumstances require a change, there must be a clear understanding between the inspectors concerning approved items and outstanding deficiencies. Proper use of the CG-840 inspection book series and Form CG-835 will facilitate this understanding. The relieving inspector should not change requirements imposed by the first inspector, or impose additional requirements concerning items previously approved or accepted as satisfactory, unless the relieving inspector has received authority from the OCMI or the SIM/CID. Normally, these officers should confer with the first inspector before authorizing a change in requirements or imposing additional requirements.

11. Resolution of Requirements Between Inspection Zones

General Procedures

a. When a vessel changes inspection zones during an inspection, or when some or all outstanding deficiencies issued by one OCMI may be completed in another zone, the requirements issued by the first OCMI should be passed to the next OCMI either by phone or MSIS Mailbox. If a vessel changes its home port or primary port of operation to another zone, the OCMI should ensure that any outstanding inspection cases are filed and that deficiencies are entered into MSIS.

Monitoring Procedures

b. OCMI's should ensure that deficiency requirements issued in another zone are completed. The OCMI who issued the notice of deficiency and the OCMI who last certificated the vessel will be notified automatically by MSIS that the requirements have been satisfied. Additional or modified requirements should not normally be imposed on a vessel approved in one zone when it moves to another zone for a similar operation and route. When there is disagreement between OCMI's as to deficiencies or requirements, the matter should be referred to the district commander(s) for resolution. If the district commander(s) cannot reach agreement, the matter should be referred to Commandant (G-MOC). Unless the situation is extremely hazardous, no modified or additional requirements should be imposed before the matter is resolved. When an OCMI finds it necessary to change or impose immediate additional requirements under the circumstances indicated above, he or she should notify the first OCMI, the district commander(s) and Commandant (G-MOC) by phone or MSIS Mailbox.

Transfer of Records

c. When previous inspection records would be of benefit in resolving questions concerning a vessel inspected in another zone, the OCMI should obtain a copy of such records from the OCMI of the zone in which the previous inspection took place.

D. SPECIAL CONSIDERATIONS

1. Introduction

Throughout the vessel inspection regulations, there are provisions for special actions and considerations to be given in certain circumstances. In many cases, the discretion to give special consideration rests with the Commandant or district commander. In some cases, the OCMI is given this authority and may further delegate the authority to inspectors. Other regulations authorize the inspector to make discretionary rulings on matters within the limits of unit policy. Provisions for special consideration should be used to provide practical application of the regulations, and to avoid unreasonable requirements and arbitrary actions or decisions not necessary to maintain an adequate degree of safety. This policy applies only to those regulations that expressly authorize these special provisions, i.e., 46 CFR 30.15, 70.15, 90.15, 108.105, 175.15, and 188.15.

2. OCMI's Role

The OCMI is authorized by certain sections of the small passenger vessel regulations (46 CFR, Subchapter T) to permit departures from the specific requirements when special circumstances or arrangements warrant such departures. In this regard, the OCMI must recognize that local practices in meeting the peculiarities of local conditions have often proved safe under conditions that do not conform to specific provisions of the regulations.

3. Inspector's Role

Marine inspectors should note in their inspection reports all items that require interpretations of regulations, and on which the OCMI, district commander, or the Commandant has rendered an interpretation. Such items include proposed equivalents, substitutions, non-approved equipment, nonstandard fuel tanks, etc. Certain marine engineering items also require notation. These notes should preclude differing requirements among inspectors by forming the basis for comparison with installed items at subsequent inspections.

E. MAINTENANCE OF VESSEL INSPECTION RECORDS

1. Required Records

The Coast Guard is required by 46 U.S.C. 3310 to keep adequate inspection records. The OCMI should ensure that records of all actions pertaining to vessel inspection (approval or disapproval) are maintained as required. Directives and file systems should be maintained in accordance with the Coast Guard Directives System, Commandant Instruction (COMDTINST) M5215.6 (series) and COMDTINST 5210.5 (series). Inspection records and files should be retained, destroyed, or transferred as required by the Paperwork Management Manual, COMDTINST M5212.12. (See Chapter 3).

2. Transfer of Records Between OCMI's

The inspection records covering the initial construction and inspection of all vessels, except those inspected under 46 CFR, Subchapter T, should be maintained on a permanent basis by the OCMI conducting the initial inspection, subject to the disposal instructions in COMDTINST M5212.12. All current records, except those for the initial inspection, should be transferred to the zone where a vessel transfers its principal port of operation. All current inspection files for a "T-boat," including the files of the initial inspection, should be held by the OCMI of the zone in which the vessel is currently operating. Files should be transferred permanently between OCMI's when the vessel's principal area of operation shifts from one zone to another, and temporarily when they are needed to resolve a current inspection question. When transferring original files, the transferring office should retain adequate file copies in the event of mail loss or damage. Further, the Port of Certification (POC) should be changed in MSIS to the new port to ensure that the cognizant OCMI receives and reviews all reports relative to the vessel. The changing of POC should be directed to MSIS data administrative staff at Coast Guard Headquarters (G-MRI).

3. Certified Copies of Inspection Records

Introduction

a. Certified copies of inspection records will be needed at times for use in court proceedings. These certified copies may be made by a photographic copying process, or by copying the record word for word when the record consists of entries on a form and the same type of form is available. The copy requiring certification should be certified by the OCMI (or acting OCMI) in a manner similar to the following (any questions concerning certification should be referred to the district legal officer):

> "I hereby certify that the attached is a true copy of the original record of inspection covering the inspection of the SS WHIZZ between 8 and 12 May 1985, on file in my office, and of which I am the custodian.
>
> Signed and dated at Philadelphia, PA
> this 15th day of May , 1985
>
> *(Signature)*
>
> by John Doe, Captain, U.S. Coast Guard
> Officer in Charge, Marine Inspection
> Philadelphia, PA"

Certification of Copies

b. If practical, the copy should be stamped with the Coast Guard seal.[1] The certification shall be placed on the front of the record or otherwise attached to it. Certification of each separate page of an inspection report is not necessary. Inspection records requiring certification or validation with the DOT seal shall first be certified by the OCMI and then forwarded to the district legal officer. Instructions with regard to charges for certification of documents are contained in 33 CFR 1.25 and 49 CFR 7.91. Policy concerning the release of investigative records to a court is contained in MSM V. See Figure A2-2 for a sample certificate of true copy.

[1] The Coast Guard seal has no legal effect and is authorized for adornment purposes only, by Department of Transportation (DOT) order. It has been officially replaced by the DOT seal for all legal purposes.

FIGURE 2-2
CERTIFICATE OF TRUE COPY

(To be included in future revision)

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CHAPTER 3: DOCUMENTATION OF VESSEL INSPECTIONS

A. VESSEL INSPECTION REPORTS AND RECORDS

1. Standard Forms

Standard inspection record and report forms, whether manually typed or generated through the Marine Safety information System (MSIS), are developed according to the following criteria:

a. They eliminate or reduce the collection and duplication of unnecessary information;

b. They provide uniform guides that may be modified to accommodate local conditions and needs for administration or for a particular inspection;

c. They are the primary media for transmitting information from the marine inspector to the Officer in Charge, Marine Inspection (OCMI), who is legally responsible for the certification of vessels; and

d. They serve as the permanent record of inspections and certifications.

2. Use of Standard Forms

Due to the variety of vessel types and inspection requirements, each report cannot be construed as limiting or otherwise delineating the complete scope of an inspection. OCMIs are vested with the authority to modify the use of standard forms in order to provide the flexibility to "fit" the forms to local needs. In such modifications, the primary objective of reducing the paperwork load on both the inspectors and the clerical staff should be maintained. Practices that eliminate or reduce paperwork that are not prohibited by instructions governing the use of forms may be used.

B. VESSEL INSPECTION DOCUMENTS

This chapter also provides guidance to standardize entries on inspection documents that are issued to and maintained on board commercial vessels. To avoid potential problems attributable to time lags in recording inspection status data, an MSIS case shall be opened at the start of every vessel inspection, rather than when the inspection is completed. This will assist vessel file users in determining if a required inspection is past due or has been undertaken in another OCMI zone. At the initial inspection for certification, the inspector should review all pertinent MSIS products to ensure that all appropriate and applicable information that should appear on the Certificate of Inspection (COI) and other documents is obtained for entry into MSIS. At each subsequent reinspection, drydock/hull exam or inspection for certification, the inspector should review the COI and other vessel documents to verify the accuracy of the information. In addition, prior to conducting an inspection for certification, the inspector should review the applicable Marine Inspection Preinspection Package (MIPIP). Inspectors should make every attempt to complete blank fields on the MIPIP to ensure that complete MSIS records are maintained on a vessel. At the OCMI's discretion, the inspector may provide the vessel with a copy of the MIPIP to assist the vessel operator in maintaining the vessel. The inspector should ensure that any changes that have occurred, such as change in owner or operator, propulsion, operating area, etc., are properly documented prior to the issuance of either an amended or new COI, or other documents.

C. VESSEL INSPECTION DOCUMENTATION

1. General Discussion

The Importance of accurate and complete reports is stressed. They serve as public records of vessel inspections, and reflect upon the professionalism and efficiency of the inspector, the marine inspection program, and the Coast Guard as a whole. The provisions of this section should be followed in the preparation of the optional inspection booklets ("840 books"). The inspection books have been significantly revised from the original bulk-printed format. The old-840 books are no longer in print, however, the new versions, maintained by RTC Yorktown, are available for downloading from the internet at www.uscg.mil/rtc. Use of the new inspection booklets, while optional, is encouraged. Included in the revision are specific cites where applicable regulations can be found. This is a tremendous aid to both the marine inspector, and the vessel owner. The marine inspector can quickly access a specific regulation and use the opportunity during the inspection to more fully inform the vessel owner.

> **NOTE:** While use of the inspection booklets is optional, a Marine Inspection Activity Report (MIAR) is required for all inspections. The MIAR should be verified by the attending inspector prior to being validated.

2. Use of Booklets

The booklets should be used as a job aid only, for the marine inspector. It may be used as a draft record of the items checked during the inspection when conducting each major vessel inspection as appropriate, for later transfer to MSIS or MSN. These booklets may also be used during any special vessel inspection that is extensive enough to warrant their use. Each booklet is set up in outline form to serve as memory joggers with the appropriate reference cite listed.

> **NOTE:** The booklets were developed to be as complete as possible to cover all items that should be examined during a particular inspection; however, they may not encompass all facets of a particular vessel, and the inspector is cautioned against relying totally upon the items listed in a booklet in order to conduct a thorough inspection (see other chapters in this manual for further guidance in carrying out the various types of inspections).

The inspector should use the appropriate booklet(s) for each inspection. A MIPIP should be included with the booklet for each initial inspection for certification to ensure that all applicable vessel data has been entered into MSIS.

3. Merchant Marine Inspection Requirement Form CG-835

This form is used to record all conditions aboard a vessel, its equipment, or its materials that do not conform to the requirements of statutes, regulations, or "good marine practice." See MSM II-A2 for additional guidance on the issuance of this form. Copies of all "835s" that are issued should be attached to the appropriate inspection booklet form.

Outstanding Deficiencies Issued on Form CG-835

a. Outstanding Deficiencies Issued on Form CG-835 will also be entered as before in the MIAR. A numbered block in an inspection booklet should not be initialed if an item is unsatisfactory. In such cases, the deficiency should be described on the blank page opposite the item, with the date of the entry. If the deficiency is corrected prior to completion of inspection, the numbered block may then be initialed. If the item is not completed satisfactorily before completion of the inspection, and a requirement is issued on Form CG-835, this should likewise be noted on the page opposite the item.

Partially Completed Items

b. Partially Completed Items should be noted, as in these examples from Form CG-840A:

(1) "A-2. (Date) All satisfactory except one closure dog missing for hatch cover to after void; see attached CG-835";

(2) "A-2. (Date) Unsatisfactory. See remarks on attached CG-835."

Remarks

c. Remarks. Entries are to be made in the “Remarks” (including diary) section for each inspection visit to a vessel. Inspectors are encouraged to use a personal note book or working copy of the CG-840 booklet for recording daily remarks on inspections that span several days, weeks or even months. This will greatly assist the inspector in drafting the final narrative summary at the conclusion of the inspection. Personal notebooks are the property of the individual inspector and need not be retained, submitted for review, or included in the official record. Duplication in the diary of the check off blocks in the CG-840 booklet is unnecessary. For example, if an item is found satisfactory and the block is initialed by the inspector, mere repetition of that information in the diary is redundant. However if repairs or replacements were required to make the item satisfactory, then a brief note in the diary may be appropriate. Further, information which will assist subsequent inspectors in the conduct of their inspection should be included in the diary. For example, identification of which specific components were examined among a random sampling of a large group would aid subsequent inspectors in their selection of which components to target at the next inspection

Below are some examples of entries:	
1	"Visited vessel in company with (owner's representative) on (Date) at (Place) to conduct drydock examination for credit. This is a standard single-skin tank barge, with 8 integral cargo tanks, a void space in the forward rake, and a box void aft as shown by sketch. There is one cylindrical 7500 gallon diesel fuel tank on deck. The barge is approved for the carriage of Grade B and lower products."
2	"Examined all pressure/vacuum valves and flame screens after they were opened for inspection; all were found satisfactory with the exception of those noted on page (blank page number opposite the inspection item)."
3	"Examination of the vessel's eight combination f ire nozzles revealed they were in good condition and suitable for this type of vessel, which requires only the solid stream nozzle. However, as these nozzles (described on page 9) are not Coast Guard approved, the matter was referred to the OCMI. After I witnessed a test that indicated superior performance of these nozzles compared to the approved straight-bore, the OCMI permitted acceptance under special consideration provisions of 46 CFR 175.25-1."
4	"All items listed on pages 4 through 7 were inspected and found satisfactory except as noted."
5	"Visited vessel to inspect progress of construction of the hull and internal structural members. All work was proceeding satisfactorily in accordance with approved plans. Several areas in the port fuel tank were marked for pickup welding."
6	"Witnessed a satisfactory 4 foot hydro on No. 2 P cargo tank, including examination of hull and deck area in way of tank. A final inspection of the vessel's entire underwater body was made prior to launching and found satisfactory. Initial drydock examination completed."
7	"Initial inspection for certification completed with four (4) outstanding deficiencies noted by attached CG-835s. Issued temporary Certificate of Inspection this date and recorded information in Bridge Record Card."

Additional Items to be Recorded

d. Additional Items to be Recorded.

Spaces Not Entered

(1) Spaces Not Entered. An entry should be made in the hull book and diary regarding spaces that were inaccessible during an inspection for certification or reinspection. The drydock book should also have a similar entry. A pre-inspection check of previous inspection books and/or MSIS data should indicate which spaces, if any, have not been entered in the recent history of the vessel. Arrangements should be made to facilitate inspection of those spaces that are due for examination to ensure the structural integrity of the vessel. A review of inspection books and MSIS data should be capable of producing a "running inventory" of spaces entered/not entered throughout a vessel's history.

Extensive Repairs/Alterations

(2) Extensive Repairs/Alterations. These should be briefly described on the page opposite the applicable numbered block and referred to in the "Remarks" section. A copy of shipyard specifications may be attached to the inspection report in lieu of writing a detailed description of the repair or alteration in the diary (e.g., "A-i. Extensive bottom and side shell plating required replacement due to general wastage. See Remarks and attached specifications.").

Record of Inspection Page

e. Record of Inspection Page. This page should include the name of the vessel representative who accompanied the inspector during the inspection and the telephone number where that individual can be reached. The inspector must indicate whether the vessel "is" or "is not" fit for the route intended. If the vessel is not considered fit for service, then the CID should be notified as soon as possible. The inspector should print his/her name on this page and then sign where indicated.

Documenting Inspection Hours

f. Documenting Inspection Hours. It is vital that the total number of hours spent in conducting each vessel inspection be accounted for and accurately entered into MSIS. Inspection hours are not limited to just the actual time spent on a vessel. Work and other inspection or administrative-related functions that are connected to a vessel inspection include activities performed in the office and at locations other than a shipyard or facility where the vessel is located. The specific guidance for categorization of inspection man hours (e.g., travel, administration, inspection-related functions are: plan review; all hull inspection) is contained in the MSIS transaction guide series volume 4, Marine Inspection. Examples of associated travel time, including layovers at airports; meetings with vessel representatives; factory inspections of equipment for a specific vessel; etc. Examples of administrative-related functions for an inspection are: preparing and filing inspection reports, including writing diary entries; filing travel claims; etc.

Record of Unsatisfactory Conditions or Deficiencies Identified

g. Record of Unsatisfactory Conditions or Deficiencies Identified. As marine inspection program managers, representatives of the various Headquarters Divisions are often called upon by legislators and others in and out of government to produce records which show the "value added" by the marine inspection program. Some of those familiar with the program have mistakenly interpreted the fact that since very few "deficiencies" are noted in MSIS, then we are not finding anything wrong on the vessels we inspect. We have hastened to explain that the MSIS records show only those deficiencies which remain outstanding after the conclusion of an inspection, a number which ideally should be "zero." Nonetheless, we must document and present a more complete picture of the marine inspector's role in detecting vessel safety deficiencies. There are several benefits to this process. First is the ability to measure and monitor areas that are problematic and should become the focus of policy, procedures, or regulation. Second is the need to focus training for inspectors on vessels and/or systems with high deficiency rates. Finally, this information enables us to evaluate the effectiveness of the owners/operators, classification societies and other flag administrations in carrying out their maritime safety responsibilities.

(1) The process of recording deficiencies detected during the course of an inspection has always been conducted informally by marine inspectors through personal records, notes, or in some cases, a formal work list which is provided to the owner's representative. By standardizing this existing process, we can make productive use of this valuable, and previously lost, information.

(2) Accordingly, in addition to the information noted in the inspection diary inspectors shall complete a comprehensive listing of deficiencies identified during the course of an inspection. This listing will include all deficiencies noted by the inspector, including those corrected on the spot, those corrected prior to completion of the inspection, and those outstanding at the completion of the inspection. The sample form in this manual (Figure 3-1, Coast Guard Record of Deficiencies Identified) is a suggested method by which inspectors may record deficiencies noted throughout the course of an inspection. If preferred, inspectors may utilize the diary section of the CG-840 booklet, or a local form to list their deficiencies in place of the sample form provided. If used, the sample deficiency form shall be attached to the CG-840 booklet at the conclusion of the inspection and retained locally. This record keeping requirement applies to both U.S. flag vessel inspections and foreign flag vessel examinations performed by marine inspectors (i.e., TVEs, CVEs, LOCs). This requirement does not apply to port safety activities at this time.

(3) At the conclusion of the inspection the inspector shall classify the items on the deficiency list by MSIS code, using the MSIS data entry matrix form provided in this manual (Figure A3-2, Vessel Inspection / Examination Deficiency Summary). Instructions for completing the form are indicated on the form itself. The individual deficiencies can then be totaled by code. MSIS is currently being updated to accommodate the entry of this information. In the interim, until the MSIS change is completed the information shall be recorded on the matrix form and a completed copy of same shall be forwarded to Commandant (G-MOC-2) each month via rapid draft letter or fax to (202) 267-4394. When the change is on line, direct input into MSIS will eliminate the need to forward paper copies. Only the totals by category need to be entered into MSIS.

Figure A3-1

Coast Guard Record of Deficiencies Identified					
Name:		**VIN:**		**Date:**	
Deficiency				**Code**	**CG-835 Issued?**

NOTE: Deficiencies identified should be listed and coded with system and priority, i.e., BM2, FF1, etc. At completion of inspection or examination, any outstanding deficiencies shall be entered in MIDR or PSDR, as appropriate. All deficiencies found (outstanding and completed) shall be entered in the Deficiency Summary. Worklist items that serve only as memory joggers to complete inspection/examination, i.e., "test emergency fire pump," should not be coded as deficiencies.

Figure A3-2

Vessel Inspection / Examination Deficiency Summary					
Name:		**VIN:**		**MSIS Case#:**	
Vessel Type:		**Flag:**		**Class Society:**	
Inspection Type:				**Date Completed:**	

Deficiency Summary			
		Priority	
System	**Code**	**1**	**2**
Ballast	BS		
Bilge	BI		
Boiler, Aux	BA		
Boiler, Main	BM		
Cargo	CS		
Deck Machinery	DM		
Docs, Lics, Pmts	DL		
Dry Cargo	DC		
Electrical	ES		
Fire Fighting	FF		
Fuel	FL		
General Safety	GS		
Habitation	HA		
Hull	HU		
Internal Combustion Engine	IC		
Lifesaving	LS		
Miscellaneous	MI		
Navigation	NS		
Propulsion	PP		
Steering	SS		

All deficiencies identified, whether corrected or uncorrected prior to the completion of the inspection, should be included in the totals on this sheet. Each deficiency listed on Figure A3-1 will be assigned the appropriate code and priority (See priority assignment guidance below.) Enter the prioritized totals from Figure A3-1 in the appropriate block at left.

Priority 1: Those items which must be corrected prior to allowing the vessel to sail.

Priority 2: Those items which must be corrected, but the required correction may be deferred (i.e., does not prohibit the vessel from sailing).

Waste Reception	WR			

4. Completion and Legal Status of the MIAR

The MIAR, just like the inspection booklet, forms a part of the inspector's primary work product. The MIAR should contain all of the required information pertaining to the inspection. Together with the inspection booklet, they form the official record of the inspection, as well as the legal record. Information entered in the inspection diary should not duplicate information contained elsewhere in the MIAR.

D. PERFORMANCE OF AUTOMATED MACHINERY AND EQUIPMENT

Regulations for automation are contained in 46 CFR 62. Upon completion of underway tests of initial installations, a letter reporting the performance of the vessel's automated machinery and equipment shall be submitted to Commandant (G-MOC) in accordance with COMDTINST 16711.1 (series). See chapter 6 of this volume and NVICs 1-69, 7-73, and 6-84 for additional information concerning automated main and auxiliary machinery.

E. U.S. PUBLIC HEALTH SERVICE (PHS) INSPECTION RECORDS

The PHS promulgates official certificates for sanitary inspections of commercial vessels. These certificates may be kept in the pilothouse document frames installed on ocean and coastwise vessels for the Vessel Inspection Record Card, Form CG-2832, provided they do not obstruct the card.

F. LOCALLY MAINTAINED RECORDS

1. Measurement of Furnaces, Form CG-836 Form CG-836 should be completed when deemed necessary by the OCMI when an inspection is performed on a firetube boiler. The completed report should be retained in the vessel's file.

2. Renewals of Fusible Plugs When fusible plugs are renewed at other than the inspection for certification and no marine inspector is in attendance, the Chief Engineer shall submit a written report to the OCMI. The OCMI shall ensure that the report is complete and consistent with the information requirements of 46 CFR 2.20-40(c) and 52.01-50(k). These reports should be included in the vessel's inspection records.

G. MARINE SAFETY INFORMATION SYSTEM (MSIS)

1. Purpose

The purpose of MSIS is two-fold: to build safety performance histories of vessels, marine facilities, involved parties, and hazardous cargoes; and, using these histories in analysis of safety degradation patterns and equipment failures, to focus and redirect marine safety activities and resources.

2. MSIS Design Overview

MSIS is designed as an integrated system for providing information to support the operation, management, and decision making functions of the Marine Safety activities. MSIS merges information from field activities into a common information base which can be shared by all users, and which builds performance histories.

3. Files

The MSIS data base is composed of master and activity files. All files are interrelated and support one another. The master files are continually updated with real-time marine safety operational data obtained as submitted by field units. Activity files are product sets or groupings of activity related products. Products are automated reports, forms, schedulers, and logs.

a. Vessel File (VF). The Vessel File is the master file which presents the core of all vessel-related MSIS activity. This file maintains a current history for each vessel in MSIS including its Coast Guard involvement, safety performance history, associated involved parties, and information on vessel particulars and systems. Information on each vessel in the Vessel File is automatically updated through MSIS activity reporting. The data captured is automatically mapped to other products, providing vessel information, decision support, and information necessary for MSIS to generate vessel logs, reports, and forms. The MSIS Transaction Guide for Vessel File (VF) should be consulted for particular entry, update, and retrieval details.

b. Marine Inspection (MI). The Marine Inspection file is the activity file product set and is the principal tool for field units to manage and report commercial vessel inspections within the Marine Inspection (MI) program. It is designed to capture and report all data relevant to periodic and special inspections of vessels and facilities as specified by the Marine Safety Program. The MSIS Transaction Guide for Marine Inspection (MI) should be consulted for particular entry, update, and retrieval details.

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4. Discontinuation of Certain MSIS Information

Commandant (G-MOC) has determined that the information required in certain MSIS data fields need no longer be captured and recorded in MSIS. The data fields for these discontinued entries will be removed from MSIS at the earliest possible opportunity. Effective with this manual change:

a. "Q" numbers and serial numbers for vessel equipment, excepting pressure vessels and boilers, need not be entered.

b. Winch and windlass data need not be entered.

c. The number of on hand fire extinguishers and spares need not be entered. (However, careful attention should be paid to ensure that the required number of extinguishers is correctly entered.)

d. MIDRs need no longer specify location, type, cause, or "Q" number.

e. Additional product set entries as indicated in Figure 3-3 (MSIS Entries No Longer Required) need not be recorded.

FIGURE 3-3: MSIS ENTRIES NO LONGER REQUIRED
(Listed By Product Set)

VFCD: PRIS HULL NUMBER

VFDD: SPECIAL DESIGN FEATURES (ALL)

VFMD:

- DESIGN WATER LINE
- DESIGN DRAFT
- TPI-DESIGN DRAFT
- MIDSHIP SECTION MOD
- MTI-DESIGN DRAFT
- STILL WATER BEND MOM

(All other entries in this set shall be in U.S. measurements

VFOD: MINIMUM CREW

VFSL: OMIT ALL EXCEPT STABILITY DOC ENTRY

VFBD:

- MAIN PROPULSION BOILERS PRESSURE SPHT SET & TEMP

(DES entry is retained)

- SET & TEMP FOR AUXILIARY BOILERS
- Q-NUMBERS AND MODEL NUMBERS FOR SAFETY VALVES SPECIFICATIONS
- MAIN STEAM PIPING INITIAL WALL THICKNESS

(All entries in this set shall be in U.S. measurements in thousands, no decimals allowed)

VFCS:

- OIL OUTFLOW CRITERIA
- TRANSFER CONTROL CLASS
- TANK SPACE LENGTH
- CTR TANK BRDTH
- WING TANK BREDTH
- CL BLKHD
- CARGO TANK SPECIFICATIONS (ALL)

FIGURE 3-3: MSIS ENTRIES NO LONGER REQUIRED – Continued

VFDM: WINDLASS/WINCH DATA (ALL)

VFED: MODEL

VFFF:

- PLAN NUMBER
- HOSE DETAIL (LINED OR UNLINED ONLY)
- CARGO TANK HEATER TYPE

VFPF: ON HAND (ALL)

VFHD:

- RUDDER TYPE
- FLANK RUDDER (Y/N)

VFLS:

- DAVIT AND WINCH SERIAL NUMBERS
- L/B-L/F-BA: Q NUMBERS AND SERIAL/LOT
- PORTABLE LIFEBOAT RADIO LOCATION
- LINE THROWING APPLIANCE DATA

VFMS: (ALL)

VFND:

- DESCRIPTION OF COMMS FOR BRIDGE TO-(ALL)
- EQUIPMENT ID MODEL AND SERIAL NUMBERS

FIGURE 3-3: MSIS ENTRIES NO LONGER REQUIRED – Continued

VFPP:

- AUTOMATION-MODEL OF BASIC SYSTEM
- PROPELLERS-CONSTRUCTION
- CLUTCH SYSTEM-(ALL)
- REDUCTION GEAR-(ALL)
- MAIN PROPULSION TURBINE MACHINERY-MODEL
- MAIN PROPULSION ELECTRIC MACHINERY-MODEL
- RECIPROCATING MACHINERY-MODEL
- AUX PROPULSION-MODEL

VFSD:

- HP
- MODEL
- NUM OF CYLINDERS
- NUM OF RAMS
- TURN RATE IND?
- RUDDER ANGLE MANUFACTURER AND MODEL

MIDR: Entry of location, type, cause and Q-number is no longer required

H. CERTIFICATE OF INSPECTION (COI), STANDARD MSIS FORM

1. COI Entries—First Page

Information entered in the MSIS Vessel File Operating Details (VFOD) comprises a majority of page one of a COI. VFOD is where the OCMI specifies manning, route, number of passengers permitted, as well as details regarding the carriage of passengers and cargo. VFOD is divided into three sections used to collect information which will appear on the COI. The first section is used to specify the route of the vessel (using the Route Code), number of passengers permitted and minimum crew required. For passenger vessels authorized multiple routes with varying crew and passenger restrictions, the summary section should contain the crew and passenger requirements for the most restrictive of the routes authorized (e.g., if authorized 149 passengers on a "Coastwise" route and 99 passengers on an "Oceans" route, specify the Oceans route requirements). The second section of VFOD specifies the manning requirements for the vessel. As above, if the vessel is authorized multiple routes, the manning requirement for the most restrictive route shall be entered. The third section of VFOD is used to specify the details regarding the vessel's route, manning, cargo and passenger carriage and any other conditions of operation. Within this section, the OCMI may specify manning and passenger carriage restrictions for vessels authorized multiple routes. Consult the applicable MSIS Transaction Guides for specific details concerning other MSIS products to be used for making entries.

2. Amplifying Guidance on Particular Portions of the

Passengers—General

a. Except for ferryboats, the OCMI is responsible for determining the number of passengers that a vessel can accommodate and can carry with prudence and safety. The OCMI should not permit the number of passengers allowed to exceed that permitted by law or regulation. The number should be based upon specific criteria including, but not limited to, the vessel's intended operating area, lifesaving equipment carried, stability, deck area and or rail space. See chapter 10 of this volume concerning the number of passengers permitted to be carried aboard an excursion vessel.

Maximum Number on Ferry Vessels

46 U.S.C. 3501 provides an exception for stating on the COI of a ferry vessel the number of passengers permitted to be carried on the vessel. The maximum number of passengers permitted on a ferry will appear on the COI as "FERRY" when "FERRY" is entered as the Vessel Use Code in the Vessel File Design product (VFDD).

NOTE: When stability is a factor in limiting the maximum number of persons that can be carried with safety on any ferry vessel, the total number of persons permitted aboard should be stated in the stability letter.

Persons on Board Other Than the Minimum Operating Crew

b. This policy is intended to give uniform guidance on how the manning data should be entered in MSIS for persons other than the minimum required crew.

"Other Required Crew"

(1) "Other required crew" consists of maintenance persons which have been required by the OCMI due to the special design or operation of a vessel. The number required should be listed with a specific description in the space provided.

"Other Persons In Crew"

(2) "Other persons in crew" are licensed and documented crew employed on board to operate and maintain the vessel in addition to the minimum crew set by regulatory requirements. This designation includes persons in the stewards' department, additional licensed or documented crew which the owner wishes to carry to perform maintenance while underway, and hotel staff.

"Persons In Addition To Crew"

(3) These are individuals in addition to the crew on an inspected vessel which is not required to be inspected as a passenger vessel. This term includes persons on board a vessel who are not employed in the business of the vessel. These persons are not required to hold a merchant mariner's document. Reference is made to 46 U.S.C. 3304 concerning the number of individuals in addition to the crew permitted on vessels other than passenger carrying vessels.

Industrial Personnel and Scientific Personnel

(4) Industrial personnel are defined in 46 CFR 90.10-15 and scientific personnel are defined in 46 CFR 188.10-71. These personnel are distinct from "passengers," "other required crew," "other persons in crew," and "persons in addition to crew." However, the number of such personnel employed aboard a vessel affects its structural fire protection requirements. If an industrial vessel of 300 Gross Tons or more is carrying over 12 industrial personnel, or an oceanographic research vessel is carrying over 16 scientific personnel, the respective vessels must be inspected for compliance with applicable structural fire protection regulations. Therefore, the number of authorized industrial and scientific personnel shall be identified, and their duties specifically described, on the COI through the MSIS VFOD "free form" blocks. Artificially inflating the "other persons in crew" and/or "persons in addition to crew" categories to avoid compliance with structural fire protection regulations or passenger vessel regulations is not permitted.

Reduced Crews

c. When reduced crews are authorized for less than 24-hour operation, the OCMI shall enter an endorsement under "Route Permitted and Conditions of Operation." Multiple endorsements may be made on a vessel's COI when necessary to address changes in conditions or employment. For additional information, consult volume III of this manual.

Small Passenger Vessels

d. Detailed policy guidance on manning is provided in MSM Volume III, Chapter 19. See MSM II A3.H.3.a regarding allowable reductions in the carriage of child size life preservers when extended size devices are carried on board.

Automation

e. When a reduced manning level has been approved by OCMI on the basis of an installation of automated control or monitoring systems, appropriate COI endorsements will be required IAW 46 CFR 62.50 and MSM III Chapters 21 and 23.

Route Permitted and Conditions of Operation

f. This is the narrative portion in which the major route designation is stated, i.e., oceans coastwise; Great Lakes; lakes, bays and sounds; or rivers.

NOTE: The route code entered does not map into the narrative portion.

Limitations imposed or extensions granted on routes based upon stability criteria, unique construction or operating characteristics of the vessel, operating areas, etc., should be described by bodies of water, geographic points, distances from shore or geographic points, duration of voyage, daylight operation only, etc. Further conditions of operation, where applicable, would include manning endorsements and any other special endorsements deemed necessary by the OCMI.

Barges

g. Barges

(1) Financial Responsibility. Prior to the Oil Pollution Act of 1990, the financial responsibility requirements of the Federal Water Pollution Control Act (FWPCA), as amended, provided for a reduction in the liability limits on "Inland Oil Barges," for the removal of oil discharged into U.S. waters. For this purpose, inland oil barges were defined as non-self-propelled vessels carrying oil in bulk as cargo and certificated to operate only in the inland waters of the United States. The Oil Pollution Act of 1990 removes these limits of liability. Therefore, for financial responsibility/liability purposes, no distinction between inland oil barges and other oil barges need be made on Certificates of Inspection.

NOTE: This reminder replaces previous text (superseded by the passage of the Oil Pollution Act of 1990) regarding reduced financial responsibility for inland oil barges. Routes should continue to be limited for other reasons such as design and class limitations.

Permissive Crewing

(2) Where an owner/operator voluntarily elects to crew a barge not otherwise required to be crewed, the vessel's Route Permitted and Conditions of Operation section of the COI shall be endorsed: "The vessel may carry (##) persons as maintenance persons with no duties connected with the navigation of the vessel." On seagoing barges over 100 GT, the endorsement should include the statement: "All maintenance persons must possess a merchant mariners document, and a minimum of 75 percent of those persons aboard must be U.S. citizens." This endorsement may be further modified to limit the route on which personnel may be aboard based upon load line, lifesaving equipment, or other relevant factors.

Watchstanders

(3) An endorsement for a watchstander on tank barges need not be made as he/she is to be included in the crew requirements.

Carriage of Vehicles

(4) Endorsements for the carriage of vehicles on tank barges may be stated as "Permitted to carry vehicles - total weight 8,000 kg per unit; axle load 2,500 kg per axle. Vehicles may not be operated."

3. COI Entries - Attachments

Attachments to the Certificate of Inspection are issued when there is more information required for a particular vessel than will fit onto the first page. This includes additional endorsements (see paragraph 3.H.4 below) and information on vessel particulars such as cargo authority and/or loading restrictions for tank vessels/barges, lifesaving and fire fighting equipment, machinery inspection status, stability letter, and pressure vessels. The following provides information on some of the more frequently used and/or critical detail products. This is by no means an all encompassing list; all MSIS Vessel File and Marine Inspection Products should be reviewed and MSIS Transaction Guides utilized to ensure that each vessel has applicable information entered.

Lifesaving Details

a. Lifesaving Details.

(1) The number of persons for which lifesaving equipment is to be provided should normally be the same as the total persons carried; however, for ferry vessels, this figure should be the same as the number of life preservers required. Only the minimum number of items required by regulations are to be listed; excess equipment shall not be listed.

(2) NVIC 14-92 deals with use and carriage of lifejackets (life preservers) with height/weight limits which are lower than the traditional 41 kg (90 lb) for adults. Lifejackets with other, lower height/weight limits marked on them may be used to meet mandatory carriage requirements for persons as the label indicates. Adjustments to carriage requirements for life preservers may be made on the Certificate of Inspection (COI) according to NVIC 14-92. When lifejackets on board have a lower limit of 1.45 m (57 in) or less, only 5% additional child-size devices must be carried on vessels with no limitation on adult or child passengers on its COI. Carriage of a mixture of lifejacket models/styles with lower size limits should not be accepted as the basis for reducing child-size lifejacket carriage requirements.

Children and COI Endorsements

(3) Children and COI Endorsements. If no child-size lifejackets are carried on board, the vessel's COI must be endorsed:

(a) "For the carriage of ADULTS ONLY"; or

(b) "For the carriage of persons taller than XX m or weighing over WW kg. Replacement lifejackets must have an approval for all persons over XX m/WW kg or a smaller lower limit."

NOTE: When the paragraph (b) endorsement is used, the height/weight limits (XXX m/WW kg) are 1.45 m/34kg (57 in/75 lb) for the life preservers listed in enclosure (2) of NVIC 14-92. For life preservers with lower limits below 1.45 m (57 in), the height/weight limits must be taken from their label. A zero ("0") will be entered for the number of child's lifejackets in the Lifesaving Details section of the COI.

(4) The total number of persons that can be accommodated shall be according to the nameplates on the items. The capacity of the rescue boat need not be included. A lifeboat suitable for rescue purposes shall be listed as a lifeboat.

(5) This data should reflect the number of items that are actually carried to meet the minimum total capacity (number of persons) required by regulation. The total capacity of the required items shall be listed.

b. Cargo Authority.

(1) Carriage Of Oil. For each U.S. tankship and integrated tug/tank barge unit of 20,000 or more deadweight tons permitted to carry "oil" (46 U.S.C. 2101(20)), the cargo authority is listed on its COI to specify the type of cargo authorized, the applicable subchapter, the loading constraints - structural, and the loading constraints - stability. The proper authorization endorsement is determined from the applicable regulations in 33 CFR 157 and 46 CFR 32.53. Cargo grade restrictions are entered under "Highest Grade." The value for "Capacity" shall be that of all integral cargo tanks, and the "Units" shall be in barrels. If Subchapter O cargo is carried, then the appropriate Part shall be indicated. Data regarding "Loading Constraints" will be provided by Commandant (G-MSC) and is to be entered as appropriate. Special cargo restrictions and/or exemptions, such as those found in 46 CFR 36.01-5 and 46 CFR 38.01-5 shall be listed by endorsement under "Route Permitted and Conditions of Operation." The following are samples of appropriate wording for "Authorization" entries:

(a) "Crude oil and flammable or combustible liquids";

(b) "Products and flammable or combustible liquids other than crude oil";

(c) "Products and combustible liquids";

(d) "Crude oil, products, and flammable or combustible liquids"; or

(e) "Flammable liquids other than oil."

(2) MARPOL ANNEX II/Noxious Liquid Substances (NLS). MSC has been reviewing the cargo tank arrangements on tank vessels subject to the regulations which implemented MARPOL ANNEX II in Subchapter O of both Titles 33 and 46. The end product of MSC review is a comprehensive List of Authorized Cargoes (LAC), including those to which 46 CFR 153.900(a)(2), and 33 CFR Parts 151.33(a) and 151.35(a) & (b) apply, which provides characteristics and requirements for each tank grouping based upon plan review. Due to the LACs length and complexity, it presently cannot be entered directly into existing MSIS products. For this reason, until a more permanent means of providing COI endorsements for MARPOL ANNEX II cargoes is instituted in MSIS, the MSC stamped LAC must become the subject of an endorsement to the COI in accordance with the following procedures:

(a) Tank Arrangements. A vessel's cargo tank arrangements should be examined at the inspection for certification to verify the information used by MSC in determining cargo carrying authority for each cargo tank or group of cargo tanks. Any discrepancies between the inspector's findings and the LAC should be reported to MSC so that the LAC can be updated.

(b) Vessel File Cargo/Ballast Details (VFCS). Information in the VFCS product for each tank group should be verified or entered as necessary. The description paragraph for each reference group of tanks may be used to identify tanks which do not fit in the "Tank Location(s)" slot.

(c) Vessel File Cargo Authority (VFCA). Enter the following text in the "Authorization" line:

➔ See “Cargo Authority” Located In “Conditions of Carriage.”

(d) Vessel File Cargo List (VFCL). Delete the existing cargo list, if necessary, and enter the Chem Code "123." This entry is linked to standard text that reads:

➔ See “Cargo Authority” Located In “Conditions of Carriage.”

(e) Vessel File Conditions of Carriage (VFCC). The following statement should appear at the beginning of the COI "Conditions Of Carriage" section:

"Per 46 CFR 150.130, The Person In Charge Of The Barge (Vessel) Is Responsible For Ensuring That The Compatibility Requirements Of 46 CFR 150 Are Met."

(f) Once all the tank groups' characteristics and requirements have been verified by an inspector as matching those shown on a tank vessel's LAC, the following text from the MSC's plan approval letter should be entered in VFCC under another "Cargo Authority" heading:

"Only Those Cargoes Named In The Vessel's List Of Authorized Cargoes Bearing Marine Safety Center Approved Stamp Dated (date) May Be Carried, And Then Only In The Tanks Indicated."

(3) Inland Tank Barges. The following statement should appear at the beginning of the COI of an inland tank barge under "Conditions of Carriage (VFCC)":

"Per 46 CFR 150.130, The Person In Charge Of The Barge (Vessel) Is Responsible For Ensuring That The Compatibility Requirements of 46 CFR 150 Are Met. Cargoes Must Be Checked For Compatibility Using The Figures, Tables, And Appendices Of 46 CFR 150 In Conjunction With The Reactive Group Numbers From The 'React Grp' Column Listed Above The 'Specific Dangerous (i.e., Hazardous) Cargo Authority' Section."

NOTE: These endorsements replace the old ones that began with "Cargoes which when mixed with each other....", which was superceded when the cargo compatibility regulations of 46 CFR 150 were implemented in 1980.

(4) Vessels Not In Compliance With MARPOL Annex II. A self-propelled vessel or oceangoing non-self-propelled vessel, certificated under Subchapter D and which is not in compliance with the Annex II regulations, should have a COI endorsement that excludes the carriage of NLS cargoes, e.g., "Vessel may not carry cargoes that are designated as NLS in Table 30.25-1 of 46 CFR 30.25, 33 CFR 151.47 and 33 CFR 151.49." The standard cargo authority entered under Vessel File Cargo Authority (VFCA) for the COI of these vessels is only by grade(s) of flammable or combustible liquids and does not distinguish NLS cargoes. See section D.10.c, chapter 10, of this volume for additional guidance.

c. Additional Marine Inspection Details. Hull examination dates/intervals should be entered in as an attachment to the COI. Other vessel particulars and systems such as fixed fire fighting systems, steering gear, and machinery can be entered into MSIS by referring to the MSIS Transaction Guide (VF).

4. COI Entries - Additional Endorsements

Military Sealift Command Vessels

a. The following entries should be made for Military Sealift Command vessels that are certificated:

(1) For vessel service, enter PUBLIC VESSEL only if the following conditions are met:

(a) Vessel is Navy owned and operated by a Military Sealift Command civilian crew; or

(b) Vessel is demise chartered by the Military Sealift Command and is operated by its own civilian crew.

Vessels which are time chartered by the Military Sealift Command, or are either Navy owned or demise chartered and operated by a contract operator, are not considered public vessels. The class of vessel is as appropriate.

(2) Under "Route Permitted and Conditions of Operation," insert the following endorsement:

"Naval Vessel, In Service, Civilian Manned. This Vessel Has Been Inspected And Certificated In Accordance With The Standards Applicable To Military Sealift Command Vessels."

NOTE: The term "in service" refers to Military Sealift Command vessels that are manned by civilian crews, as opposed to those manned by naval crews and termed "in commission."

(3) "Persons in Addition To The Crew" should reflect the number of persons carried on board a vessel who are connected with the business of the vessel but not properly classed as crew or passengers. Such persons include military liaison staff on transports or fleet support vessels, technicians and scientists on oceanographic research vessels, military guards on certain cargo vessels, etc. Such personnel should be reflected in the total persons allowed.

b. Seasonal Restrictions. COI statements of seasonal restrictions should be as descriptive as possible, showing limitations on vessel routes, the scope of passenger carrying authorizations, and the like. Seasonal limitations are intended to ensure the overall seaworthiness of the vessel and the safety of the passengers carried under differing operational conditions, without completely halting the operation of the vessel during any specific period of time.

c. Manning Requirements For Vessels Towing Inspected Passenger Barges. These should be indicated on the COI issued to the barge (see volume III of this manual).

d. Endorsements For Special Cargoes. The endorsements required by 46 CFR 36.01-5 and 38.01-5 should be made as indicated.

e. Endorsements Listing Cargo Names And Relief Valve Calculations. See 46 CFR 154.17. Such endorsements should also be made for liquefied gas cargoes regulated solely under 46 CFR Subchapter D.

5. Crew Requirements

Maintenance Persons

a. Maintenance Persons. Maintenance persons may be listed in one of the available slots for required manning under VFOD. A specific departmental affiliation may be included, e.g., engine maintenance person. The qualifications of a position, as appropriate, may be further specified under "Route Permitted and Conditions of Operation," e.g., deck maintenance person (any deck rating), engine maintenance person (junior engineer, electrician, deck engine mechanic), or maintenance person (any deck or engine rating). Whenever a maintenance person is listed without departmental affiliation, it is left to the master's discretion to determine where and how to use that person. This action:

(1) Allows the master and chief engineer a degree of latitude in determining the ship's internal organization; and

(3) Minimizes the possibility of direct Coast Guard involvement in labor-management contractual matters.

NOTE: See MSM Volume III for additional guidance.

Radio Officers

b. Radio Officers. When the requirement for a Radio Officer is solely to reinforce the Federal Communications Commission's authority, asterisk should be entered in the slot for "Radio Officer" under VFOD, with the following endorsement made under "Route Permitted and Conditions of Operation":

"If Required By the Federal Communications Commission."

Liquefied Gas Carriers

c. Liquefied Gas Carriers. The COI for a liquefied gas vessel should clearly state that the cargo officer and cargo systems engineer are non-watchstanders. A notation should be made under "Routes Permitted and Conditions of Operation" that "The chief mate shall be designated the cargo officer and be non-watchstanding" and "The (first or second) assistant engineer shall be designated the cargo systems engineer and be non-watchstanding." The latter designation should be made by the OCMI.

Certificated Engineering Personnel

d. Certificated Engineering Personnel. These should not be required on the COI's of river and other vessels exempted from this by 46 U.S.C. 8701 and 8702.

Statement of Minimum Complement

e. Statement of Minimum Complement. By law, the COI must state the minimum complement of licensed and certificated personnel necessary for the safe operation of the vessel; this requirement should be strictly complied with.

Radar Observer Endorsements

f. Radar Observer Endorsements. These are not considered necessary or desirable, except on certificates for hydrofoils or air cushion vehicles (see Volume III of this manual). The regulatory requirements are considered sufficient without other special notations.

I. TEMPORARY CERTIFICATE OF INSPECTION, FORM CG-854

This form, authorized by 46 U.S.C. 3309, provides evidence of the satisfactory completion of an inspection for certification. It has all the force and effect of a permanent certificate and permits operation of a vessel pending receipt of the permanent COI generated by MSIS. The temporary certificate is intended for use when the immediate issuance of a COI is not possible at the completion of an inspection; however, when the permanent COI can be issued in time to meet the vessel's needs, a temporary certificate should not be issued. It is not the Commandant's intention that a COI be withheld pending correction of minor deficiencies after a temporary certificate has been issued. Under no circumstances should this form be issued to a vessel that does not qualify for a COI. One copy of the temporary COI should be given to the vessel's master and the original retained in the OCMI's vessel file.

FORM CANCELLATION: Form CG-2801A, List of Merchant Vessels Under Construction or Conversion. Vessel owner/operators are no longer required to submit Form CG-2801A, List of Merchant Vessels Under Construction or Conversion. The Form had been used to record Coast Guard inspection resources expended upon new construction of inspected vessels, uncertificated Military Sealift Command vessels, or vessel conversions. It includes information concerning involvement by the American Bureau of Shipping under the Memorandum of Understanding dated 27 April 1982. This information historically has been used on an infrequent basis by Headquarters personnel, thus obviating the need for monthly submissions.

However, despite the infrequent use, the inspection manhours reported on the subject form are still very important as this information represents a significant expenditure of Marine Inspection (MI) program resources at many ports, particularly for new construction or conversion cases that may last for several months or years. The manhours are eventually used by Headquarters to substantiate both the billet structure in the MI program and future budget requests for resource allocations.

Therefore, each OCMI shall account for and maintain these MI resource expenditures at the local level. Upon certification, all manhours expended since the initial inspection began, including plan review manhours expended by the unit, shall be entered by inspection type into the case file in MSIS. All of the manhours should not be attributed to “initial certification.” If the vessel is not certificated, for whatever reason, the manhours expended shall be entered into the MSIS case before the case is closed to file, thereby enabling this information to be retrieved for reporting purposes. The importance of accurate, complete and timely MSIS data entry cannot be overemphasized, even for those cases in which a vessel is not certificated and the MSIS case is closed.

J. AMENDING THE COI

Amendments to COIs should be made through the MSIS system. In cases where amendments involving last drydock dates or other changes will require a reissuance and reprinting of a vessel's COI, handwritten reinspection entries on the COI will be lost when the COI is reissued. To alleviate the loss of these entries on a reissued COI, an amendment should be made to the COI in MSIS whenever a reinspection is conducted. This will ensure that reinspections are recorded when COIs are reissued for any reason.

K. APPLICATION FOR WAIVER AND WAIVER ORDER, FORM CG-2633

This form shall be completed and submitted as required by 46 CFR 2.45 and as indicated on the form itself. Copies of waivers issued shall be forwarded to Commandant (G-MOC), as required by the subject matter. When the waiver is referred to the Commandant for action, the OCMI should submit a forwarding letter explaining the circumstances of the case.

L. PERMIT TO PROCEED TO ANOTHER PORT FOR REPAIRS, FORM CG-948

➔ See MSM Volume II, Section C, Chapter 4 (MSM II-C4).

M. PERMIT TO CARRY EXCURSION PARTY, FORM CG-949

1. Purpose

Form CG-949 should be used by the OCMI to allow a vessel to engage in a temporary excursion operation not permitted by its COI. This occurs when a passenger vessel is permitted to carry extra passengers or to operate on an extended route, or when a cargo or miscellaneous vessel is permitted to carry recreation parties on a 1-day basis. The permit should be issued for a limited period of time only, and should be considered a temporary supplement to the COI. The word "temporary" is stressed; an Excursion Permit should not be used as a device to circumvent normal inspection requirements.

2. Distribution

Form CG-949 should be executed in triplicate. The original copy should be issued directly to the master, operator, owner, or agent of the vessel; one copy forwarded to Commandant (G-MOC) via the appropriate district commander (m); and one copy retained by the OCMI. Additional copies may be obtained by the master, operator, owner, or agent of the vessel upon written request to the OCMI.

N. SOLAS CERTIFICATES

1. Passenger Ship Safety Certificate (PSSC), Form CG-968

The number of small passenger vessels which have been certificated with international routes has steadily increased. When certificated for an international route, these vessels, in addition to the COI, require a PSSC issued in accordance with SOLAS 74/83. See MSM II-E2.I regarding small passenger vessels subject to SOLAS.

Notification of Approval for SOLAS PSSC, Form CG-969A

a. Notification of Approval for SOLAS PSSC, Form CG-969A. Upon satisfactory completion of the initial inspection for certification for a vessel desiring an international route, the OCMI should submit Form CG-969A to Commandant (G-MOC); it is normally accompanied by Federal Communications Commission (FCC) Form 806. Except for primary lifesaving equipment, only equipment required by SOLAS should be entered on the form.

SOLAS Exemption Certificate, Form CG-967

b. SOLAS Exemption Certificate, Form CG-967. Exemptions granted by the OCMI in accordance with Regulations II-1/1(c), II-2/1(e) and III/3(a) of SOLAS 74/83 should be listed on the reverse side of Form CG-969A. This information should be included at the time of the initial inspection for issuance of a PSSC. The Exemption Certificate is issued in conjunction with the PSSC or a Cargo Ship Safety Equipment Certificate (Form CG-3347).

Issuance of PSSC and Exemption Certificates

c. Issuance of PSSC and Exemption Certificates.

(1) Initial Issue. Commandant (G-MOC) issues the initial PSSC and Exemption Certificates based upon the information provided on Form CG-969A. The originals of the certificates, with copies, are forwarded to the certificating OCMI for distribution. The following statement shall be entered in the upper right section of the PSSC:

> "The below mentioned survey showed that this ship complied with the requirements of the below regulations or equivalent provisions accepted by the Government of the United States of America and substituted, therefore, in accordance with Regulation I/5 and reported in IMO SLS.14/CIRC.87 of 15 November 1989 (copy attached)."

A copy of IMO SLS.14/CIRC.87 shall be attached to the PSSC. Vessels receiving safety certificates under this arrangement shall be issued one year Certificates of Inspection (COI) to correspond with the PSSC. These vessels shall have drydock examinations at least once every 12 months. The international route authorized must be specified on the COI. If applicable, the vessel shall have the appropriate Load Line Certificate. Compliance with, or exemption from, SOLAS radiotelegraphy and radiotelephony requirements must be verified by the Federal Communications Commission (FCC). Copies of PSSCs issued under this arrangement shall be forwarded to Commandant (G-MOC).

(2) Subsequent Issue. The OCMI is authorized to reissue subsequent recurring SOLAS PSSC's and Exemption Certificates. If any changes to the exemptions originally granted by the OCMI have been made, they must be submitted to Commandant (G-MOC) for approval, in which case the certificates will be treated as an initial issue. Copies of reissued certificates should be forwarded to Commandant (G-MOC).

2. SOLAS Cargo Ship Safety Certificates

a. Introduction. Cargo vessels and tankships of 500 and more gross tons that engage in international voyages are subject to SOLAS and are required to have the following SOLAS certificates as applicable:

(1) Cargo Ship Safety Construction Certificate, CG-4359 (Rev. 2-80).

(a) Supplement to the Cargo Ship Safety Construction Certificate, CG-4359-A (Rev. 2-81).

(2) Cargo Ship Safety Equipment Certificate, CG-3347 (Rev. 06-93).

(a) Supplement to the Cargo Ship Safety Equipment Certificate, CG-3347A (Rev. 2-81).

(b) Attachment to the Cargo Ship Safety Equipment Certificate, CG-3347B (Rev. 06-93).

b. Cargo Ship Safety Construction Certificate (SAFCON). This certificate may be issued, at the owner's option, by either the Coast Guard or the American Bureau of Shipping on behalf of the Coast Guard. This certificate should be issued at the completion of a vessel's drydock exam with a period of validity of five years from the date of issue. When issued by the ABS, the ABS should provide the supplement and endorse the certificate as necessary. When issued by the Coast Guard, the distribution should be the same as for the vessel's COI.

c. Cargo Ship Safety Equipment Certificate (SEC). The SEC should be issued by the Coast Guard at the completion of a vessel's inspection for certification to expire when the COI expires. Except for primary lifesaving equipment, equipment required by SOLAS and actually on board should be noted by numbers of items present on the SEC form; equipment required by SOLAS but not on board should be noted by a zero. SOLAS certificates are not to contain asterisks or notes indicating requirements or shortages. The Exemption Certificate noted above is necessary to reflect equipment omissions or authorized shortages.

d. Attachments. Attachments to the SEC and the SAFCON are forms generated by the International Maritime Organization (IMO) for issuance to cargo ships, including tankships, to indicate the completion of either unscheduled or mandatory annual surveys. Since SOLAS 74 became binding, the IMO has generated two attachments for the SEC and one for the SAFCON.

(1) An attachment for each certificate was developed for the 1978 SOLAS Protocol. A provision in that Protocol allowed the use of endorsements in lieu of the attachments. The Coast Guard chose to use such endorsements and not issue the attachments. For surveys relating to the 1978 SOLAS Protocol, the following endorsement is to be typed or stamped on the reverse of a SEC or SAFCON issued by the the Coast Guard:

"In implementation of Regulation 6(B), Chapter I of the Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, 1974, the Government of the United States of America has instituted mandatory annual surveys."

Mandatory Annual Survey

Place Date

U.S. Coast Guard

NOTE: The SAFCON should have space for three mandatory annual surveys.

(2) A second attachment to the SEC (noted in N.2.a.(2)(b) above) was developed to show compliance with the 1983 SOLAS Amendments. This attachment is issued by the Coast Guard at the time the SEC is issued, is considered to be a part of the SEC, and has an expiration date the same as the SEC. Paragraph II of the SEC is to be left blank with an asterisk to refer to this attachment.

e. Supplements. The supplements to the SEC and SAFCON certificates, listed in paragraph N.2.a.(1) and (2) above, are to be issued to tankships of 10,000 or more GT or 20,000 or more DWT, and to those 10 years and more of age. The supplement is considered to be a part of the relevant certificate to which it refers, and their dates of expiration should coincide.

O. CONTROL VERIFICATION EXAMINATIONS, FORM CG-4504

Upon satisfactory completion of an examination, the OCMI may issue Form CG-4504 to vessels of countries that are parties to the SOLAS Convention, which carry passengers (persons in addition to the crew) from U.S. ports, and to vessels of countries with which the United States has reciprocal inspection agreements (MSM II Section D concerning examination of foreign vessels). This form should be distributed in the same manner as the COI for U.S. flag vessels.

1. MSIS Entries for Initial or Annual Examinations

These examinations are to be recorded in MSIS as follows:

a. Schedule these examinations in Marine Inspection Scheduler Function as a Certificate of Compliance (Code "COC") inspection.

b. Record completion of the examination in Marine Inspection Activity Report. For the initial examination, enter a remark in comment section indicating this fact.

c. Record deficiencies in Marine Inspection Deficiency Report (MIDR) so that deficiencies can be tracked/recalled by other ports for vessels that call on more than one port. Outstanding deficiencies, and any deficiencies corrected during the inspection that may have affected the seaworthiness of the vessel, or are of an unusual or complex nature that may indicate a problem with a system or item on other vessels, should be entered into MIDR as soon as possible. Entering deficiencies corrected during the inspection utilizes the safety performance tracking capability afforded by MSIS. Deficiency notification letters generated automatically by MSIS may be forwarded to the vessel operator at the discretion of the OCMI.

d. Update Marine Inspection Status Details to record revised validity dates.

2. MSIS Entries for Quarterly Re-Examinations

These examinations are to be recorded as follows:

a. Schedule these examinations in Marine Inspection Scheduler Function as "OTHER."

b. Record completion of the examination in Marine Inspection Activity Report, indicating the time spent conducting the examination under inspection type "COC."

c. Record discrepancies in Marine Inspection Deficiency Report.

P. IMO CERTIFICATES OF FITNESS (COF)

Regulations have been published for the carriage of hazardous liquid cargoes by self-propelled vessels (46 CFR 153) and for the carriage of bulk liquefied gases by self-propelled vessels (46 CFR 154). These regulations implement the IMO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH) (Resolution MSC.9(53)) and the IMO Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Resolution A.328(IX)), respectively. For ships built after 1 July 1986, two additional IMO Codes were developed and made mandatory under SOLAS. These are the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (ICB) (Resolution MSC 4(48)) and the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Resolution MSC 5(48)). Each of these codes provides for the issuance of COF's to vessels that comply with the standards of these codes.

1. Considerations for Application

There are some liquefied gas ships that, due to their early date of construction, are not subject to the IMO Gas Code (Resolution A.328(IX)). IMO Resolution A.329(IX), adopted 12 November 1975, provides that gas ships delivered after 31 October 1976, but prior to implementation of the IMO Gas Code, shall be reviewed in accordance with the provisions of the code to a reasonable and practical extent. Moreover, it was recommended that these vessels be issued an IMO Gas Code COF, with endorsements listing the specific provisions of the Gas Code with which they do not comply. See chapter 26 of this volume concerning the carriage of hazardous materials and chapter 28 concerning the carriage of bulk liquefied gases.

2. Issuance

COF for The Carriage of Liquefied Gases In Bulk, Form CG-5148

a. COF for The Carriage of Liquefied Gases In Bulk, Form CG-5148.

(1) Upon request from the master, owner, or agent of a vessel that complies with the Gas Code, the OCMI should issue a COF for a period not to exceed 2 years, dated to expire with the vessel's COI and SOLAS Cargo Ship Safety Equipment Certificate. It should be endorsed to indicate compliance with the International Gas Carrier Code (Resolution MSC 5(48)) if the vessel complies with that Code.

(2) For a vessel not subject to the Gas Code, Annex 4A of the certificate should be used to list those areas of the IMO Gas Code with which the vessel does not comply, and it should be attached to the COF.

COF for the Carriage of Dangerous Chemicals in Bulk, Form CG-5148A

b. COF for the Carriage of Dangerous Chemicals in Bulk, Form CG-5148A. Upon request from the master, owner, or agent of a tank vessel that complies with the IMO Chemical Code, the OCMI should issue Form CG-5148A. The certificate should be issued for a period of 2 years, dated to expire with the vessel's COI and SOLAS Cargo Ship Safety Equipment Certificate. The COF should be endorsed to indicate compliance with either the BCH or the IBC, whichever applies.

3. Certificate Entries

Many of the entries on Forms CG-5148 and CG-5148A require data developed during the technical review process. The MSC will tabulate the data required for the certificate as it is developed and forward it to the cognizant OCMI. This will avoid lengthy file searches when the vessel is ready to be certificated.

4. Copies Required and Distribution

Forms CG-5148 and CG-5148A should be prepared with sufficient copies for the following distribution:

(a) Original: Issued to the master, owner, or agent of the vessel, to be maintained on board the vessel;

(b) 2 Copies: To Commandant (G-MOC), via District (m);

(c) 1 Copy: Issuing OCMI's file copy;

(d) 1 Copy: To Marine Safety Center for vessel file; and

(e) 1 Copy: To owner or agent of the vessel (if requested).

Q. VESSEL INSPECTION RECORD CARD, FORM CG-2832

Form CG-2832, in addition to the MSIS Pre-Inspection Package (MSPIP), provides the inspector with ready information as to the inspection status of a specific vessel when it is boarded for various inspections. Recent inspection information from a previous port, that may not yet be entered into MSIS, should be recorded on this form. The use of this form in no way diminishes the discretion of the OCMI regarding types or frequency of inspections. Rather, it is a tool with which the OCMI can better determine the need for further inspections. This form shall be carried on ocean and coastwise cargo vessels (including tank vessels) of 500 or more GT, and ocean and coastwise passenger vessels of any gross tons (except those inspected under 46 CFR, Subchapter T). It shall be posted in the pilothouse in a suitably installed frame.

1. Entries

At the conclusion of each inspection, the inspector should enter the type of inspection conducted, pertinent remarks, drills conducted, port of inspection, his/her signature, and date. Each inspector who boards a vessel should examine this record to learn what inspections have been made, to verify the correctness of the inspection status in MSIS, and to determine whether any further inspections are necessary. Entries should be made in ink and in accordance with the instructions printed on the form and the policy below.

Initial Entries

a. Initial Entries. Upon completion of the inspection for certification, the form should be filled out by the inspector and posted in the installed pilothouse frame. When a vessel is permitted to proceed to another port before inspection is completed, the initial inspector should enter "Began" and the type of inspection and date (e.g., "Began Biennial Inspection"). When a subsequent inspector has completed the inspection, that inspector should enter on a new line "Completed" and the type of inspection (e.g., "Completed Biennial Inspection"). When another type of inspection, such as a drydock examination or a lifeboat weight test, is performed during the course of the inspection for certification, only the entry "Annual Inspection" or "Biennial Inspection" should be made.

Subsequent Inspections

b. Subsequent Inspections. At the completion of each reinspection, an entry should be made on a new line under "Type of Inspection." When two or more distinct inspections are conducted at the same time, all should be entered on the same line if possible. In the case of continuing inspections involving more than one port, only those parts of the inspections that are completed at a port should be entered on the same line. Individual visits made during the course of an inspection should not be entered.

Remarks

c. Remarks. Here, information that will aid subsequent inspectors should be entered. For example, when inspections incidental to repairs are made, a brief entry should be made indicating the nature of the repairs or alterations. If all tanks or cargo holds are not entered and inspected during a biennial inspection, those tanks or holds that were should be listed; for drydock examinations, sea valves that were opened and inspected should be indicated. In addition, when a vessel is permitted to sail with outstanding deficiencies after any type of inspection, an entry should be made to inform subsequent inspectors.

Drills

d. Drills. Both columns should be checked for every entry, even when the type of inspection is defined as including one or both drills. When a fire or boat drill is held independent of another inspection, the inspector should enter "Drills" in the first column and appropriate notations in the other columns.

Port, Signature, and Date

e. Port, Signature, and Date. These should be entered upon completion of the inspection. Only the inspector making the entry should sign the card, even when two or more inspectors participate in the total inspection.

Transferred Information

f. Transferred Information. If lifeboat weight tests are not conducted at the time that a new Form CG-2832 is posted, the date of the last weight test and the port where the test was witnessed should be transferred to the new card. Likewise, when remarks on the old card concerning cargo tanks, cargo holds, or sea valves have not changed, the information should be transferred. This information should be the first entry on the new card and should be signed by the inspector.

Additional Cards Required

g. Additional Cards Required. To reflect all inspections of the vessel, it may be necessary to keep extra blank Vessel Inspection Record Cards on board the vessel.

2. Disposition of Outdated Cards

After the inspection for certification, the previous Vessel Inspection Record Card(s) may be destroyed or placed in the OCMI's file.

R. MOBILE OFFSHORE DRILLING UNIT (MODU) SAFETY CERTIFICATE, FORM CG-5334

The OCMI issues this form to MODU's that comply with the applicable provisions of IMO Resolution A.414 (XI) (known as the "MODU Code"), adopted on 15 November 1979, upon request by unit operators. Distribution should be the same as for a COI. Except for primary lifesaving equipment, only that equipment required by the IMO MODU Code and actually aboard should be entered in paragraph 3 of the form (e.g., 2 lifeboats for 80 persons, 4 inflatable life rafts for 80 persons, 84 life jackets, and 8 life buoys). Exemptions granted in accordance with section 1.4 of the Code should be listed in paragraph 4 of the form. If additional space is needed to complete these paragraphs, the reverse of the form may be used.

S. TRACKING ITEMS OF SPECIAL NOTE AND SPECIAL DESIGN FEATURES IN MSIS

One of the primary advantages of MSIS is that it provides the OCMI with the ability to call up a particular vessel, whether U.S. or foreign flag, and obtain a readout of the inspection history of that vessel.

1. Special Inspection Notes (MISN)

When conditions are discovered during an inspection that should be highlighted for scrutiny at later inspections, a MISN should be filed. The MISN is assigned a "Retain Until" date, thereby limiting the length of time that the MISN can be kept on file.

2. Vessel File Design Details (VFDD)

Based upon the plan review of a vessel, the Marine Safety Center (MSC) may advise the OCMI of special design features on a vessel that require an entry into MSIS under VFDD. Conditions of particular note on a vessel must be made a permanent part of the vessel's MSIS inspection file by entering as Special Design Feature under VFDD at initial or subsequent inspections, as appropriate. For vessels that travel to, and are inspected by, different zones, the Special Design Features will alert the OCMI to the particular conditions that must receive specific attention by the inspector at each inspection.

Special Design Features

a. Special Design Features. Technological advances in the design, construction and outfitting of vessels frequently outdate specific requirements in existing regulations. For example, new types of insulating and fire-resistant materials enable designers to outfit and furnish vessels, particularly passenger vessels, such that the fire load is reduced to as low as 1 lb/sq ft (Per NVIC 6-80, it has been the philosophy of the Coast Guard to design the structural fire protection regulations for shipboard spaces based upon a fire load of 10 lb/sq ft, except for spaces containing fire-resistant furnishings). For this reason, Commandant (G-MSE) and (G-MOC) have granted equivalencies where new technology has produced equipment or systems that were not considered at the time applicable regulations were written, but which meet the intent of the regulations. These equivalencies usually require the owner or operator of the vessel to maintain certain conditions on board the vessel (such as a fire load of 1 lb/sq ft cited in the example above). Special Design Features in a MSIS will alert the inspector to these special conditions.

Structural Deficiencies

b. Structural Deficiencies. Reviews of Form CG-2752, Report of Structural Failure, Collision Damage or Fire Damage to Inspected Vessel, and other casualty studies have revealed that a particular vessel, or a particular class of vessels, may experience initial or recurring structural failures due to either poor design or repair techniques. When these conditions are found, Commandant should be notified of these conditions (MSM II-A5 concerning structural failure reports), and they should also be made a permanent part of the vessel's inspection record under VFDD. Structural deficiencies that are identified as a class problem by Commandant will be noted by Commandant (G-MOC) for all vessels within that class.

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CHAPTER 4: APPROVAL OF PLANS AND SPECIFICATIONS

A. INTRODUCTION

The Commandant is tasked with the responsibility to determine that vessels subject to inspection meet the applicable sections of the regulations. The primary means of carrying out this task, in addition to actual inspection of a vessel by field units, is by review and approval of vessel plans and specifications. The general requirements for plans, drawings, or blueprints are found in 46 CFR 2.90-1. Specific recommended practices and procedures for the submittal of plans and specifications are detailed in NVIC 8-84.

B. SUBMITTAL PROCEDURES

Plans may be submitted to the OCMI, the Marine Safety Center (MSC), Commandant (G-MOC), or to the American Bureau of Shipping (ABS) in accordance with NVIC 3-84 or the Memorandum of Understanding between the Coast Guard and ABS as discussed in NVIC 10-82, CH-2.

1. Submittal to the OCMI

When the OCMI receives a set of plans, he should determine the extent of the new construction or conversion project and decide whether he or the MSC will review the plans. In many cases, the 0CMI may determine that he does not have either the personnel or the technical resources to conduct plan review. In such instances, the plans should be examined for the presence of any items that warrant special attention, and then forwarded to the MSC for review. When plans are reviewed by the OCMI, they should be stamped "Approved," "Disapproved," "Return for Revision" or "Examined." The stamp should include the date and the OCMI's signature. At least one set of the plans should then be returned to the originator with a cover letter that includes any outstanding comments. At least one set of the plans should be retained on file by the OCMI.

2. Submittal to the MSC

Plans may be submitted directly to the MSC. Whenever this is done, the MSC normally will not begin plan review until receipt of an application for Inspection for Certification by the cognizant OCMI has been confirmed. Three copies of each plan should be submitted to the MSC for review. Upon completion of plan review, one set of the plans with the comment letter will be returned directly to the originator, one set will be retained by the MSC, and a third set will be forwarded to the OCMI having jurisdiction over the vessel. In view of the proximity to and personal knowledge which the OCMI may have of the vessel and its intended service or operating area, the OCMI may determine that certain items do not comply with applicable regulations or do not provide the degree of safety required. In these cases, the MSC should be notified promptly of any items that the OCMI considers worthy of special consideration or reconsideration. OCMI's are encouraged to communicate with the MSC or Commandant (G-MOC), as appropriate, when requests are received for inspection of new construction, major repairs, or conversions for which approved plans and related correspondence are not held.

3. Submittal to ABS

The provisions of NVIC's 10-82, Change 2, and 3-84 apply.

C. PLANS AND SPECIFICATION DESIGNATIONS

Whenever plans of inspected vessels are submitted, they must be identified by vessel name and official number whenever known. In the case of a new vessel, designation by shipyard work order number or hull number is sufficient until the vessel name is known; then the vessel's name shall also be given. In the conversion of an existing vessel, the new name shall be given whenever known, as well as the former name and type designation. Tank vessel plans shall be accompanied with information concerning the grades of liquid cargo the vessel will carry and its proposed service. Tank barges shall also be designated as manned or unmanned.

D. SPECIAL SUBMITTAL PROCEDURES

1. Submittal of Electrical Plans

Submittal to the OCMI

a. When electrical plans required by 46 CFR 110.25 are submitted to the OCMI, the following plans are to be forwarded to the MSC for action:

(1) Switchboard wiring diagram;

(2) Switchboard material and nameplate list;

(3) Elementary wiring diagram of metering and automatic switch gear;

(4) Description of operation of propulsion control and bus transfer switch gear;

(5) Elementary one-line wiring diagram of power system;

(6) Electric plant summary showing connected loads and calculated operating loads for various conditions of operation;

(7) Elementary wiring diagram of steering gear alarm circuits and ventilation shutdown control general alarm system and fire protection system;

(8) Elementary wiring diagram and isometric or deck wiring diagrams of electric watertight door system and power operated lifeboat winches; and

(9) Hazardous locations drawing.

Review by either OCMI or MSC

b. Other plans listed in 46 CFR 110.25 not listed above may be acted upon directly by the OCMI, or they may be transmitted to the MSC for action.

Revisions to Plans

c. Subsequent revisions of the plans listed above may be acted upon directly by the OCMI, or they may be submitted to the MSC for action. When major changes or revisions are made on these plans, they must be forwarded to the MSC for action.

2. Submittal of Cargo Gear Plans

Plans for cargo gear that have been reviewed and approved by ABS or the International Cargo Gear Bureau, Inc. (ICGB) need not be submitted to the Coast Guard for further review and approval.

3. Submittal of Boiler Plans

Boilers must be designed in accordance with 46 CFR Parts 52 or 53. These parts adopt section I and section IV of the American Society of Mechanical Engineers (ASME) Code with modifications to account for the marine environment. It is imperative that the additional requirements in parts 52 or 53 be identified and met in the design stage to avoid possible rejection of the boiler during installation. For boilers constructed in accordance with 46 CFR Part 52, plans and calculations must be certified by a registered professional engineer (RPE) licensed by one of the fifty states of the United States, the District of Columbia, or U.S. Territories. The RPE's license should be current at the time he certifies any plans or calculations. The RPE's certification must appear on each design drawing and on the front page of the design calculations. In addition, the professional engineer should provide a signed statement that the boiler meets the applicable Coast Guard design requirements. The plans must be submitted as early as possible to the MSC for review prior to installation of the boilers. The plans will be reviewed only to the extent necessary to establish that the correct procedures for design certification are being followed. For boilers constructed in accordance with 46 CFR Part 53, plans and calculations are not required to be submitted. Boilers which are automatically controlled must have their control plans approved (see 46 CFR Part 63).

4. Submittal of Pressure Vessel Plans

Requirements

a. Plans and calculations for Class I-L and II-L pressure vessels, and for those pressure vessels that contain hazardous materials, must be submitted to the MSC for approval. For other pressure vessels, see 46 CFR 54.01-5 and 54.01-15 for the applicable guidance. Plans required to be made available to the inspector under 46 CFR 54-01-5(e) need only be requested for pressure vessels of unusual design, service or pressure.

Certification by a RPE

b. A RPE may certify a sepia or original drawing, provided the date of certification is also included. Blueprints made from a certified sepia or original drawing are acceptable provided the copy of the RPE's certification is legible. Some RPEs certify a plan by stamping it; others by signing and dating a plan and then embossing the signature with a raised seal. If the certification is done with a raised seal on the original plan (sepia, etc.), then the information contained thereon must be reproducible on all copies.

Method of Certifying Plans

c. All plans shall be certified by the RPE that they are in compliance with section VIII, division 1 of the ASME Code as modified by 46 CFR Part 54. There are no requirements as to the specific wording that must be used by the RPE in making this certification. The certification may appear on the original plan, from which copies may be made, or the RPE may place an original signature and certification on copies of each plan. It may also appear on each page of the calculations, or there may be one certification for the entire set of calculations. The method of certification should be to the satisfaction of the OCMI, but it is recommended that a consistent method be used that either provides for each plan being notated, or a certification statement be made on a cover letter that includes a list of all applicable plans by number, title and revision or alteration.

Alterations

d. Alterations and revisions to plans are to be dated. Those revisions which are made to a plan after it is certified by a RPE, but before the pressure vessel is installed, must be checked and again certified by the RPE as being in compliance with the Code and part 54. Alterations or repairs to pressure vessels which have been put into service need not be certified by a RPE, but are to be approved and inspected by the cognizant OCMI.

5. Submittal of Structural Fire Protection Plans for Certain Small Passenger Vessels

Structural fire protection plans for new construction small passenger vessels that will either carry more than 150 passengers or which have overnight accommodations for more than 49 passengers are to be submitted to the MSC for action.

Plans Returned for Revision

a. In cases where the MSC finds major or numerous minor structural fire protection deficiencies, the plans are returned to the owner or designer by the MSC for revision. This is equivalent to a requirement issued by the CO, MSC, to the effect that he is not satisfied with the existing design and changes must be made to meet compliance with the regulations. Appeals or questions concerning the extent of design changes required are to be directed to the MSC. The MSC should consult with the OCMI when resolving appeals or considering requests for equivalency.

Plans Approved, with Comments

b. When numerous minor deficiencies exist or areas remain that are unclear to the plan reviewer, but can be resolved more readily by the OCMI, the plans are marked "Approved with Comments" and forwarded to the cognizant OCMI. At this point the CO, MSC has completed action on the plan and the responsibility for assuring compliance and resolving comments shifts to the OCMI. The OCMI then has the discretion to either require compliance with the MSC's comments, or to accept alternate arrangements that satisfy the intent of the regulations. Questions of compliance with comments forwarded with an approved plan, and appeals of inspection issues are properly addressed to the OCMI.

Resolving Outstanding Deficiencies.

c. During the final inspection for certification, the status of all structural fire protection plan submissions should be verified by the responsible inspector. If any plans remain that are still marked "Return for Revision," it is incumbent upon the OCMI and the MSC to work closely together to determine the status of any outstanding deficiency, and the necessary corrective action to be taken. Serious deficiencies should result in either a delay in certification until the plans are revised and approved and the deficiency corrected, or the issuance of a CG-835 to complete the plan review process and make any necessary modifications within a specified period of time. Restrictions on the number of passengers authorized may also be appropriate.

6. Submittal of Plans for SOLAS Foreign Passenger Vessels

Vessels Over 100 Gross Tons

a. Plan review is considered a matter of routine for those foreign flag vessels over 100 gross tons having berth or stateroom accommodations for at least 50 passengers. 46 USC 3505 prevents a foreign vessel from departing a U.S. port with passengers embarked if the Secretary determines that the vessel does not comply with SOLAS. NVIC 1-85 addresses the procedures for plan submittal in verification of a vessel's compliance with the applicable fire safety standards. This plan review, although not required by law or regulation, is essential to the timely conduct of the initial examination. If the owner/operator/builder fails to take advantage of this opportunity, it is likely that a full and thorough inspection cannot be performed without significant delay. When an OCMI has advance knowledge of an initial U.S. voyage of a vessel in this category, he should make known to the appropriate vessel representatives the importance of plan submission. See chapter 20 for additional information on foreign passenger vessels.

Lead Time

b. Plans should be submitted to the MSC at least 45 days prior to arrival of the vessel at its first U.S. port of call. Earlier submission is encouraged, but should not be more than 90 days.

Verification

c. The plan review conducted by the MSC is to verify, not approve, compliance with the applicable standards and to facilitate the initial examination. Thus, plans submitted to the MSC should indicate Flag Administration approval. Upon completion of both fire safety and stability plan review, the MSC will forward the results to the OCMI with the plans. The submitter will also be advised of the results, particularly if deficiencies are noted or more information is required.

Conceptual Review

d. If, in the design stage or early in the construction stage, an owner or builder wants to discuss design to ensure acceptance, they should be directed to G-MOC for conceptual review. Where vessels have employed novel design features based on interpretation of SOLAS, even timely plan review under NVIC 1-85 may not ensure the vessel will be acceptable for U.S. operations. Thus, the OCMI should encourage contact with G-MOC early in the design or construction phases, if known to him/her, unless deemed clearly unnecessary.

E. SEQUENCE OF PLAN SUBMITTALS

1. General Requirements

For the proper evaluation of construction plans for a vessel, it is essential that the following basic plans for all vessels, except those inspected under 46 CFR, Subchapter T, be forwarded prior to submittal of the other plans listed in 46 CFR:

a. Specifications (hull, machinery, and electrical);

b. General arrangement plans;

c. Midship section;

d. Lines;

e. Curves of form;

f. Calculation of intact stability;

g. Capacity plan; and

h. One-line wiring diagram of electrical system.

2. Passenger Vessels

In the case of passenger vessels inspected under Subchapter H, the following additional plans shall also be submitted:

a. Floodable length curves;

b. Calculations of stability in intact and final flooding conditions; and

c. Fire control plan.

F. PLANS FOR IDENTICAL TANK BARGES

Construction of a barge is sometimes identical in structure and piping to that of a previously approved barge. To avoid duplication and unnecessary submittal of plans, the following procedures should be followed:

1. Proposed Barges

Only general design, hull structure, electrical, and piping plans need be submitted to the MSC for approval.

> **NOTE:** The barge must be built in the same yard as the first one.

2. Extensions of Approvals

When a barge is identical in construction to one previously approved, it is not necessary to submit plans for it. Extension of the existing barge's approval can be given for the new barge by letter from the cognizant OCMI. The MSC should be informed of the new barge's hull and contract numbers so that its records can be kept current.

3. Non-structural Details

The details of construction of any barge, such as connections or deck fittings, that do not involve the vessel structure need not be submitted to the MSC for action, but may be approved by the OCMI.

4. Alterations

When construction previously approved is changed by a significant alteration, the plans referred to in subparagraph F.1 above should be resubmitted to the MSC for consideration. The significance of the alteration is to be determined by the OCMI on the merits of the particular case.

G. APPROVAL PROCEDURES

The information provided below is in addition to the requirements for these plans contained in the applicable subchapters of 46 CFR and various sections of 33 CFR. These standards are suitable for typical vessels. When reviewing plans for a vessel of unusual form, arrangement, or construction, the same degree of safety as established in these standards must be maintained.

1. Passenger Vessel Plans

General Standards

a. The ABS Rules for Building and Classing Steel Vessels will generally be accepted as a standard for the review of structural plans for the construction, alteration, or repair of typical passenger vessels.

Uses of Insulation and Covering Materials

b. Approved structural insulation, bulkhead panels, and deck coverings may be used to achieve various structural fire protection classifications for steel bulkheads and decks required by 46 CFR 72.05. To provide information for shipbuilders and others concerned, a "Guide to Structural Fire Protection Aboard Merchant Vessels," has been published. The sketches accompanying this NVIC show the types, thicknesses, and relative positions of materials necessary to meet Class A-60, A-30, or A-15 requirements. Class A-0 construction is not included because no insulation is required on structural steel bulkheads or decks to meet Class A-0 requirements. Since it is obviously impossible to anticipate all combinations of materials which might be used, approval will be given to arrangements differing from these sketches if equivalent integrity and heat transmission qualities are provided. Approved insulation, bulkhead panels, and incombustible materials are listed in the Equipment Lists, Commandant Instruction (COMDTINST M16714.3, previously CG-190). Current changes are published in the Federal Register and the Federal Register reprint

2. Cargo and Misc. Vessel Plans

The ABS Rules for Building and Classing Steel Vessels or Rules for Building and Classing Steel Vessels under 61 Meters (200 Feet) in Length will generally be accepted as a standard for the review of structural plans for the construction, alteration, or repair of cargo and miscellaneous vessels.

3. Mobile Offshore Drilling Units (MODU's)

The ABS Rules for Building and Classing Mobile Offshore Drilling Units (MODU's) and Det Norske Veritas Rules for Classification of Mobile Offshore Units will generally be accepted as standards for the review of structural plans for the construction, alteration, or repair of MODU's.

4. Tank Vessel Plans

Plan Approval

a. The ABS Rules for Building and Classing Steel Vessels will generally be accepted as a standard for the review of structural plans for the construction, alteration, or repair of tank ships. The ABS Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways and the Rules for Building and Classing Steel Barges for Offshore Service are accepted as standards for the determination of scantlings for tank barges.

Construction Details Affecting Cleaning/Gas-Freeing of Cargo Tanks

b. Particular care must be taken to avoid any arrangement of the structural members that would prevent effective cleaning or gas-freeing of a liquid cargo tank. Adequate provisions should be shown for drainage in all longitudinal and transverse members within a tank. Any arrangement of longitudinals, stiffeners, skegs, bilge keels, fenders, or other members that results in the creation of a possible gas pocket, either in the cargo tanks or in areas contiguous to these tanks, may not be approved.

5. Plans for Scuppers, Sanitary Discharges, Tank Overflows, Overboard Discharges, Etc.

Explanatory discussions and sketches of installations that will be approved are set forth in various NVIC's. Proposed methods other than those specifically illustrated in these NVIC's may be approved if they meet the applicable requirements of 46 CFR 56.50-95.

CHAPTER 5: VESSEL CONSTRUCTION, CONVERSIONS, ALTERATIONS, AND REPAIRS

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CHAPTER 5: VESSEL CONSTRUCTION, CONVERSIONS, ALTERATIONS, AND REPAIRS

A. INTRODUCTION

The inspection of a vessel during construction or conversion is normally considered an initial inspection. The scope of such inspections and the standards for construction of vessels and equipment are covered in the applicable regulations. (See MSM II A4 concerning approval of plans and specifications, and MSM II B1 concerning inspection of vessels for certification.) Inspections shall be made during the progress and upon completion of the work, as necessary, to determine that the vessel may be safely operated in the service in which it is employed. Reports or inspections by the officer in charge, marine inspection (OCMI) are not required when minor repairs by replacements with spare parts are made. However, when repairs are accomplished in a foreign port or under emergency conditions at sea, they must be reported to the OCMI at the first port where the vessel calls after such repairs are made. The OCMI shall verify the efficiency of the repair and determine whether it should be considered a temporary or permanent repair. The extent of this inspection should depend on the reported conditions. Whenever feasible, extensive examinations or tests (such as for boilers) may be delayed until the next periodic inspection. Final acceptance of repairs shall not be made until the OCMI is satisfied that all aspects are satisfactory.

B. REFERENCES

1. Regulations

Requirements for notifying the Coast Guard of repairs or alterations affecting the safety of a vessel or its machinery, or movement of a vessel to another port for repairs, are contained in 46 CFR 2.01-15. The following regulations also require that the OCMI be notified of repairs or alterations affecting the safety of the vessel and mandate, if the vessel is subject to inspection, that inspections be held:

	TYPE	CFR CITE
a.	Tank Vessels	46 CFR 31.10-25
b.	Marine Engineering	46 CFR 50.05-10
c.	Passenger Vessels	46 CFR 71.55
d.	Cargo and Miscellaneous Vessels	46 CFR 91.45
e.	Electrical Engineering	46 CFR 110.25
f.	Public Nautical School Ships	46 CFR 167.30-1
g.	Subdivision and Stability	46 CFR 170.005
h.	Small Passenger Vessels	46 CFR 176.120 (Sub T) 46 CFR 115.120 (Sub K)
i.	Oceanographic Research Vessels	46 CFR 189.45-1

2. American Bureau of Shipping (ABS) Publications

The ABS has produced numerous publications that contain requirements and instructions for the production of sound, effective hull welds. Rules for Building and Classing Steel Vessels and Rules for Building and Classing Steel Barges for Offshore Service are examples of these publications, which are generally accepted by the Coast Guard as standards (See MSM II A2.G for a list of ABS publications).

3. American Society of Mechanical Engineers (ASME) Code

46 CFR 57.02-1 states that the Coast Guard has adopted Section IX, "Welding and Brazing Qualifications," of the ASME Code, with certain limitations and modifications. Section IX, as modified by 46 CFR 57, is used as a standard for judging the quality of piping and machinery welds.

4. Navigation and Vessel Inspection Circular (NVIC) 7-68

Inspection personnel shall become thoroughly familiar with the contents of NVIC 7-68, "Notes on Inspection and Repair of Steel Hulls." This NVIC provides guidance in the inspection and repair of steel-hulled vessels for certification (See MSM II B1).

C. CONSTRUCTION OF VESSELS

1. General Standards

Vessels to which the inspection statutes and regulations apply shall be constructed in accordance with approved plans, specifications, and applicable regulations.

2. Bulkheads and Decks

NVIC 6-80, "Guide to Structural Fire Protection Aboard Merchant Vessels," contains information concerning approved insulation, bulkhead panels, and deck coverings used on most vessels. Plywood may continue to be used for nonstructural interior bulkheads in the superstructures of cargo or miscellaneous vessels of 4,000 and more gross tons (GT), built prior to 1 January 1962, provided the requirements of 46 CFR 92.05 and 92.07-90 are met. It is realized that there are other materials that minimize fire hazards as required by 46 CFR 92.05 and 92.07, and they are recommended. Plywood is prohibited for nonstructural interior bulkheads in the superstructures of passenger and tank vessels, and all cargo and miscellaneous vessels of 4,000 and more GT contracted for on or after 1 January 1962.

3. Living Spaces Aboard Tank Vessels

a. General Requirements. The requirements governing construction of the accommodation spaces (staterooms, hospital spaces, passageways) and public spaces such as messrooms and recreation rooms on tank vessels are prescribed in 46 CFR, Subchapter D. The use of "fire-resistive material" in the construction and insulation of crew accommodation spaces on tank vessels is required by 46 CFR 32.40-1(d) and 32.60-25. The term "fire-resistive material" means noncombustible material approved under 46 CFR 164.009 and listed as "noncombustible materials" in Equipment Lists, Commandant Instruction (COMDTINST) M16714.3. It is intended that all materials of construction, including panels and insulation and any materials used in the erection or for their support,within living spaces shall be approved "noncombustible materials.

b. The only combustible materials of construction permitted within the living spaces are decorative veneers and trim on the panels of staterooms and public spaces. No combustible materials are permitted in the passageways or in hidden spaces. There are also restrictions on the type of furniture or furnishings to be used.

4. Lap-Welded Seams In Tank Barges

a. Some shipyards fabricate tank barges with lap-welded strakes, since lap-welded construction in certain cases is cheaper and easier to complete than butt-welded construction (usually, small shipyards apply lap-welded construction). Neither the Coast Guard nor ABS has published rules specifically limiting or prohibiting the use of lap-welded joints, and some lapped joints may be practically unavoidable in any vessel construction; for example, tank barges usually have lapped joints at the turn of the bilge and at the deck edge. However, the use of lap-welded seams has the following disadvantages:

(1) A void is created in the lapped joint that can form a gas pocket if the fillet weld on the inside is not tight. Several such gas pockets could make the gas-freeing of a cargo tank difficult. In addition, these voids could provide a route for leakage of gas or liquid cargo from one tank to another.

(2) There is no way to test the tightness of the inside fillet weld, since the usual methods of testing a tank will indicate leaks only if the inside and outside welds of a lapped joint are not tight.

(3) An increased rate of corrosion is usually experienced in way of lapped joints.

(4) A tank with lapped joints is more difficult to clean than a smooth tank with butt-welded joints.

Conditions of Acceptance

b. Lap-welded joints may be accepted in way of cargo tanks on tank barges if the following requirements are met:

(1) Welded stopwaters are provided in each lapped seam in way of oiltight bulkheads;

(2) The overlap of the plates complies with ABS Rules, which specify that "Lapped joints are generally to have overlap of not less width than twice the thinner plate thickness plus one inch." The size of the overlap should not be excessive, to avoid the creation of large void spaces; and

(3) Joints are continuously welded on both sides. The use of lap-welded seams in tank barges should be discouraged, but not prohibited unless the inspector finds a failure to meet these requirements.

5. Single-Dogged Hatches and Scuttles

Hatches on inspected vessels are generally subject to the approval of the OCMI, according to their suitability for the intended locations on board and their use. There is no provision for type approval and they are not normally seen in detail on plans submitted for the OCMI's approval.

6. Fiberglass Gratings

a. General. Fiberglass gratings are not specifically addressed in the individual vessel regulations. However, fiberglass is combustible; therefore, its use must be limited based on the general requirements to reduce hazards from fire. Basically, fire-retardant fiberglass may be used anywhere except in accommodation areas, and in any other area where their failure could hinder escape or access by firefighters. Although all fiberglass must be fire-retardant, there are no Coast Guard approvals for fire-retardant fiberglass gratings or cable trays. However, the OCMI may authorize its use in particular installations, considering the fire retardance and the criteria in subparagraph 5.C.6.c below. The manufacturer should provide the Coast Guard inspector with appropriate test data; a report showing a flame spread rating less than 25 according to the American Society for Testing Materials (ASTM) Standard E-84 would constitute appropriate evidence. Fiberglass cable trays may be used in exterior locations and in machinery spaces, provided that they are not installed in concealed spaces.

b. Restrictions on Use. Fiberglass gratings may not be used:

(1) within the accommodation area;

(2) in areas where their failure could hinder escape or firefighter access. Vessels fitted with deck foam firefighting systems must have steel or equivalent access to the foam monitors (e.g., deck grating to foam monitors must be steel or equivalent.);

(3) The use of fiberglass for cargo tank hatch covers is prohibited on all foreign tank ships while trading in U.S. waters. Those vessels found not to be in conformity with this policy should be issued a deficiency notice to correct the situation within a reasonably brief time period.

Authorized Uses

c. Authorized Uses. Since the approval of fiberglass cable trays and gratings is so dependent on the specific location and application, it is not possible for the Commandant to grant general approvals. In the past, however, the use of fiberglass gratings aboard inspected vessels has been authorized in the following areas:

(1) Sea chest screenings;

(2) Small sundeck awnings and supports;

(3) Lifeboat bilge flooring;

(4) Electrical control flooring;

(5) Pipe guards on deck, in cargo holds, and in enginerooms;

(6) Fore and aft main deck catwalks;

(7) Main deck crossover catwalks;

(8) Removable guards over hawseholes, anchor hawsepipes, and scuppers;

(9) Personnel barriers, such as protection for electrical panels;

(10) Ladders, platforms, and catwalks located within double bottoms, bilges, peak tanks, fuel tanks, liquid bulk cargo tanks, and other spaces not normally entered when underway;

(11) Ship staging and work platforms (Occupational Safety and Health Administration (OSHA) requirements may also apply);

(12) Platforms and ladders located on radar, radio, or other electrical apparatus masts;

(13) Platforms or walkways on kingposts;

(14) Overlay on existing weather decks to provide slip resistant, self-draining walking surfaces;

(15) Overlay on steel decking around electrical equipment to provide for insulation and safety of personnel; and

(16) Elevated flooring in boatswain's lockers.

7. Hull Welding Standards for Aluminum Small Passenger Vessels (T-Boats)

The regulations contained in 46 CFR 177.300 incorporate, by reference, various non-Coast Guard standards with which a builder must comply to satisfactorily meet minimum structural design requirements. This is a broad requirement which is not otherwise defined, particularly with respect to construction details such as welding.

Recent examinations of aluminum T-boats built in the late 1980's and early 1990's revealed that shell plate fit-up and edge preparation was such that a proper root gap was not achieved so that a full penetration weld could not be made consistently in the construction of the vessels.

Essentially, the shell plate was square-butted together and ground by hand to produce a rough bevel. This procedure effectively left a shoulder in the joint which was not assimilated during the welding process, Further, there was no attempt made to back gouge the weld from the opposite side to remove the discontinuity. Hence, when a cap pass was applied to the back side, a lack of fusion remained, clearly apparent when the weld is x-rayed.

This type of shell welding process is not acceptable for any type of inspected vessel where the long term effects of fatigue could adversely effect the strength of these connections. This could result in failure while in service and/or be less resistant to impact from mechanical damage.

Henceforth, effective immediately, all OCMIs in whose zones aluminum T-boats are constructed, shall ensure that the joint design and welding of butt joints strictly adhere to the provisions contained in the American Bureau of Shipping (ABS) Rules for Building and Classing Aluminum Vessels (1975), Chapter 30, Section 30.7. or to the provisions of Lloyd's Rules and Regulations for Classification of Yachts and Small Craft, Part 2, Chapter 3, dependent on the standard used to meet the structural design requirement.

D. VESSEL REPAIRS, ALTERATIONS, AND "HOT WORK"

The problem of avoiding casualties on all vessels under repair is extremely complicated, due to the possible presence of explosive gases and sources of ignition created by the use of flame or spark producing tools. No repairs or alterations involving the safety of a tank vessel may be made until the requirements of 46 CFR 35.01-1 have been met. These regulations set forth the provisions under which a certified marine chemist will make a decision as to whether the work can be accomplished safely (see section 5.I below). A tank vessel may have "hot work" performed in or on the boundaries of a tank previously containing flammable liquids only after the tank has been cleaned and gas-freed by conventional methods, and when the surrounding tanks have been cleaned and gas-freed or inerted with carbon dioxide or water. 33 CFR 126.15(c) applies to vessels conducting hot work while moored at designated waterfront facilities.

E. INSPECTION AND REPAIR OF TANK BARGES

1. Introduction

Tank barges employed primarily in river or inland service are generally towed alongside or pushed ahead, as opposed to being towed astern. Barges in these services are subjected to rigors of locking and fleeting operations that are not normally experienced by seagoing barges or self-propelled vessels. As a result, some distinct structural problems have evolved.

2. Hull Damage Considerations

a. Introduction. While the following guidance was conceived generally to address the problems occurring on vessels in river service, the benefits of preventing pollution incidents through its application may be universally realized. Therefore, this guidance is applicable to all tank barges having areas of the cargo envelope (excluding the deck) that are not protected by a double hull.

b. Causes. Normal river and inland operations result in frequent structural deformations of a barge's hull. The rubbing of barges against one another and against lock walls causes the hull plating in some areas of the vessel (side plating against framing members, barge corners, ends, and knuckles) to wear thin, while the majority of plating remains in good condition. Such wearing diminishes the plate thickness in these areas and causes plate deformation at the edges of the internals. Continued deformation and metal working results in many weakened areas that are extremely prone to crack initiation and growth. Such degradation of strength in the cargo envelope (the hull) makes river and inland barges particularly prone to pollution incidents resulting from the minor damage of routine operations or low-energy collisions.

3. Inspection Standards

The extent of inspection, and the types of repairs necessary to ensure that a tank barge can operate safely, will naturally depend upon its age, route, and other considerations. However, the operation of tank barges upon routes with minimal exposure to severe weather or sea conditions cannot justify imposing less stringent inspection or repair standards if they increase the likelihood of a pollution incident. The provisions of NVIC 7-68 apply to all tank barges and shall always be applied. The following additional notes apply to the inspection of single-hulled tank barges:

a. Deficiencies. In determining whether a deficiency compromises a vessel's suitability for its intended service, the possibility of a pollution incident arising from the deficiency must be considered. A vessel whose condition is considered likely to cause a pollution incident is not suitable for carriage of oil in bulk.

b. General Evaluation of Hull Plating. Tank barges are, of course, subject to the general causes of deterioration noted in NVIC 7-68. However, because of the frequent rigors of locking and fleeting operations, particular attention must be given to end and sideshell plating that must withstand such continuous wear. Where such plating is stiffened by internal structural supports or bulkheads, the greatest loss in plate thickness can be expected. Often, plating between structural supports will show little loss in plate thickness, while plating supported by internals will be extremely thin. The acceptable degree of hull plating deterioration has traditionally been evaluated by considering the effect of the reduced plate thickness upon total hull strength. Specific limits for deterioration of various areas of the vessel have been suggested in NVIC 7-68. Localized wastage in excess of these limits has generally been accepted, provided adjacent material retains adequate strength and the localized deterioration does not result in a radical change in cross-section or a general weakening that could act as a notch.

c. Evaluating Excessive Deterioration. A further consideration must be whether reduced thickness of the local area would allow penetration of the product envelope from low-energy impacts or abrasion encountered during fleeting or locking operations. Here the general guide of 25-percent deterioration indicated in NVIC 7-68 applies. However, there are instances where renewal of hull plate should be required even though deterioration/wastage may be less than 25 percent. An example is heavily or deeply pitted plating areas on vessels which were constructed with less than 3/8" original hull plating. In this case, 25-percent deterioration would mean plating of less than 1/4" as the only barrier between cargo and water. When plating becomes this thin, an evaluation must be made in each case to determine the strength of the hull and its ability to withstand the rigors of routine, unrestricted operations.

4. Repair Standards

General Concerns

a. General Concerns. The need for renewal of plating is generally evaluated by considering its overall condition. However, in the case of tank barges that must withstand frequent fleeting and locking operations, where the hull plating is the only barrier between cargo and water, the condition of the plate in the way of internal structural supports should be the determining factor, even when the plating between internals shows negligible wastage. NVIC 7-68 provides guidance on gauging for evaluation of plate condition and cautions against gauging without sufficient cause. This does not preclude gauging during an inspection to adequately assess the condition of hull plating in the way of internal structural supports. The repeated rubbing of tank barges against lock walls and other barges can leave little evidence of loss of plate thickness in way of internals, and gauging may be necessary to reveal the true condition of such plating.

Plate Cracking

b. Plate Cracking. The rigors of unrestricted river operations generate problems other than thinning of plating. The repeated working of shell plating against lock walls and other barges causes crack initiation and growth in many areas. Frequent handling of tank barges by towboats results in areas that are repeatedly set in by low-energy impacts, resulting in the formation of cracks in plating. Generally, the presence of more than two repaired cracks in one local area should be cause for special attention: the formation of a subsequent crack in such areas is likely.

Repairs of Cracked Plating

c. Repairs of Cracked Plating. To avoid pollution incidents, cracked plating should be repaired through plate renewal or an insert. When cracks are repaired through welding, the repair procedures outlined in NVIC 7-68 should be followed; the need for proper edge preparation and full penetration welds is emphasized. When repairs involve the renewal of less than a full plate, an insert of less than 18" by l8" normally should not be accepted (see NVIC 7-68). Inspectors shall ensure that the edges of the insert lie in line with existing welds or that the corners of the insert have the proper radius.

Use of Rub Bars and Doublers

d. Use of Rub Bars and Doublers. Doubler plates are unacceptable for permanent repairs of tank barge hulls, as discussed in NVIC 7-68. Often, however, rub pads or rub bar doublers are installed in areas where excessive wear of the hull plating is detected or anticipated. When such a doubler is to be installed on an existing single-hulled barge, the hull plating to be covered should be carefully examined to ensure that excessive wastage has not already occurred. In some cases, older tank barges may have rub pads or rub bars that were installed without adequate evaluation of the hull plating. Removal of these may be necessary to ascertain the suitability of the original hull plating. Where half-round pipe is used as a rub bar, the hull plating beneath is often subject to accelerated corrosion. Gauging from inside the tanks or periodic removal of these bars may be necessary to ensure proper hull plating thickness. Where such rub bars extend across several tanks, the installation of water stops should be considered. Repairs to internals should generally follow the guidance in NVIC 7-68.

Stiffening of Internals

e. Stiffening of Internals. On tank barges in river service, the need for repairs to internal structural supports may be questioned because the stresses of heavy seas and weather conditions are not normally encountered and overall hull strength may seem less critical. However, when plating on single-hulled tank barges is not adequately supported, repeated low-energy impacts or excessive stresses from overloading can deform hull plating to the point of failure and result in pollution. Hull plating must always be provided with adequate stiffness to prevent underway panting, and must be able to distribute the force of low-energy impact loading uniformly along the internal structure of the vessel. If the internal structural supports are substantially deformed from original conditions or fail to have the designed amount of contact between support members and hull plating, consideration must be given to requiring renewal.

Restrictions on Use of "Clips"

f. Restrictions on Use of "Clips." The common practice of welding "clips" to join distorted members to the hull plating cannot be accepted on single-hulled tank barges for extensive repairs to internals. Isolated use of clips may be acceptable if the internals so repaired continue to provide substantially the designed amount of support to the hull plating.

F. STRUCTURAL FAILURES AND CASUALTIES

1. Normal Operating Conditions

Structural failures as defined below are to be distinguished from structural damage. For each defined failure standard, normal operating conditions are stressed to distinguish between those fractures and buckles occurring as a result of the natural working of a vessel's hull as opposed to those which occur as a result of some external force such as collision, allision, grounding, fire, explosion, earthquake, improper cargo handling or ballasting, etc. Fractures and buckles which result from external forces should not be construed as structural failures but reported as marine casualties if they meet the definitions contained in 46 CFR 4.03. Conversely, those, fractures or buckles which occur naturally should not be considered marine casualties per se. However, by definition, because all Class 1 structural failures compromise the vessel to safely operate within its design parameters, they are clearly reportable as marine casualties under 46 CFR 4.03. Class 2 and 3 structural failures, as defined, will normally fall outside the parameters of the marine casualty definition except in the rare occasion where the cost of a single repair might exceed the monetary value established in 46 CFR 4.03. In any case, the purpose of reporting structural failures is to determine if unwanted trends are developing in particular classes of vessels or vessels which may be operating in a particular environment in order to ensure that appropriate corrective actions are initiated.

2. Classifications and Definitions

Definitions

a. Standards for the definitions in paragraphs MSM II A5.E.2.b and A5.E.2.c:

Outer Shell

(1) Outer Shell: The side-shell and bottom plating of a vessel including the bow and stern rakes of barges.

Oil-Tight Envelope

(2) Oil-Tight Envelope: That portion of the outer shell in way of cargo oil tanks and the vessel's bunker/fuel, lube oil and slop tanks, exclusive of the clean ballast tanks.

Main Strength Members

(3) Main Strength Members: Those structural members which provide primary longitudinal strength to the hull and those transverse structural members which directly contribute to support longitudinal strength members.. Such members include the strength deck plating; side and bottom plating; tank top plating; the center vertical keel; underdeck, side and bottom longitudinal stiffeners; internal longitudinal bulkheads and stiffeners; deep web frames and girders; transverse bulkheads and girders, and associated bracketing connecting the aforementioned longitudinal and transverse structural members.

Buckle

(4) Buckle: Any deformation in the outer shell and/or strength deck plating and the adjacent internal main strength members to the extent that structural strength has been lost.

Action

(5) Action: The extent of response an operator must take, with concurrence by the OCMI, for a particular structural failure.

Class I Structural Failure

b. Class I Structural Failure: During normal operating conditions, either

(1) A visible, through thickness fracture of any length in the oil-tight envelope of the outer shell where threat of pollution is a factor or,

(2) A fracture or buckle which has weakened a main strength member to the extent that the safety of the vessel to operate within its design parameters- is compromised.

ACTION: Immediate corrective action must be initiated by the operator with approval of the cognizant OCMI. Temporary repairs may be permitted to allow the vessel to safely transit to a repair facility.

Class 2 Structural Failure

c. Class 2 Structural Failure: A fracture or buckle within a main strength member which does not compromise the safety of the vessel to operate within its design parameters and does not create a threat of pollution either by location or containment.

ACTION: Necessity for corrective action shall be evaluated and agreed upon between the vessel operator and OCMI when the failure is found. Temporary repairs until the next scheduled repair period may be authorized.

Class 3 Structural Failure

d. Class 3 Structural Failure: Any fracture or buckle which does not otherwise meet the definition of a Class 1 or 2 structural failure or a fracture which might normally be considered a Class 2 but is determined not to be detrimental to the strength or serviceability of the effected main hull structural member.

ACTION: Corrective action or notification to the OCMI is not required. Shall be noted for the record, monitored by the operator if deemed desirable and addressed,at the next regularly scheduled repair period.

3. Notification of Class 1 Structural Failures on U.S. Flag Vessels

The following actions shall be taken when a Class 1 structural failure occurs on any U.S. documented non-recreational vessel. Under no circumstance will a vessel be allowed to operate under the terms and Conditions of its Certificate of Inspection until permanent repairs are completed and they are approved by the OCMI. Temporary repairs with additional imposed conditions of operations may be authorized by the OCMI to permit the vessel to proceed to a discharge port and/or repair facility.

Operator's Responsibility

a. Operator's Responsibility. When a Class 1 structural failure is discovered, the vessel operator shall immediately report it to the cognizant OCMI of the zone where detected. It shall be the operator's responsibility to complete and submit Coast Guard form CG-2692, "Report of Marine Accident, Injury or Death in accordance with 46 CFR 4.05-10. The operator will submit details of the temporary and/or permanent repair procedures to the OCMI and the ABS (or appropriate class society). The repair plan shall include a past history of any similar failure, the results of any past analysis related to that type of failure and the results of past repair actions. Operators of vessels with either Coast Guard Critical Areas Inspection Plans (CAIPS) or ABS Enhanced Survey Programs are advised that submittal of these documents for OCMI review would satisfy this requirement. If the operator has no available history to provide, then a failure analysis will be required, original to the OCMI, copy to Commandant (G-MOC). Design induced failures on vessels that have had plan approval by the Marine Safety Center (MSC) shall be reported to the MSC. For clarification's Class 1 structural failure must always be reported on the CG-2692 regardless of when or where found.

OCMI Responsibility

b. OCMI Responsibility. The OCMI shall advise G-MOC, in conjunction with district (m), immediately after receiving notice of a Class-1 structural failure by most expeditious means possible. G-MOC will in turn advise G-MO-1 of the event. After regular working hours and on weekends, notification should be made through the Headquarters Command Center. if cognizant G-MOC personnel are unavailable, notification should be made to a G-MO-1 traveling inspector. The OCMI shall evaluate the operator's repair proposal. OCMIs are strongly urged to contact G-MO-1 for consultation regarding acceptable repair procedures. G-MO-1 files contain significant information on previously approved repairs which would be beneficial to ensuring consistency across Marine Inspection zones.

4. Tank Vessel Restrictions

Pending completion of permanent repairs to the oil-tight envelopes of tankships, operational restrictions may be placed upon these vessels. Restrictions may include prohibition of carrying cargo in the affected tank(s) in order to allow a vessel to remain in service while in that condition, the operator must submit calculations to the OCMI which demonstrate that the other intact tanks can be loaded without placing additional stress on the hull structure and that the vessel can safely operate with the affected tank either ballasted or empty.

5. Vehicles with Recurring Structural Failures

A vessel which suffers repeated Class 1 structural failures or a continuous high numbers of Class 2 structural failures will be placed in a "Special Attention Vessels" category. vessels not otherwise enrolled in the Critical Areas Inspection Plan (CAIP) program outlined in NVIC 15-91, NVIC 15-91, Change 1 and A5.J. of this volume may be required to do so. If the condition of the hull structure does not significantly improve, additional operating restrictions regarding route and service may be imposed. In severe cases, the vessel's COI may be revoked and the vessel removed from service. G-MOC will maintain a list of these vessels and they will be regularly attended by a traveling inspector. All structural repairs for these vessels will be approved by G-MOC.

6. Vessels Enrolled in the Alternative Compliance Program (ACP)

As of February 1995, a pilot program was established to delegate the ABS authority to perform surveys of US flag vessels on behalf of the Coast Guard pursuant to issuance of a COI. Guidance for this program is contained in NVIC 2-95 and COMDTINSTs 16711.17 and 16711.18. Unless otherwise provided for in MSM II A5.J. with respect to the CAIP Program, approval of Class 1 structural repairs lies solely with the ABS unless it is determined through oversight monitoring procedures that the repairs, as effected, are inadequate. Participation of a vessel in the ACP does not relieve an operator of the responsibility of reporting a Class I structural failure to the cognizant OCMI.

7. Documentation of Class 1 Structural Failures

It is rare that two or more types of Class I structural failures occur during the same event or examination interval. Should this happen, each type shall be reported by separate CG-2692. If multiple failures of the same type occur, they may be reported on a single CG-2692. The following information should be provided as a minimum with the CG2692 for each Class I structural failure:

a. A one or two sentence description on the CG-2692 noting the location and size of the fracture, affected structural components, how the failure was found and method of repair. it is acceptable to attached a shipyard repair specification or class surveyor's report if they contain this type of information.

b. Photos and/or sketches of the structural failure with identifying marks noting the strake; plate number; frame number; side or bottom longitudinal number; location, i.e., port, starboard or centerline; ship's name and any other useful reference points - Photographs should clearly indicate the originating point of the fracture if it can be visually determined.

c. A description of the structural detail if determined that it caused or contributed to the cause of the failure, including a description of any similar detail failures which previously occurred in that vessel or sister vessels.

d. Identification of the vessel's trade and principal operating route; time and weather conditions when the failure occurred; and the stability condition of the vessel, including hull stresses if available. When the specific time of the failure is not known, a general statement about weather conditions and stability patterns is sufficient.

e. Steel samples shall be obtained for analysis and/or nondestructive testing for Class 1 structural failures, not previously analyzed, if the cause of the failure is not due to some obvious or known discontinuity. The vessel operator shall arrange for the failure analysis if it will assist in determining the cause of the failure. A copy of the report shall be provided to the cognizant OCMI investigating the failure.

f. When accurate information is not available, then the best available data is to be reported concerning the date when found, approximate time/date when the failure may have occurred, possible contributing environmental conditions, stability condition of the vessel and any other information deemed to be possibly pertinent. All such information should be noted as approximate.

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8. Notification of Class 1 Structural Failures on Foreign Flag Vessels

In addition to the procedures outlined in paragraph E.3.a, the following items shall be adhered to when a Class 1 structural failure occurs to a foreign vessel operating in U.S. waters:

a. Repair proposals shall be provided by either the vessel operator or authorized agent to the vessel's class society representative and the cognizant OCMI. Repairs are not authorized until approved by class.

b. If class authorizes temporary repairs, the OCMI will notify the vessel's master and agent that the vessel will not be allowed to return to a U.S. port until permanent repairs are accomplished, approved by class and all outstanding conditions of class related to the incident removed.

c. Under port state control authority vested within the Captain of the Port, the OCMI may reject class approval of either permanent or temporary if it is determined that they will not restore the vessel to a condition to allow it to operate within its design parameters.

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9. Notification of Class 2 and Class 3 Structural Failures

Class 2 and Class 3 structural failures as defined in MSM II A5.E.2.c. and d. do not meet the definition of a "marine casualty" in 46 CFR 4.03. Therefore, neither failure is required to be reported on Form CG2692. However, when Class 2 and Class 3 structural failures are detected, the following actions will be taken.

Class 2 Structural Failures

a. Class 2 Structural Failures. Class 2 structural failures have the potential to become serious through fracture propagation, particularly in a longitudinal strength member that has failed in tension. Please refer to NVIC 15-91, Change 1, which contains important information regarding critical crack length and brittle failure. When a Class 2 failure is found, it must be reported the cognizant OCMI if not found during a scheduled Coast Guard examination. In either case the operator shall submit a repair proposal containing either a temporary or permanent fix. In no case will a temporary repair proposal be accepted during a hull examination for credit unless it involves the necessity of the vessel proceeding to another port for permanent repair. Based on the information presented in the proposal, the OCMI may allow a temporary repair or require immediate permanent repair.

Class 3 Structural Failures

b. Class 3 Structural Failures. Class 3 failures are not required to be reported to the OCMI if found at times other than a credit hull exam. The operator shall address all Class 3 failures at each credit hull examination. Based on location, size and type of structural member involved, the OCMI may elect to defer repairs and permit the failure to be monitored at some mutually agreeable interval with operator, particularly if the repair will set up a hard spot or stress riser making the detail more susceptible to failure.

10. Documentation of Class 2 and 3 Structural Failures

Operators of All vessels which have either a CAIP manual and/or an ABS Enhanced Survey record shall enter the types and dispositions of the failures as appropriate and in accordance with the guidelines of MSM II A5.J. or the ABS Rules pertaining to enhanced surveys. Entries of such failures on vessels not required to maintain these records will be made into the MSIS system through an MISN. The entry should be detailed to sufficiently describe the number and types of failures and where the hard copy of the repair approval is located. OCMIs are encouraged to contact the Traveling Inspectors regarding repair of Class 2 failures as a means to help insure consistency throughout marine inspection zones.

11. Relationship Between the OCMI and ABS Regarding Repair Approval

Historically, many OCMIs required operators to submit and obtain approved repair plans from ABS (or the cognizant class society) prior to presenting it to the OCMI. While this has worked successfully in most cases, there have been occasions where OCMIs have certain concerns about items not believed to be adequately addressed in the ABS approval. Typically, the OCMI waits until an approval of repairs has been received from the ABS or cognizant class society. In order to help ensure a harmonious regulatory position, all OCMIs should review any repair proposal concurrently with their local ABS counterparts to come to a decision on the acceptability of the repair proposal. This partnership facilitates the process by forging a unified regulatory review that assures that the acceptance by one party will not be disputed by the other causing untimely delays through the appeal procedures.

12. Forwarding of Class I Structural Failure Reports

Upon completion of the investigation of a Class 1 structural failure, the OCMI shall forward the CG-2692 and all supporting attachments to G-MOA for inclusion into the casualty database, via the district (m) office.

G. REPORTS OF EQUIPMENT FAILURE ONBOARD INSPECTED VESSELS

Whenever approved systems or items of approved equipment (systems or items approved under an approval number) fail, or non-approved systems fail and a dangerous condition results, Form CG-2752A, Report of Equipment Failure on Inspected Vessel, shall be submitted. This report is used to indicate failures only, not to report replacements due to normal wear or deterioration. All steering gear failures shall be reported in as much detail as possible.

H. NFPA CERTIFIED MARINE CHEMISTS

1. Requirements for Inspections Prior to "Hot Work"

The following regulations require an inspection to be made before alterations, repairs, or operations involving hot work are undertaken within cargo tanks used to carry flammable and combustible liquids or chemicals in bulk or on their boundaries, fuel tanks and their boundaries, piping, and equipment connected to cargo or fuel tanks:

	TYPE	CFR CITE
a.	Tank Vessels	46 CFR 35.01
b.	Passenger Vessels	46 CFR 71.60
c.	Cargo and Miscellaneous Vessels	46 CFR 91.50
d.	Public Nautical School Ships	46 CFR 167.30
e.	Oceanographic Research Vessels	46 CFR 189.50
f.	Mobile Offshore Drilling Units (MODUs)	46 CFR 109.573

2. Requirement for a Marine Chemist

In the U.S. or its territories and possessions, inspections preceding hot work must be made by a marine chemist certified by the National Fire Protection Association (NFPA). A list of certified chemists is contained in the annual NFPA Marine Chemists Directory. When no marine chemist is reasonably available, the regulations provide for the OCMI to select and authorize another person to perform the required inspections (see paragraph A5.I.7 below). When the vessel is not in the U.S., and no marine chemist or other person authorized by the OCMI is reasonably available, the regulations require the inspection to be made by the senior vessel officer present and properly noted in the vessel's logbook.

SAFETY NOTE: It is unsafe to conduct an ISE while a vessel is loading/discharging, even when the space is certified by a Marine Chemist. The ISE shall not be done due to the potential for changing conditions which would create a hazardous environment.

3. Functions of the Marine Chemist

The Marine Chemist will:

a. Conduct a physical inspection and test the condition of tanks and spaces;

b. Determine what previous cargoes were carried;

c. Check calibration of instruments before and after each day's use; and

d. Test spaces for oxygen (19.5 percent minimum), combustible gases (must be below 10 percent lower explosive limit (LEL), and toxic substances (minimum by threshold limit values (TLV's)). TLV's are published in the latest edition of the booklet "Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment." This is published by the American Conference of Governmental Industrial Hygienists.

SAFETY NOTE: For additional information concerning toxic vapor hazards in confined spaces, see MSM I, Chapter 10.

4. Marine Chemist Certification

The marine chemist must complete and sign a marine chemist certificate indicating the compartment is "safe for workers" and "safe for hot work" before hot work begins. A signature of receipt is required from the owner, employer, or shipyard representative responsible for posting the certificate and maintaining the conditions required by it. The certificate also states conditions under which the marine chemist should be consulted or recalled. Unsigned marine chemist certificates are invalid. The marine chemist notes the results of his or her inspection on the certificate, as well as any conditions that must be maintained by the "competent person," including:

a. Frequency and types of additional tests;

b. Further inspections;

c. Qualifications; and

d. Other pertinent instructions.

5. Standards for Marine Chemist Activities

The publication "Control of Gas Hazards on Vessels," NFPA 306 (latest edition), is the guide for the inspections required and certificates issued before alterations, repairs, or operations as described above are performed. Inspection personnel should become familiar with the provisions of NFPA 306 and the procedures that the marine chemist must follow to issue a marine chemist certificate, as well as additional requirements for bulk chemical cargo tanks and flammable cryogenic liquid (FCL) carriers.

6. "Competent Person

a. Introduction. OCMI's should become familiar with the OSHA requirements in 29 CFR 1915.12 concerning flammable and oxygen-deficient atmospheres and tests made by "competent persons." This designation is a creation of the OSHA regulations (29 CFR 1915), by which certain functions, relating to ship repair, shipbuilding, and shipbreaking are performed. A "competent person" is generally defined in the OSHA regulations as a person capable of recognizing and evaluating employee exposure to hazardous substances and other unsafe conditions. The "competent person" is also capable of specifying necessary protection and precautions to be taken to ensure the safety of employees required by the particular regulation to which the condition applies.

b. Functions. The "competent person" is responsible to his or her employer, and one or more such persons are required to be designated by employers when working conditions in a shipyard involve flammable atmospheres. If a certified NFPA marine chemist performs the duties of the "competent person" in addition to the duties of the marine chemist, that fact shall be recorded. The "competent person's" duties generally involve:

(1) Determining oxygen content in tanks or spaces prior to workers' entry;

(2) Determining concentrations of flammable vapors or gases in cargo tanks and other spaces having contained flammable or combustible liquids or gases prior to entry by workers;

(3) Maintaining safe conditions relating to cleaning and cold work in tanks and spaces having contained combustible or flammable liquids or gases;

(4) Determining concentrations of flammable vapors or gases in areas not requiring a marine chemist certificate prior to hot work;

(5) Maintaining, receipting for, and posting marine chemist certificates and appropriate warning signs;

(6) Maintaining and testing conditions in tanks and spaces after certification is issued by a marine chemist; and

NOTE: Qualifications for a "competent person" include knowledge and application of protective equipment and devices to minimize hazards from coatings and residues, fire watches, fire extinguishers, charged hoses, fresh air breathing apparatus, air purifying respirators, etc.

(7) Maintaining a log of inspections, tests, operations performed, and any instructions from the marine chemist.

SAFETY NOTE: In spaces where toxic atmospheres or residues may be present, only a marine chemist, industrial hygienist, or other person similarly qualified to recognize and test for toxic substances shall be authorized to conduct the required pre-entry tests and inspections.]

Interaction with the Marine Chemist

c. The "competent person" accompanies the marine chemist through the vessel while the latter conducts the tests and inspections necessary to certify tanks as "safe." The "competent person" normally conducts a tour of all operations at least once every 24 hours and usually more often, depending on the type of work in progress. The marine chemist is not required to conduct follow-up inspections and tests unless recalled or unless conditions affecting issuance of certificates change (e.g., opening additional tanks, transferring oil, changes in atmospheric conditions of tanks).

Interaction with Coast Guard

d. In summary, the "competent person" is charged with carrying out the responsibilities of the employer in meeting the provisions of the marine chemist certificate and additional requirements of the OSHA regulations. The OCMI's role in this process should be:

(1) Awareness of the OSHA and Coast Guard regulations relating to shipyard operations;

(2) Awareness of the employer's responsibility to follow OSHA and Coast Guard requirements;

(3) Identification of those instances where existing regulatory requirements are not being followed, either by the "competent person" or the marine chemist;

(4) Reporting violations of regulations and unsafe practices to OSHA Regional Directors (concerning "competent persons") or to Commandant (MSC) (concerning marine chemists); and

(5) Dialogue with local marine chemists, OSHA officials, and shipyard employers to gain more insight into how "competent persons" and marine chemists operate, and to resolve problems of mutual concern.

7. Substitutes for Marine Chemists

a. Introduction. Under the regulations, the OCMI may be called upon to authorize another person to perform required inspections when it is claimed that the services of marine chemists are not reasonably available. The OCMI should consider each case on its own merits, considering the usual availability of marine chemists within reasonable distances, the impact on the vessel of delays in securing marine chemists, the nature of the cargo that the vessel previously carried, etc.

b. Restrictions. If it is necessary to authorize another person to perform a marine chemist's functions, the OCMI should give greatest consideration to those persons having long practical experience in the repair of vessels, rather than those versed in theory alone. It is stressed that an authorized substitute for a marine chemist is limited by the regulations to act only in the case of an individual vessel. Blanket authorizations to act in lieu of a marine chemist are prohibited.

c. Authorization Procedures. Authorization for persons to act in lieu of a marine chemist shall be made in writing. The names of persons making such recommendations, the person(s) recommended and their credentials, the name of the vessel being examined, the shipyard or repair point, and the date of recommendation shall be indicated. Copies of such authorizations shall be kept in a separate file marked "Marine Chemists - Authorized Substitutes For." From time to time, the OCMI may be asked to report on such authorizations to determine which areas require additional marine chemists.

8. Certification Standards

The NFPA certifies each person found to be a competent marine chemist to carry out the requirements in NFPA-306. An NFPA appointed, 5-member qualification board examines each marine chemist application to determine whether all requirements set forth in Appendix A of the current Marine Chemists Directory are fulfilled. Each marine chemist must re-qualify every 5 years, by completing additional training and educational requirements to ensure that he or she remains abreast of changing technology. The Coast Guard and OSHA provide nonvoting liaison officers to the qualification board who address their agencies' policies and problem areas. The Coast Guard liaison officer relays to the board comments from field units regarding individual marine chemist performances.

9. Types of Certificates

The NFPA issues only one type of certificate. This unlimited certificate certifies that the holder is competent to discharge all duties of a marine chemist in accordance with NFPA 306, on vessels of all types and sizes except FCL carriers. A special FCL carrier endorsement on the marine chemist certificate (license) is necessary before a marine chemist is authorized to issue marine chemist (gas-free) certificates for such vessels.

I. REPAIRS AND ALTERATIONS TO MARINE ENGINEERING EQUIPMENT

1. Introduction

The requirements in 46 CFR 59 apply to the repairs of all boilers, appurtenances, and pressure vessels subject to inspection by the Coast Guard. No repairs, replacements, or alterations shall be made without prior approval by the OCMI except in an emergency. The submittal of plans and specifications for approval may be required as specified in 46 CFR 59.01-5.

2. Tailshaft Repairs

The Coast Guard will accept welded repairs to tailshafts used on ABS classed vessels when they meet ABS requirements. When possible, repairs and tests to such shafts shall be witnessed by a Coast Guard inspector. The inspector shall verify that the work was performed by a welder qualified or certified by the Coast Guard, the U.S. Navy, or ABS, and that the welding repair is satisfactory. The ABS Guide for Repair, Welding, Cladding and Straightening of Tail Shafts details the procedures for repairing cracked steel shafts by welding. This guide also contains the requirements that must be passed prior to qualification to repair cracked or corroded shafting by welding. In the case of unclassed vessels, these recommended procedures should be used by the inspector as a guide in determining whether a satisfactory repair has been made.

J. CONVERSION OF LANDING SHIPS, TANK (LST'S)

NVIC 7-56, "Manned LST's; structural reinforcement and drydocking hull inspection requirements," contains instructions for the structural reinforcement of LST's being converted for manned commercial operation in ocean, coastwise, or Great Lakes service, and for the inspection of these vessels after conversion. NVIC 11-63, "LST's as Unmanned Barges; structural reinforcement and drydocking hull inspection requirements," contains the requirements for LST's converted for use as unmanned barges (See Chapter B5 of MSM II).

K. CRITICAL AREAS INSPECTION PLANS (CAIPS)

1. Use of CAIPs

NVICs 15-91 and 15-91, Change 1 established guidance concerning the implementation and use of CAIPS. CAIPs may be applied to any vessel or class of vessel based on evidence of repetitive and significant structural failures. The purpose of the CAIP is identify, track and document the history of a vessel's structure, including the means and methods employed to mitigate structural failures through modification of substandard design and construction details. It is meant to be a living document. As a vessel ages, it can reasonably be expected that new and/or more frequent failures of the hull girder will occur due to fatigue caused by a variety of factors. These include but are not limited to repetitive cyclical loading in a seaway, stresses imposed by environmental factors, operational conditions such as route, speed and cargo operations and type of service. In this manner, causes of structural failures are addressed and permanently corrected. This eliminates the potential for performing in effect a temporary repair of a fracture or defective which immediately addresses the symptom, but does not hold up in service.

2. Use of CAIPs by Inspectors

Periodic updating of the CAIP provides that the latest and best information about the hull structure is available to inspectors attending the vessel. All inspectors assigned to hull examinations of CAIP vessels shall review the manual prior to commencing the inspection. This is particularly important for new inspectors with limited hull/structural experience as the information directs attention to areas highly susceptible for failure, provides detailed information on previously approved repair procedures which aid in evaluating a current repair proposal and ensures a consistent regulatory approach. Inspectors are cautioned that although the CAIP is an excellent "road map" for detecting fractures, the remainder of the vessel must be carefully examined as unexpected fractures, potentially indicative of new trends, could have occurred since the last examination interval.

3. Establishing CAIP Requirements

As outlined in NVIC 15-91, the following implementation procedures apply:

a. G-MOC will be the implementing authority for CAIPs on vessels operating in multiple OCMI zones. This will be based on review of Class 1 structural failure casualty data, MSIS sorts of MISNs on Class 2 structural failure entries and Traveling Inspectors reports.

b. The cognizant OCMI is authorized to establish CAlPs for vessels that operate solely within that zone. The OCMI shall notify the district and G-MOC of the CAIP initiation.

c. G-MOC will maintain a list of all vessels required to have CAIPS. This will be available in an MSIS VFSC product. As of June 1996, all tankers engaged in the Trans Alaskan Pipeline Service (TAPS) trade, including all vessels engaged in the export of oil from Valdez, Alaska to a foreign destination, are required to maintain CAIPS. Special details concerning these CAIPs are contained in Section 10.D.10. of this volume.

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4. Operator Responsibilities

When a vessel or class of vessels are designated by G-MOC for the CAIP Program, the vessel operators shall:

a. Develop a CAIP in accordance with the performance elements of Enclosure (2) to NVIC 15-91. Format of the CAIP is left to the operator's discretion as long as all the performance criteria is included in the document.

b. Submit the CAIP to the vessel's classification society for review and approval.

c. Upon classification society approval, forward a copy of the approval letter to G-MOC. Submittal of the CAIP itself is not required.

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5. CAIP Surveys All CAIP surveys are the responsibility of the vessel operator. Coast Guard inspectors are not required to be present during the surveys but OCMIs are strongly urged to assign inspectors because of the tremendous training opportunities afforded by these inspections. Vessel operators often employ highly experienced structural experts to examine and evaluate the vessel's internal structure. These individuals are generally also responsible for drafting repair proposals. Inexperienced inspectors can gain important experience pertaining to structural assessment through association with steel surveyors. The following guidelines shall be followed:

a. Notice of a CAIP survey should be given at least 15 days in advance to the cognizant OCMI.

b. If Coast Guard inspectors will attend, the operator should present the extent and schedule of the exam to the cognizant OCMI. OCMIs are encouraged to contact the Traveling Inspectors (G-MO-1) to discuss upcoming surveys. The Travelers have accumulated extensive records of many past CAIPs that would be helpful to the marine inspector.

c. The CAIP must be conducted by an individual who is qualified to conduct structural examinations. This individual may be a class surveyor, a surveyor who has been certified by a classification society, or an experienced surveyor who can provide documentation of his/her qualifications to the OCMI. Port engineers and/or ship's officers may be employed if the operator attests in writing to their qualifications. Operators are advised that CAIPs conducted by unqualified individuals will not be accepted.

d. Cleanliness of the internal structure is paramount to the quality of the CAIP survey. Cleanliness is a subjective term. However, as a minimum, critical and active repair areas should be:

(1) Sufficiently free of standing water, particularly around bottom shell master erection butts and weld wraps of mushroom or rat-hole cutouts of bottom shell longitudinals.

(2) Sufficiently free of sludge and mud.

(3) Sufficiently free of wax build up and loose scale.

(4) Cleaned to prevent soft coatings, if applied, so as to prevent or hinder fracture detection.

If the CAIP surveyor has any doubt about the cleanliness of the internal structure, further butterworthing, water-washing and/or stripping shall be conducted.

e. Surveys may be completed by any of the following methods-

(1) Rafting

(2) Staging

(3) Other techniques that apply latest and best technology, such as high resolution cameras suspended in tanks, which result in satisfactory close-up examination of the vessel structure and is acceptable to the OCMI.

Ideally, any of the physical methods employed should permit the surveyor or inspector to be no more than ten (10) feet from any structural component within the critical area defined by the CAIP.

f. Upon completion of the CAIP survey, the operator shall prepare survey report for entry into the CAIP manual. one copy shall be entered into the manual aboard the vessel. Another shall be forwarded to the cognizant OCMI for review. The operator shall provide an executive summary of the report to G-MOC. This summary is intended to be brief. It may contain only types and numbers of the various classes of structural failures noted and if these failures were in existing or new active repair areas. It is expected that these documents be prepared and forwarded within 60 days of the CAIP survey.

6. OCMI Responsibilities and Guidance

The cognizant OCMI shall ensure that the following items are adhered to:

a. OCMIs shall instruct their inspectors to review the CAIP at each drydock exam and inspection for certification to verify that the plan is updated and the required surveys have been performed.

b. When resources permit, inspectors should participate in CAIP surveys. It can not be stressed enough about what an extremely valuable training opportunity a CAIP provides to first tour inspectors. Attending inspectors should monitor the survey and assess its overall quality and completeness.

c. When OCMIs are advised of fractures, they shall require and monitor repairs as required by MSM II A5.E.2.

d. OCMIs should conduct a thorough review of CAIP reports to determine if the periodic information from NVIC 15-91 is provided. The following areas should be of particular interest:

(1) Scope of the survey

(2) Qualifications of the surveyor

(3) Fractures reported as required.

(4) Repair proposals submitted by the operator are acceptable within the established guidelines. Repair procedures specifically to TAPS tankers can be found in MSM II B4.D.10.

e. CAIPs provide a historical record of the vessel's structural failure and repair history. This history should be employed to evaluate current repair proposals. if certain construction details or prior repairs continue to fail, repairs in kind should not be authorized. OCMIs shall notify operators of their responsibility to improve the deficient detail(s) and work in conjunction with the operator and vessel's class society to mitigate reoccurrence. Conversely, OCMIs and attending surveyors should recognize the effectiveness of prior repairs and design modifications and accept current repairs done in accordance with these procedures. This supports consistency across OCMI zones.

f. When Class 1 fractures occur, OCMIs shall require a failure analysis or non-destructive testing of steel samples in accordance with A5.E.7.e. of this volume. The CAIP process was developed to analyze structural failures and prevent or mitigate their recurrence. Such analysis is vital to this effort.

g. A history of recurring structural failures combined with an operator's reluctance to develop a permanent solution to their cause is sufficient grounds for the OCMI to recommend to Commandant (G-MOC), via the cognizant district (m), that a vessel be restricted from a particular trade, or, removed entirely from service. This is obviously a complex process that will require several levels of review. However, nothing is intended to limit the OCMI's authority to remove a vessel's Certificate of Inspection if it is determined that the vessel cannot safely operate within its design parameters.

h. After review of the CAIP survey report, the OCMI shall ensure that the proper CAIP survey information is entered into MSIS.

i. Vessels in the ACP. Several vessels required to maintain CAIPs have been accepted into the pilot Alternative Compliance Program (ACP). These vessels are inspected by ABS on behalf of the Coast Guard and are subject to oversight only. All oceangoing tankships classed by the ABS are required to follow Enhanced Survey guidelines in addition to normal survey requirements. The Enhanced Survey requirements closely parallel CAIP standards and are deemed equivalent as permitted by NVIC 15-91, Change 1, for the normal twice in five-year drydock interval. However, the Enhanced Survey guidelines do not specify any annual survey requirements. Thus, strictly adopting the ABS guidelines for Enhanced Survey causes the operator to not comply with the Coast Guard standards if the vessel is subject to an annual CAIP requirement. Consequently, when oversighting these vessels, the OCMI must determine that the vessel has completed an annual CAIP to NVIC 15-91, or, that the Enhanced Survey guidelines have been formally extended by ABS to the annual interval and that the required surveys have been performed. Failure to conduct either examination within the prescribed interval will cause the vessel to be removed from service until done and possible civil penalty procedures initiated against the operator.

CHAPTER 6: MISCELLANEOUS VESSEL INSPECTION ACTIVITIES

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CHAPTER 6: MISCELLANEOUS VESSEL INSPECTION ACTIVITIES

A. INTRODUCTION

This chapter discusses vessel inspections, other than drydockings and reinspections, that are related to, but not necessarily occurring at the same time as, an inspection for certification.

B. PERMISSION TO PROCEED FOR REPAIRS ONLY

1. Authority

Under 46 U.S.C. 3313, repairs may be deferred (when it can be done safely) until a vessel reaches a port where repairs may more conveniently be done. The regulations applicable to issuance of permits to proceed are:

VESSEL TYPE	CITE
Procedures Applicable to the Public	46 CFR 2.01-15
Tank Vessels	46 CFR 31.10-35
Passenger Vessels	46 CFR 71.05
Cargo and Miscellaneous Vessels	46 CFR 91.05
Public Nautical School Ships	46 CFR 167.30-5
Small Passenger Vessels	46 CFR 176.202 (Sub T) 46 CFR 115.202 (Sub K)
Oceanographic Research Vessels	46 CFR 189.05

2. Permit to Proceed to Another Port for Repairs, Form CG-948

Introduction

a. Upon request of the owner or operator and under certain conditions, the officer in charge, marine inspection (OCMI) may issue Form CG-948 to a vessel. This permit is a substitute for the Certificate of Inspection (COI); it shall be issued only when the OCMI judges that the vessel may proceed safely. When Form CG-948 is issued, the OCMI shall withdraw the COI and all amendments thereto, and forward them to the OCMI of the zone to which the vessel will proceed. Form CG-948 shall not be issued to a vessel that is eligible to retain its COI, nor to which an amendment to the COI would suffice.

Restrictions

b. A Permit to Proceed allows a vessel to be sailed from one port to intermediate ports along a route to its port of destination. However, the vessel may not voyage to several ports and return to the original port, nor may it voyage from a port in the continental United States to a port outside the continental U.S. and return. If the vessel's COI has expired or is about to expire, the OCMI may issue a Permit to Proceed to the port of final discharge, provided an inspection for certification has been conducted to the point where the OCMI considers it safe for the vessel to proceed and load or discharge cargo. The inspection may be continued at other ports and may be concluded at the port of destination. In such case, appropriate transfer of inspection records among OCMI's will be conducted.

Conditions of Operation

c. Every Permit to Proceed should be worded to expire when the port of destination is reached. Additional information regarding the purpose for making the voyage, the nature and extent of necessary repairs, special conditions to be observed, modifications in crew or equipment requirements, and whether or not the vessel may carry passengers or cargo, shall be set forth clearly on the permit. A Permit to Proceed may be renewed or extended by the OCMI having jurisdiction over the vessel.

3. Pre-Issue Inspection

Issuance of Form CG-948 is contingent upon Coast Guard inspection to determine that the proposed voyage can be conducted safely. The scope and extent of the inspection shall vary according to the circumstances, and shall be determined ultimately by the OCMI.

4. T-Boats Proceeding for Repairs

When not carrying passengers, vessels inspected under 46 CFR, Subchapter T may proceed to another port for repairs without obtaining this form. This is permitted because a small passenger vessel need not operate under the terms of its COI when passengers are not carried.

C. SANITARY INSPECTIONS

1. Authority

The statutory authority for sanitary examinations on vessels is found in 46 U.S.C. 33O8. The regulations establishing requirements for sanitary inspections are:

VESSEL TYPE	CITE
Tank Vessels	46 CFR 31.10-45 and 35.01-5
Passenger Vessels	46 CFR 71.45
Cargo and Miscellaneous Vessels	46 CFR 91.35
Nautical School Ships	46 CFR 168.15-60
Small Passenger Vessels	46 CFR 176.818 (Sub T)
	46 CFR 115.818 (Sub K)
Oceanographic Research Vessels	46 CFR 189.33

2. Inspection Procedures

Scope of Inspection

a. Coast Guard sanitary inspections are concerned with design, construction, and arrangement of tanks, crews' quarters, galleys, and similar spaces. They begin with plan approval prior to construction, alterations, or conversions. Aspects of sanitary concern include accommodation spaces, ventilation, plumbing, lighting, heating, control and location of overboard discharges, venting of fresh water tanks, installation of hot and cold water in hospital spaces, provisions against fresh water piping running through oil tanks (because of possible contamination), installation of proper drains in waste disposal systems and low points in piping systems, and the installation of insect screens and similar items where required.

Sanitary Inspections of Crew's Accommodations

b. Accommodations, including washrooms, messrooms, galleys, and storerooms, shall be examined for sanitary conditions. The marine inspector shall be satisfied that quarters are of the dimensions required, that they are properly ventilated and in a clean and sanitary condition, that they are equipped with the proper plumbing and mechanical appliances required, and that such appliances are in good working order.

Frequency of Inspections

c. Sanitation on inspected vessels is generally the responsibility of the master and the chief engineer. Coast Guard inspection personnel should restrict the number of sanitary inspections to the minimum compatible with statutory and regulatory requirements. A sanitary inspection shall be held during each inspection for certification, reinspection, drydocking, and such other times as provided for by statutes and regulations. Sanitary inspections of T-boats shall be held as the OCMI deems necessary; normally, they shall coincide with inspections for certification and reinspections. Inspectors shall be alert to unsanitary conditions at all inspections.

3. Unsanitary Conditions

Documentation

a. Documentation. If a suspected unsanitary condition is discovered, the inspector should take appropriate action to document the condition. The assistance of the Food and Drug Administration (FDA) and/or the Public Health Service (PHS), Centers for Disease Control (CDC), should be requested. These agencies may be contacted at the following addresses:

U.S. Public Health Service
Office of the Chief
P.O. Box DO, CPS, CDC
1015 North American Way, Rm 107
Miami, Florida 33132-2017
Ph: (305) 536-4307

Quarantine Station
U.S. Public Health Service
P. O. Box 90834
Los Angeles, California 90009
Ph: (213) 215-2365

Centers for Disease Control
Center for Prevention Services
Division of Quarantine
Atlanta, Georgia 30333
Ph: (404) 329-2574

U.S. Food and Drug Administration
50 U.N. Plaza
Federal Office Building
San Francisco, California 94102
Ph: (415) 556-0439

NOTE: The CDC has published an Operations Manual which describes their Vessel Sanitation Program. Coast Guard units may request a copy of the manual by contacting the CDC at the Miami or Atlanta addresses listed above.

The agencies at above are able to provide a detailed sanitation analysis, such as detecting the presence of bacteria in food or on food processing equipment. The results of the inspection should include detailed, verified, technical information upon which the Captain of the Port (COTP) can initiate enforcement action.

Enforcement

b. If the unsatisfactory sanitary condition is of such a nature or magnitude that the district commander or COTP could reasonably determine, based on the detailed results of the inspections conducted by either the FDA or the PHS, that a clear threat to the vessel, crew, passengers or safety exists, enforcement action may be taken under Title 33, CFR, Part 160.111(c). Enforcement action on foreign flag vessels initiated under U.S. law or under the provision of the International Labor Organization Convention Concerning Minimum Standards in Merchant Ships (ILO 147) must be reported in accordance with COMDTINST M16711.12, Enforcement of the ILO 147.

D. TRAVELING INSPECTION AND EVALUATION STAFF

1. Introduction

The traveling inspection and evaluation staff conducts and monitors various inspections and examinations of vessels of particular interest, and provides oversight of field missions with feedback directly to Commandant (G-M). The staff will also conduct special missions and studies in support of inter-division issues to improve commercial vessel safety and increase awareness of marine safety. Based upon the priorities set by the Chief, Office of Marine Safety, Security, and Environmental Protection (G-M), Deputy Office Chief, Associate Program Director, and the Office's Quality Management Board, the vessels targeted for attention by this staff vary. Examples of targeted vessels are: U.S. deep draft vessels over twenty years of age, Trans-Alaska Pipeline Service (TAPS) tankers, large passenger vessels (over 100 GT), U.S. vessels of novel build or design, and U.S. vessels undergoing major conversions, modifications, or life extensions and ACP enrolled vessels.

2. Purpose

Traveling Inspectors perform oversight of targeted vessels and conduct special studies to provide sound technical advice and recommendations to Commandant (G-M) which help form program direction and measure the effectiveness of existing programs and policies. Unit Commanding Officers may request advice or assistance from this specialized and highly experienced staff on issues of particular concern.

3. Interaction with Field Units

In most cases, a representative of the cognizant field command should accompany the Traveling Inspector. Traveling Inspectors do not issue marine inspection deficiency requirements (CG-835s), however they may make recommendations for same to the cognizant OCMI/COTP. Special inspection reports will be submitted by the Traveling Inspector to G-M. Recommendations offered by the Traveling Inspector include an action addressee, generally a program manager or Headquarters Division Chief, who will coordinate any necessary district or field unit action. Copies of special inspection reports will be forwarded by the traveling inspection staff to appropriate districts and field units after approval by G-M.

E. EXEMPTIONS FOR LAID UP, DISMANTLED, OR OUT-OF-COMMISSION VESSELS

Under 46 U.S.C. 3302(e), vessels subject to the vessel inspection laws are exempted from inspection when they are laid up, dismantled, or otherwise out of commission. Under 46 CFR 31.01-1, 70.05-1(a)(2), and 90.05-1(a)(3), tank, passenger, cargo and miscellaneous vessels need not possess a COI when in such condition.

CHAPTER 1: INSPECTION OF VESSELS FOR CERTIFICATION

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CHAPTER 1: INSPECTION OF VESSELS FOR CERTIFICATION

A. INTRODUCTION

This part of the manual provides guidance with regard to inspections leading to the issuance of a Certificate of Inspection (COI). Information concerning miscellaneous decisions and interpretations as a result of inquiries is also included. This guidance is amplified by additional information in other parts of this manual, which are cross-referenced. The responsibilities of the officer in charge, marine inspection (OCMI) and inspection personnel are discussed in volume I of this manual.

B. CERTIFICATION OF VESSELS

1. General Provisions

46 U.S.C. Chapter 33 requires that certain vessels possess a Certificate of Inspection (COI). Issuance of this certificate is dependent upon the satisfactory completion of an inspection for certification[1]. Retention of the COI depends upon the continued maintenance of the vessel in a safe operating condition. The Officer-in-Charge, Marine Inspection (OCMI) is authorized to issue permanent COIs generated by the Marine Safety Information System (MSIS) (see chapter 3 of this volume), or Temporary COIs (Form CG-854) pending issuance of the permanent form, when satisfied that the vessel in question complies with all applicable statutes and regulations and can be operated safely without endangering life or property.

[1]**NOTE:** The initial COI may be completed before issuance of the Certification of Document (COD). The COI should be issued, provided the National Vessel Documentation Center (NVCD) has received the application for documentation. Contact the NVCD about vessel documentation questions.

Government Owned Vessels

a. Government owned vessels may be subject to maritime and environmental safety laws. Check the "applicability" sections of the applicable CFR subchapter to determine if a regulation applies to government vessels.

Jones Act Requirements

b. Jones Act Requirements for Coastwise U.S. Trade: Vessels engaged in coastwise or Great Lakes trade must be built in the United States. For vessel to be considered a U.S. built vessel it must have been constructed totally within the United States. This includes fabricated[2] structural vessel components. There is no allowance for fabrication of even a small portion of major components outside of the United States.

[2]**NOTE:** Construction materials that are otherwise processed per detailed instructions so as to permit simplified assembly with nominal preparation will normally be considered fabricated.

2. Periods of Validity

Introduction

a. Introduction. The periods of validity for a COI vary by vessel type and are specified within the applicable regulations. In general, they are:

(1) **1 year** for passenger, small passenger vessels more than 65 feet in length, Nautical School Ships, and nuclear powered vessels;

(2) **2 years** for cargo, tank, oceanographic research, and miscellaneous vessels; and

(3) **3 years** for small passenger vessels not more than 65 feet in length.

Certificates are normally issued for the maximum period specified in the applicable regulations. A vessel is certificated on its ability to meet the minimum safety standards set forth in the regulations. Under existing law, any vessel meeting these standards is entitled to a full-term certificate. A vessel unable to meet the minimum standards shall be required to correct its deficiencies prior to certification or, if the deficiencies are minor and do not make operation of the vessel unsafe, be granted reasonable time in which to make the necessary corrections. An owner may surrender the COI and apply for inspection for recertification at any time prior to the expiration date. The conditions under which certain vessels on foreign voyages may return to the U.S. with expired certificates are discussed in paragraph B1.C.7 below.

Vessels with Expired COI

A vessel for which the COI has lapsed, regardless of circumstances or reasons, may be required to undergo inspection for certification as a "new vessel" if the owner/operator desires to place the vessel back into certificated service. A determination as to the type and extent of inspection requirements appropriate will be made by the cognizant OCMI after having given due consideration to the

Grandfathering

circumstances giving rise to the vessel's out-of-service period. Environmental conditions such as fresh water, saltwater or drydock lay-up as well as any structural modifications made to the vessel will be critically evaluated. The OCMI may, at his discretion, require a formerly certificated vessel to be inspected as a new vessel regardless of its former status as a certificated vessel. Such vessels would no longer be afforded exemption from regulatory requirements that may have been derived under "grandfather" provisions provided by law, regulation, or policy. A vessel that was once certificated does not qualify indefinitely as an "existing" vessel, especially when it has been structurally modified and/or out of service for an extended period. A vessel whose COI has lapsed will be required to meet those inspection for certification requirements determined to be appropriate by the issuing authority—the OCMI.

One-Year Certificates

b. Regulations permit the issuance of certificates to certain cargo, tank, and miscellaneous vessels for periods of less than 2 years. Examples are one-year certificates for the following:

(1) Vessels equipped with firetube main propulsion boilers, including riveted lap seam boilers;

(2) Vessels that, in the opinion of the OCMI, should be inspected on a one-year basis by reason of route (the Commandant's approval shall be obtained in these cases); and

(3) Nuclear powered vessels.

3. Entries on COIs

Number of Passengers Stated

a. Except for ferryboats, the OCMI is responsible for determining the number of passengers that a vessel has accommodations for and can carry with prudence and safety, as provided for in 46 U.S.C. 3501. That number shall be stated on the COI. The OCMI shall not permit the number of passengers allowed to exceed that permitted by law or regulation, or specified in the vessel's stability letter. See chapter 10 of this volume concerning the number of passengers permitted to be carried aboard an excursion vessel.

Maximum Number of Passengers on Ferry Vessels

b. See Title 46 U.S.C. 451, Notes of Decisions, for guidance on how to compute and list the number of passengers and crew on the COI for Ferry Vessels. 46 USC 451 notes state that …"respecting the number of passengers that may lawfully be carried by a passenger steamer, (46 USC 452 and 453) have no application to a ferryboat, though temporarily employed as an excursion boat." Essentially, ferry vessels are not considered passenger vessels by 46 USC 451, and are considered to be cargo vessels. Accordingly, the number of passengers and crew authorized on a ferry vessel is not to be listed on the COI. However, many Ferry Vessels are a combination of both cargo and passenger vessels. As such, when the OCMI and the owner of a ferry vessel agree on the number of passengers that can be carried safely, and when the owner of the ferry desires it, the maximum number of passengers permitted may be entered on the COI.[2]

c. Tankships Carrying Grain Cargo. No amendment of the COI is necessary for a tankship to carry grain cargo. The Federal Grain Inspection Service provides inspectors to oversee loading of vessels with grain.

[2]**NOTE:** When stability is a factor in limiting the maximum number of persons that can be carried with safety on any ferry vessel, the total number of persons permitted aboard shall be stated in the stability letter.

4. Temporary COIs

A Temporary COI, Form CG-854, provides evidence of the satisfactory completion of an inspection for certification (see 46 U.S.C. 3309). It stands in lieu of a COI and, until replaced by a COI, has all the force and effect of the permanent certificate. The temporary certificate is intended for use when the immediate issuance of a COI is not possible at the completion of an inspection. It is not the Commandant's intention that a COI should be withheld pending correction of minor deficiencies after a temporary certificate has been issued. Further, when the permanent COI can be issued in time to meet the vessel's needs, no temporary certificate should be issued.

5. Seasonal Restrictions

Seasonal limitations are intended to ensure the overall seaworthiness of the vessel and the safety of the passengers carried under differing operational conditions, without completely halting the operation of the vessel during any specific period of time. COI statements of seasonal restrictions shall be as descriptive as possible, showing limitations on vessel routes, the scope of passenger carrying authorizations, and the like.

6. Certificates Expiring At Sea

Extensions Not Granted

a. There are no statutory provisions that allow for the extension of a COI. Accordingly, requests for extensions of certificates shall be denied.

Expirations of COIs During Foreign Voyages

b. Under 46 U.S.C. 3314, a vessel may complete a foreign voyage to a port of the U.S. within 30 days of the expiration of its COI without incurring penalties for operating without a valid certificate. The vessel owner/operator must apply for an inspection for certification at the first U.S. port of call. The inspection for certification shall be completed, and a new COI issued, or a Permit to Proceed shall be issued, provided an inspection for certification has been conducted to the point that the OCMI considers the vessel safe to proceed on the voyage (See Section A, Chapter 6 of this volume).

Vessels Sailing <15 Days Prior To Expiration of COI

c. 46 U.S.C. 3314 prevents the grace period described above from being applied if the COI would expire within 15 days of the date of sailing from a U.S. port. A vessel would not violate this provision merely by sailing to a foreign port within 15 days of the expiration of the COI, as long as it can complete a round trip to that port in less than 15 days before the certificate expires. However, such a vessel would be in violation if it sailed within 15 days of the expiration date and failed to return before expiration of the certificate.

7. Marking of Hailing Ports

Under 46 CFR 67.123, a hailing port must be marked on some clearly visible exterior part of the stern of a documented vessel. The markings must be durable and made in clearly legible letters of the Latin alphabet or Arabic or Roman numerals of no less than 4 inches in height.

8. U.S. Vessels Operating in Foreign Waters for Extended Periods

Questions have been raised concerning the following proposed operation of a U.S. tank vessel: the vessel would be permanently anchored in Venezuelan territorial waters for the express purpose of storing crude oil to be subsequently transferred to vessels coming alongside. While the vessel is permanently anchored, the engineering plant would remain in a standby condition so that, in the event of emergency, the vessel could be moved to a place of safety. It would be manned by two licensed deck officers and two licensed engineers who would generally maintain the vessel, to supervise the transfer of cargo from its tanks to other vessels, and to move the vessel should it be necessary.

As a U.S. tank vessel, it would be subject to inspection and certification under 46 U.S.C. Chapter 33 and 46 CFR, Subchapter D. For the manning of such vessels, as stated in 46 CFR 31.15-1, the OCMI must specify on the COI the number of officers and crew that, in his or her judgment, would be necessary for its safe operation. The complement could be amended by endorsement on the certificate, as a result of changed conditions of employment. Under the regulations, special manning requirements may be set governing particular operating conditions of the vessel. However, such requirements must be within the statutory limitations relating to the manning of vessels (46 U.S.C. 8301). 46 U.S.C. 3311 states that a vessel subject to inspection may not be operated legally without a valid COI. Therefore, as long as it is operated, the vessel could not be exempted from inspections by "permanent" anchoring in Venezuelan waters and would be subject to periodic inspections for certification.

9. Vessels Constructed for Sale to Foreign Interests

When inspection is requested for a vessel being built for sale to foreign interests, the OCMI shall inquire whether the vessel is intended to operate under the U.S. flag. If the reply is affirmative, inspection should be undertaken upon application by a citizen legally entitled to have the vessel documented under U.S. law. If the reply is negative, inspection shall not be undertaken.

10. Towing of Vessels Permanently Laid-Up, Dismantled, or Out-of-Commission

Vessels are frequently towed for purposes of permanent removal from navigation or scrapping as these vessels reach the end of their useful lives. It has been generally determined that such vessels making a one-way voyage under tow, without crew, cargo, or passengers and not holding documents as a merchant vessel, are not subject to inspection and certification requirements as they are "laid up, dismantled, or out of commission" as envisioned in 46 U.S.C. 3302(e) and 46 CFR 90.05-1(a)(3). In accordance with this determination, when the OCMI is satisfied by documentary evidence or other means that certain conditions are met, such vessels do not require a COI. These conditions may include some or all of the following:

- Is not currently documented by the Coast Guard;
- Will carry no passengers or cargo;

- Will be towed and unmanned;
- Is making a one-way voyage for purposes of scrapping or permanent removal from navigation;
- Is not intended to be used in commerce during the voyage; and
- Will pose no threat to life, property, or the environment while in U.S. waters.

NOTE: Such vessels do require a Load Line Exemption Certificate. See MSM, Volume IV, Chapter 6 for guidance.

b. The U.S. Customs Service has determined that although such vessels require clearance before being towed to a foreign port, verification by the OCMI to the effect that "(name of vessel), being towed on a one-way voyage for purposes of scrapping, etc., is not required to hold a COI" will suffice for clearance purposes.

Carriage of Scrap

d. Scrap metal carried for ballast in such vessels will not be classed as cargo to meet the requirements above, as long as the amount, location, and method of stowage of scrap is acceptable to the OCMI and does not exceed the tonnage of liquid ballast that would normally be employed. When the matter of what constitutes cargo is at issue, Commandant (G-MOC) should be consulted.

Requirements for Passage Through the St. Lawrence Seaway

e. Vessels subject to the Load Line Acts (46 App. U.S.C. 86 or 88) and the their own power for decommissioning in other than a U.S. port, require load line and inspection certificates before leaving a U.S. port. This policy is not intended to contravene or supersede requirements of the Canadian government with respect to passage through Canadian waters and clearance from Canadian ports. Owners of such vessels should contact the Director, Marine Regulations Branch, Department of Transport, Ottawa, Ontario, Canada, for further information in this regard. Owners of such vessels intending to transit the waters of other countries should contact officials of those countries. The issuance of an “International Load Line Exemption Certificate,” by the local OCMI may be required. For further information and guidance, see MSM Volume IV, Chapter 6, and for applicable regulations, see 46 CFR 42.03-30(b)(3).

11. Vessels Operating in South-eastern Alaska

46 CFR 2.01-80 states that the waters of southeastern Alaska, inside of the general trend of the shore from Cape Spencer, southeasterly to Cape Muzon, and thence easterly to Sitklan Island, shall be considered "lakes, bays, and sounds other than the Great Lakes" for administration of the vessel inspection laws and regulations. The waters between southeastern Alaska and Prince Rupert, BC via Chatham Sound likewise have been classed "lakes, bays, and sounds" for purposes of vessel inspection. The "Inside Passage" between southeastern Alaska and Puget Sound is considered "lakes, bays, and sounds" for inspection and licensing purposes only if certain conditions are met. Approval by Commandant (G-MOC) is required for vessels to operate between southeastern Alaska and the state of Washington under these considerations.

12. Dual Certification for Passenger-Carrying Vessels and Sailing School Vessels

Under existing regulations, a qualifying vessel may be operated in service part-time as a sailing school vessel and at other times as a passenger-carrying vessel (Subchapter T or H). 46 CFR 169.103(b)(5) states that the sailing school regulations are not applicable when a vessel is operating under the authority of a current valid COI as a passenger-carrying vessel. This regulation was written specifically to clarify the dual service situation. Although the regulations allow for dual certification, the OCMI may be reluctant to issue a certificate, let alone two, without conducting an inspection each time the operator physically alters the vessel as it shifts from one service to the other. General practice is to issue only one certificate at a time for the appropriate service, thus creating both an administrative and an inspection burden each time the vessel changes service. Alternatively, the OCMI may issue a single COI, under the conditions addressed below, to cover both services.

Single COI for Predominant Service

a. OCMI's may issue a single COI for the vessel's predominate service with an endorsement for the alternative service. Before issuing such a COI, the OCMI should be reasonably satisfied that the vessel is constructed, maintained, and outfitted in compliance with the applicable regulations regardless of which service the vessel is in at any given time. This requires the vessel to meet the more stringent requirements between 46 CFR 169 and either Subchapter T or H at all times. This procedure should enable the OCMI to avoid some degree of inspection each time the vessel shifts from one service to the other. With the vessel's material condition and outfitting fixed, operating conditions, manning, and possible total persons allowed may vary depending upon the applicable regulations and can be addressed accordingly in the endorsement for the alternative service. In cases where the OCMI finds it appropriate and practicable to permit outfitting to vary, such variance should also be addressed in the endorsement.

Period of Validity

b. Regardless of the predominate service under which the vessel will be certificated, there could be substantial use of the vessel in the alternative service for which the COI is endorsed. Consequently, the vessel must be certificated for a period that is consistent with the more stringent requirement, whether it be for the predominate service for which the certificate is issued or the lesser service for which the endorsement is added. The intervals for inspections, and drydock and tailshaft exams must also be based upon the more stringent of the regulatory requirements. An owner or operator must accept the application and maintenance of the more stringent requirements as a requisite to obtaining the benefits of a single COI, as opposed to trading COIs every time the vessel changes service and submitting to inspection as deemed necessary by the OCMI.

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13. Inspection of U.S. Vessels in Foreign Countries

The following offices have responsibility for foreign marine inspection:

a. MSO Puget Sound. Zone to include the western coast of Canada.

b. MSO San Diego. Zone to include the western coast of Mexico north of latitude 20 North.

c. MSO New Orleans. Zone to include South and Central America, the western coast of Mexico south of latitude 20 North, and all of the eastern coast of Mexico.

d. MSO Boston. Zone to include the eastern coast of Canada.

f. Far East ACTIVITIES: Asia and Diego Garcia.

e. ACTIIVITIES Europe, Europe, the Mediterranean Sea, the Red Sea, the Persian Gulf, the Arabian Sea, and all of Africa.

NOTE: For areas in question or new construction projects, Commandant (G-MOC) should be contacted.

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14. Certification of Vessels Undergoing a Reflag and/or Major Conversion

a. NVIC 10-81, CH-1, was developed to allow certain categories of existing foreign flag vessels to be brought under U.S. flag in a manner consistent with the principles and levels of safety in current Coast Guard regulations or, as in some cases, to Coast Guard standards in effect at the time of the vessel's construction. The NVIC makes reference to acceptance of vessels between 2-10 years old for reflag and conversion. Older vessels will not be precluded if they can be made to meet the SOLAS Method I-C Structural Fire Protection Requirements, as amended in 1981, in addition to all other requirements prescribed in the NVIC. In addition, NVIC 10-81 can be used as a guideline for existing vessels that undergo a major conversion, are brought under Coast Guard inspection, or wrecked vessels that are able to register under 46 U.S.C. 14.

b. Major Conversion Determinations. Determinations of major conversions are made by Commandant (G-MOC). It is important that vessel owners contemplating work which may constitute a major conversion contact Commandant (G-MOC) as soon as they have a general concept of the work to be performed so it can be reviewed. The Coast Guard bases major conversion determinations on 46 U.S.C. 2101(14a). This defines major conversion as a conversion that:

(1) Substantially changes the dimensions or carrying capacity of the vessel;

(2) Changes the type of the vessel;

(3) Substantially prolongs the life of the vessel; or

(4) Otherwise, so changes the vessel that it is essentially a new vessel.

Special Provisions for the Reflag of Vessels Participating in the Maritime Security Program (MSP)

c. Special Provisions for the Reflag of Vessels Participating in the Maritime Security Program (MSP):

(1) BACKGROUND: The Maritime Security Act of 1996 became law as an amendment to Title VI of the Merchant Marine Act of 1936. MSP is administered by the U.S. Maritime Administration (MARAD) Office of Sealift Support (MAR-630) and establishes a program for direct U.S. government payment to private vessel owners for the right to use designated U.S. Flag vessels to carry military cargo in time of war, national emergency or military contingency. These privately owned and operated commercial vessels will normally be employed in commercial operations unless called upon by MARAD for military operations. Foreign flag vessels may apply for MSP but must reflag to U.S. flag as a condition of participation. MSP vessels are not (and will not become even upon activation) public vessels as defined by 46 U.S.C. 2101 (24). These vessels will be U.S. documented vessels, subject to inspection and certification by the Coast Guard. Separate legislation contained in the Coast Guard Authorization Act of 1996 provides that reflagged MSP vessels need only comply with ABS class rules (or the rules of another class society accepted by the Coast Guard) and international convention requirements provided that the vessel meets the following eligibility conditions:

(2) ELIGIBILITY CONDITIONS FOR REFLAG UNDER MSP: The Coast Guard may accept previously conducted class society surveys and previously issued international certificates in lieu of establishing equivalency to U.S. regulations for all vessel equipment and systems, provided:

(a) the vessel is classed by and designed in accordance with the rules of the American Bureau of Shipping or another classification society accepted by the Coast Guard,

(b) the vessel complies with applicable international agreements and associated guidelines, as determined by the country in *which* the *vessel was* documented immediately *before becoming a U.S.* documented *vessel,* and

(c) that the country under which the vessel is currently flagged has not been identified by the Coast Guard as inadequately enforcing international vessel regulations on the vessel making application for certification.

In order to carry out the conditions in the paragraph above, the following procedure shall be followed to issue the initial certificate of inspection and international certificates for a foreign vessel entering MSP.

(3) FOR MSP AND APPLICATION FOR INSPECTION:

(a) MARAD Headquarters (MAR-630), will notify Commandant (G-MOC) when a foreign flag vessel is being considered for selection for participation in MSP. G-MOC-2 will conduct a review of the vessel's Port State Control boarding history in MSIS and notify MARAD of any significant instances of past non-compliance with international regulations. MARAD will notify G-MOC-2 and the vessel owner if the vessel has been selected for MSP participation.

(b) The vessel owner will make application for inspection to the OCMI in whose zone the reflag inspection will be conducted. If that location is not known at the time of acceptance into MSP (to facilitate timely plan review) the owner may make application to Commandant (G-MOC-2) who will hold the application for forwarding to the cognizant OCMI when an inspection location has been selected. A copy of the application shall be provided to Commanding Officer, Marine Safety Center.

(4) PLAN REVIEW TO VERIFY SOLAS COMPLIANCE FOR MSP:

(a) The vessel owner shall submit the items below to the Commanding Officer, Marine Safety Center for review in order to verify compliance with SOLAS, MARPOL, ILLC and verification that the vessel is designed in accordance with the rules of the American Bureau of Shipping or other accepted class rules.

(b) Where the vessel has been classed and designed in accordance with rules other than ABS, the Marine Safety Center shall determine acceptance on a case-by-case basis for the purpose of MSP participation only. This acceptance of class rules and design for MSP shall not be construed as acceptance for any other inspection program.

(c) The vessel owner, flag state/class society shall identify all areas where previous equivalence or exception has been granted to SOLAS, MARPOL, ILLC or the design rules of the American Bureau of Shipping or other accepted class rules.

(d) Plans to be submitted:

(i) General Arrangement plans

(ii) Structural fire protection division rating plans (assuming Method I construction, MSC will spot check fire boundary ratings and ventilation details, i.e., penetrations by the ventilation system of fire rated divisions).

(iii) Fire detection system plans (to verify placement and overall system design).

(iv) Fixed fire extinguishing system plans (a minimum 20 second time delay for releases into manned spaces shall be required even though this is not specified in SOLAS).

(v) Automation system plans including a qualitative failure analysis for vital systems, or a letter from the classification society stating that the systems are designed to meet the failsafe requirements of SOLAS.

(e) Plans to be submitted for verification of class approval. The following information/plans and classification society approval letters must also be submitted, but generally will be examined only to verify the approval action of the classification society and will not undergo Marine Safety Center design review or OCMI inspection unless problems or unusual items are noted:

(i) Trim and Stability booklets including lightship properties and stability test data.

(ii) Letter from the flag state/class society indicating the vessel meets probabilistic damage stability requirements - for vessels built after 1 February 1992.

(iii) Letter from flag state/class society indicating review/approval of the following items, with all areas requiring special attention/inspection noted:

- Structures
- Fire main systems
- Bilge systems
- Steering gear and steering gear alarm systems

(5) OCMI INSPECTION FOR INITIAL CERTIFICATION

(a) Issuance of the initial certificate of inspection is subject to:

(i) A satisfactory onboard inspection by the cognizant OCMI, conducted with a surveyor from the vessel's class society or flag administration who can explain interpretations of SOLAS, MARPOL and ILLC of the previous flag state.

(ii) The owner's providing the OCMI with access to the last annual survey report of the classification society, the list of outstanding class recommendations and statutory requirements, the latest drydock survey report (including latest gaugings).

(iii) A list of systems, equipment or other items that meet a standard different from the U.S. Statutory requirements for a vessel of that size and service. (eg. pressure vessels that are not ASME stamped or lifejackets that are not Coast Guard approved). This list is consistent with Coast Guard reflag policy of the past which has shown that the ability to rapidly identify these items greatly speeds the initial reflag inspection. The list will allow inspectors to identify and document items in the vessels inspection record that meet international, class or previous flag administration interpretations of standards. This is necessary to avoid duplication of this effort at subsequent inspections. It will also eliminate the need for the owner to continue providing a representative of previous flag administration at subsequent inspections.

(b) Conduct of the inspection: The initial inspection shall be sufficiently detailed to verify full compliance with international regulations. The procedures applicable to foreign vessel port state control annual examinations described in MSM II-D1 shall be used as a guideline for the scope of the initial examination. The class society/flag administration representative in attendance shall be consulted in all areas where the inspector requires guidance as to the specific application of a particular international regulation. If the class society/flag administration representative in attendance verifies that the item in question is satisfactory under their guidelines, it will be accepted by the OCMI. A record of all items on the vessel that are acceptable to the class society/flag administration representative, but that differ from current Coast Guard enforcement policy for that item, shall be noted by the inspector as a marine inspection special note (MISN) in MSIS at the conclusion of the inspection (NVIC 10-81, CH-1, provides a useful summary of Coast Guard requirements to use as a comparison to international requirements). Satisfactory fire and abandon ship drills are required to be performed in the

presence of the Coast Guard marine inspector. The drills shall be conducted prior to issuance the initial certificate of inspection, but after a U.S. crew has been placed onboard the vessel. In addition to the inspection described in MSM II-D1, the inspector may verify that all current structures, equipment or systems on the vessel are in agreement with the plans reviewed by the Marine Safety Center or approved by the classification society/flag state. The scope of the plan verification shall be at the discretion of the OCMI, but should generally be conducted as a spot check.

(c) Engine Automation test and If the vessel requests reduced manning as a result of engine automation then the automation test procedure and approval shall be in accordance with U.S. regulations and vessel inspection policy (eg. NVIC 169, NVIC 6-84 and NVIC 10-81, CH-1). The test procedure will be reviewed by the Marine Safety Center (see paragraph (C)(4)(e) of this section). *"The final manning requirements shall be established based upon satisfactory results of:* (1) a *complete plan review of* the equipment, and *the monitoring safety and labor saving devices* installed, (2) *a period of proven* operation *and reliability following* the initial *testing and* de-bugging, *(3) a period of Coast Guard on-board observation, and (4) for* unattended *machinery operation, an acceptable* plant maintenance *program which Insures* the continued quality *of the demonstrated* plant reliability" (NVIC 1-69).

(d) Deficiencies. Any area considered deficient as a result of the Coast Guard examination described in D1 (annual examination) shall be subjected to an expanded examination in accordance with the procedures described in Section D, Chapter 1. Expanding the scope of the examination shall be based on the principle of "clear grounds" as defined in D1 of this manual.

(e) Drydocking/Internal Structural examination: A separate drydock examination and comprehensive internal structural examination (including entry and examination of ballast tanks, and double bottoms) shall not be required in conjunction with the initial certification unless "clear grounds" exist to require it. The drydock date will be established and continued in accordance with the schedule previously established by the flag state/classification society. If the credit drydock and/or internal examination is coincidental to initial certification, the inspector shall conduct the examinations) in accordance with the guidelines established by the previous flag state/classification society.

(f) Pollution Prevention: The vessel shall comply with all U.S. regulations and international pollution prevention requirements that would be applicable to a foreign vessel calling in a U.S. port.

(g) Issuance of certificates upon satisfactory initial examination:

(i) Certificate of Inspection: Upon satisfactory completion of the initial inspection the vessel will be issued a certificate of inspection for the route and service specified on its existing statutory certificates. A reduction in manning due to engine automation must be approved and tested as satisfactory in accordance with U.S. regulations and policy for reflags conducted under NVIC 10-81 (CH-1). The OCMI shall place the following endorsement on the certificate of inspection and as a special note in MSIS:

"This vessel is certificated under the provisions of the Maritime Security Program (MSP) and is inspected and certificated solely in accordance with the requirements of class rules and international convention requirements as applicable. This vessel was issued its initial certificate of inspection in accordance with the MSP on DD MM YY." (Insert date inspection is complete).

(ii) International Convention Certificates: SOLAS, MARPOL an ILLC certificates will be issued by the Coast Guard or by a classification society that is authorized to issue the certificate on behalf of the Coast Guard. This includes authorization granted under existing agreements, new agreements under 46 CFR Part 8, or the Alternate Compliance Program.

(iii) OCMIs shall document and record in MSIS as a marine inspection special note (MISN) any areas where the previous flag administration or class society accepted a system or equipment which differs either from the Coast Guard's statutory requirements or its enforcement of international regulations.

(h) OCMI action if initial inspection is unsatisfactory: If based on the results of the initial inspection by the OCMI there is sufficient evidence to show that the country under which the vessel is currently flagged has been inadequately enforcing international vessel regulations on the vessel making application for certification, the COI shall be withheld and Commandant (G-MOC) notified. OCMIs are strongly encouraged to call upon the assistance of the traveling inspectors at Commandant (G-MO-1) when the initial inspection of an MSP vessel indicates clear grounds for an expanded examination. Commandant (G-MOC) will notify the Maritime Administration that the vessel is not currently acceptable to receive a COI. Commandant and MARAD will then consult as to whether the vessel should be allowed to make repairs or modifications in order to complete certification for entry into MSP, or whether the vessel should be excluded from MSP participation.

(i) Payment of User fees and Overseas inspection expenses: User fees shall be paid prior to the conduct of the initial inspection for certification. Travel and per diem costs for overseas inspections shall be paid in advance on a cost estimated basis. If owners cannot arrange for advance payment of user fees or travel costs (overseas only) due to scheduling difficulties, then Commandant (G-MOC) shall be contacted to determine if a delay in payment will permitted until after the inspection has commenced.

(6) INSPECTION OF MSP VESSELS SUBSEQUENT TO INITIAL INSPECTION

(a) MSP vessels will continue to be inspected under the preceding guidelines for all subsequent inspections except as noted below.

(i) Intervals for subsequent inspection shall be in accordance with international convention certificate requirements.

(ii) Vessels accepted under MSP reflag shall be reissued a COI biennially upon application from the owner if the vessel has completed all scheduled inspections for the maintenance of class and international convention certificates (including all annual endorsements, surveys and drydockings).

NOTE: Future plans are to harmonize the COI period of validity with the intervals prescribed for the issuance of international convention certificates.

(iii) OCMIs shall continue to conduct inspections in accordance with the class rules, SOLAS, MARPOL and ILLC. Areas where the previous flag administration or class society accepted a system or equipment prior to reflag which differs from the Coast Guard's current statutory or policy interpretation for the implementation for that international regulation (at the time of the initial inspection) should have been recorded as a Marine Inspection Special Note (MISN) at the initial inspection. New Installations, or modifications to existing systems, made subsequent to the initial reflag shall conform to the Coast Guard's interpretation of international regulations at the time of the modification in so far as reasonable and practical.

(iv) MSP vessels that elect to enroll in the Alternate Compliance Program (ACP) may employ ACP inspection procedures subsequent to the initial reflag inspection, which will be conducted by the Coast Guard.

(v) User fees shall be paid in a manner consistent with all U.S. certificated vessels.

15. Vessels of Novel Design

Proposed Operation

a. From time to time, the OCMI will be approached with some novel operation proposal, that is not covered by any or a part of regulations. In such cases, the OCMI will coordinate the proposed operation and associated inspection requirements through the District Commander (m) to Commandant (G-MOC).

Regulatory Requirements

b. Commandant (G-MOC) in consultation with the cognizant OCMI will determine the level of regulation that will be applied to vessels in “novel” operations not covered by any or part of regulations.

C. PRE-INSPECTION PROCEDURES

1. Application for Inspection of U.S. Vessel, Form CG-3752

Application for inspection of a vessel for certification shall be made by the master, owner, or agent on Form CG-3752 (see 46 CFR 2.01-1 and 176.01-10). The application for initial inspection of a vessel being newly constructed or converted shall be submitted prior to the start of such construction or conversion. This shall be followed by the submittal of plans and specifications required by the applicable regulations. Applications for inspection shall be submitted to the cognizant OCMI. When an application is received by an office other than that having jurisdiction, it shall be forwarded to the appropriate OCMI and the applicant so advised. Inspection for certification shall not commence until a proper application has been submitted by a U.S. citizen and the proposed operation of the vessel (use, route, passengers, etc.) is known to the OCMI and the inspector.

2. Preparation by the Inspector

The marine inspector shall be as well informed as possible of the vessel's proposed operation (and its past history, as applicable) before commencing the inspection. Due to the many differing circumstances encountered, the availability of such information will vary. Generally, the following procedures shall be used:

a. Before inspection is begun, previous inspection records shall be reviewed by the inspector. For initial inspection, copies of all approved plans, specifications, and relevant correspondence, and any record of outstanding deficiencies shall also be reviewed by the inspector.

b. When the owner, agent, or master of a vessel previously inspected in another zone applies for inspection, the OCMI should obtain the inspection records for the previous inspection for certification and drydocking examination from the certificating OCMI. Such records shall be returned after the inspection is completed, unless the vessel has permanently changed its principal port of operation to the zone where inspected (See Section A, Chapter 2 of this volume).

D. CONDUCTING INSPECTIONS FOR CERTIFICATION

1. Initial Inspections

Definition

a) The initial inspection for certification is the first inspection held on a vessel during or after construction or conversion. It is a prerequisite to the issuance of the original COI.

Purpose

b) At the initial inspection, the inspector ascertains that the vessel has been built (or converted) and equipped in accordance with the applicable regulations, construction standards, and approved plans and specifications, and that its condition warrants the judgment that it can be operated with safety to life and property in the service and route(s) specified. The inspector also ensures that the condition and installation of all equipment and apparatus thereof comply with applicable regulations. It is intended that the initial inspection be carried out with special attention to detail. All unusual circumstances that require interpretations of regulations, special considerations, the use of substitutions or equivalents, etc., shall be carefully considered; when deemed acceptable, they shall be made a matter of record (see 46 CFR 50.20-35).

Policies Concerning ABS Classed Vessels

c) Guidelines are clearly established in NVIC 10-82 for the acceptance of ABS plan review and inspection during the initial inspection. Areas of shared reviews and inspections and areas retained solely by the Coast Guard are delineated. Most vessels classed by ABS will fall under NVIC 10-82. When the provisions of NVIC 10-82 are not followed, ABS will perform plan review and inspection for class only, and will not review or inspect for regulatory requirements. If an inert gas system (IGS) or crude oil washing (COW) system is installed in a vessel for which the owner has requested ABS review and inspection, the Coast Guard will accept ABS approval and inspection if a letter certifying compliance with regulatory requirements for the systems is provided by ABS. NVIC 10-82 also applies to major conversions. Questions concerning the applicability of NVIC 10-82 shall be referred to Commandant (G-MOC) for resolution. For further information on stability see NVIC 3-84, "Acceptance of Stability Related Review Performed by the American Bureau of Shipping for New U.S. Flag Vessels."

Timeliness of the Inspection

a. When possible, the initial inspection shall be conducted throughout the construction and fit-out period, with a final review of the condition of the vessel and its equipment upon completion of the construction and fit-out. Vessels being converted shall be inspected throughout the conversion period. The inspector shall call to the attention of the builder and contractor any defects noted as soon as possible so that timely corrections can be made. The inspector shall notify the OCMI of any controversial items so that they may be

resolved, if possible, before work continues (See Section A, Chapter 2 of this volume concerning the handling of deficiencies).

Scope of the Inspection

b. The inspection shall be sufficient to determine that the vessel: is suitable for the service and route(s) in which it is to be employed; is equipped with the proper lifesaving and fire protection appliances as prescribed by the regulations; has suitable accommodations for passengers and crew; is in a condition to warrant the judgment that it may be used in navigation with safety to life, property, and the environment; and in all other respects fully complies with the requirements of applicable statutes and regulations, including those for pollution prevention and navigation safety.

Compliance with Plans and Specifications

c. When inspecting new construction or conversion, it is essential for the inspector to have available corrected copies of the approved plans and specifications. These shall be considered work copies, furnished for the use of the inspector during construction, and for the OCMI's files after construction. If additional copies are needed for office use or filing, they shall be requested from the submitter. Most plans and specifications are approved subject to comments placed in their transmittal letters. These letters are referred to in the approved plans and specifications and shall be made available to the inspector who oversees the construction or conversion work. When approval is given subject to comments or recommendations of ABS or another recognized classification society, such comments or recommendations shall also be made available to the inspector. As each deck and engineering installation must be made to the satisfaction of the OCMI, the inspector shall check the complete installation for safety and compliance with applicable standards, as well as the plans and specifications. Any errors or omissions in plans that would result in unsafe conditions or noncompliance with applicable standards shall be promptly brought to the attention of the builder and the OCMI for resolution.

Restricted Visibility from the Navigating Bridge

d. Restricted Visibility from the Navigating Bridge.

(1) General. Restricted visibility from the navigating bridge is most often encountered on container vessels, large tank vessels with the bridge aft, vessels with oversize cargo handling gear, and special purpose vessels such as MODU's and crane ships; however, it may occur on any type of vessel. In most cases, this problem will be identified and resolved in plan review. In those cases when restricted visibility becomes apparent after the start of construction, the matter should be brought to the attention of the owner as early as possible, to avoid costly modifications late in the construction of the vessel. Technical guidelines for bridge visibility are contained in volume IV of this manual.

(2) Causes of Restricted Visibility from the Navigating Bridge.[1] These can be separated into two broad categories: those where the obstruction is movable or temporary (such as container deck loads) and those where the obstruction is permanent (as in a vessel structure). As situations of the first category are operational in nature, certification of a vessel with this type of visibility restriction should not be withheld. However, the problem should be brought to the attention of the owner so that the owner may take appropriate action to remove obstructions to visibility that interfere with the safe navigation of the ship. Situations of the second category are permanent in nature and cannot be operationally controlled after the vessel is in service. Therefore, a vessel with this type of obstruction should not be certificated when, in the opinion of the OCMI, visibility from the navigating bridge is restricted to such a degree that the vessel cannot be navigated safely.

[1]**NOTE:** Tinted windows may also restrict visibility. They are prohibited by regulation (e.g., 46 CFR 92.03-1(c) and by policy to meet the intent of the requirements of 33 CFR 164 to maintain clear unobstructive visibility for promoting safe navigation; unless it can be demonstrated that the amount of light transmitted through them is equivalent to that transmitted through clear glass.

Trial Trips

e. Trial Trips. Upon completion, and before initial certification, an inspector is required to observe the operation of each new vessel during a trial trip. The specific regulations covering trial trips are in 46 CFR 58.01-30 and 31.10-40, although others apply as well. A vessel on a trial trip is not required to have a COI nor will it necessarily possess a certificate of documentation issued by the Coast Guard. For practical purposes, the Commandant has not insisted on strict application of COI requirements to a new vessel on a trial trip, because the trip is:

(1) Usually of short duration;

(2) Frequently made with Coast Guard inspectors aboard;

(3) One of the final incidents of Coast Guard inspection prior to the initial issuance of a COI; and

(4) Usually made with the equipment required for a COI, with the vessel operated by licensed and certificated personnel.

The inspector observing a trial trip does not supervise and instruct vessel personnel. Although specific matters may be referred to the inspector for advice, the supervision of the tests according to the trial schedule rests with the builder's representatives. However, as part of the initial inspection of any vessel, the inspector may require such tests as he or she deems necessary to be assured of the safety and seaworthiness of the vessel.

2. Subsequent Inspections for Certification

These are the periodic inspections held after the initial inspection.

Intent

a. At subsequent inspections for certification, the inspector shall ascertain that the vessel and its equipment are being maintained in a safe condition, in accordance with applicable laws and regulations, and determine whether changes have occurred in the vessel tending to make its continued operation unsafe. It is intended that these subsequent inspections be carried out with special attention to the condition of the vessel and its equipment. Deficiencies noted shall be handled as provided in chapter 2 of this volume. The inspector shall be especially alert to detect unauthorized changes to the vessel and its equipment. Upon completion, the inspector and the OCMI must be satisfied that the vessel may be operated safely in the proposed service for the period covered by the COI, and that it otherwise complies with the applicable laws and regulations.

Inspector's Obligations

b. In appraising the condition of a vessel and its equipment, the inspector shall use all available evidence, including the latest inspection findings, records of previous Coast Guard inspections, the opinions or records of other interested surveyors or inspectors, information furnished by the officers and crew, facts concerning the vessel's classification, and previous certification. [2] The inspector may seek the advice of experts in the particular field involved, such as boilermakers, shipfitters, and welders, or the opinion of more experienced inspectors or technical personnel assigned to his or her unit. Based on this evidence and his or her own inspection, the inspector shall reach an independent conclusion as to vessel and equipment conditions and shall act accordingly. The OCMI shall be consulted when there is doubt in the inspector's mind as to a proper course of action.

[2] **NOTE:** See 46 U.S.C. 3315 concerning the disclosure of sources of information.

Scope of Inspection

c. The inspection shall be of sufficient scope to determine that the vessel has a structure suitable for the service in which it is to be employed; is equipped with the proper lifesaving, fire protection appliances, pollution prevention, and navigation safety as prescribed by appropriate regulations; has suitable accommodations for passengers and crew; is in a condition to warrant the judgment that it may be navigated safely; and in all other respects fully complies with the applicable laws and regulations. The inspector shall also determine that the boilers and appurtenances thereof, the unfired pressure vessels and appurtenances thereof, the propelling and auxiliary machinery, the electrical apparatus, and all other equipment conform with the applicable laws and regulations, and that the vessel may be safely employed in the service proposed

E. HULL INSPECTIONS

1. General Concerns

The inspector shall determine the adequacy of the complete hull structure by the review of plans before construction; review of approved plans during construction, reinspections of the hull after construction, and examination of any repairs or alterations. Approved plans and the ABS Classification Certificate may be accepted by the OCMI in certain cases as evidence of the structural efficiency of the hull. However, the inspector must perform sufficient examinations and tests of the hull structure at the inspection for certification to determine that the condition of the hull is suitable for the vessel's service and is such that the vessel may be navigated safely. Additionally, all protected and unprotected saltwater ballast tanks shall be inspected at least twice in a 5-year period. Appropriate entries shall be made on the Vessel Inspection Record (Form CG-2832) as to which tanks have been examined. The inspector shall ensure that the regulations regarding watertightness and weathertightness of the hull, including weather decks, are strictly enforced. Particular attention shall be given to cargo hatches, closures, securing devices, gaskets, means of attachment, etc.

Taken from: **TABLE 91.40-3(a) & (b)—SALT & FRESH WATER SERVICE VESSELS EXAMINATION INTERVALS IN YEARS**

	Single hull ship and barge		Double hull barge with internal framing[1]		Double hull barge with external framing[2]		Single hull barge with independent tanks[3]		Wood hull ship and barge		Unmanned deck cargo barge[4]		Unmanned double hull freight barge[5]	
SW=Salt Water Service FW=Fresh Water Svc	**SW**	**FW**	**SW**	**FW**	**SW**	**FW**	**SW**	**FW**	**SW**	**FW**	**SW**	**FW**	**SW**	**FW**
Drydock	2.5	5	5	10	5	10	5	10	2.5	2.5	5	10	5	10
Internal structural	2.5	5	2.5	5	2.5	5	2.5	5	2.5	2.5	2.5	5	2.5	5
Cargo tank internal	[6]2.5	[6]5	[6]5	[6]5	[6]10	[6]10	[6]10	[6]10	[6]2.5	[6]2.5	----	----	[6]5	[6]5

NOTE:

1 Applicable to double hull tank barges (double sides, ends, and bottoms) when the structural framing is on the internal tank surface.

2 Applicable to double hull tank barges (double sides, ends, and bottoms) when the structural framing is on the external tank surface accessible for examination from voids, double bottoms, and other similar spaces

3 Applicable to single hull tank barges with independent cargo tanks which have a cargo containment envelope that is not a contiguous part of the hull structure and which has adequate clearance between the tanks and between the tanks and the vessel's hull to provide access for examination of all tank surfaces and the hull structure.

4 Applicable to unmanned/non-permissively manned deck cargo barge which carries cargo only above the weather deck and which provides complete access for examination of the inside of the hull structure.

5 Applicable to unmanned/non-permissively manned double hull freight barges (double sides, ends, and bottoms) the arrangement of which provides access for a complete internal structural examination as defined in §91.40-1(b) without the necessity of entering cargo tanks or holds.

6 Or as specified in Part 151.

2. Older Vessels

Inspection of Older Vessels

a. The determination of the true condition of a vessel and its equipment may be more difficult for an older vessel. In this regard, the inspector should make every effort to research an older vessel's records to detect any recent structural, machinery or equipment failures/problems. An increase in the rate of failures may indicate a general deteriorating condition. The inspector should review the most recent hull gauging report as an aid in determining:

(1) Whether additional or new gauging is called for; and

(2) What area(s) of the hull might require special attention?

The inspector is not limited by regulations from making such tests or inspections, as he or she deems necessary to be assured of the safety and seaworthiness of the vessel. Machinery tests, hull gauging (see paragraph B1.F.3 below), inspections of equipment, etc., may be required when deemed necessary by the inspector regardless of regulatory requirements or the type of inspection being performed (e.g., inspection for certification, reinspection, drydocking, or deficiency check).

Notification of Travelers

b. Notification. Commandant (G-MO-1) shall be notified when any vessel 20 years of age or older and over 4,000 GT is scheduled for an inspection for certification and/or drydocking. Traveling inspectors from Headquarters will attend selected older vessel inspections; therefore, notification as far in advance as possible is required.

Special Consideration

c. For those vessels that are not required to meet the Load Line regulations, special consideration must be given to hull structure and arrangement, freeboard, protection of openings, drainage, and the other items normally considered in the issuance of a Load Line Certificate. Since these items will not be checked by a load line "assigning authority," they must be attended to by the inspector.

3. Hull Gaugings

NVIC 7-68, "Notes on Inspection and Repair of Steel Hulls," gives guidance as to when limited or belt gauging should be required by the inspector. NVIC 7-68 further urges the inspector to witness gauging at any periodic survey and make use of the results. Additional gauging or gauging at an inspection that does not coincide with an ABS special survey should be required by the inspector when deemed necessary in order to determine the seaworthiness of a vessel. As per ABS rules, "The first Special Periodical Survey becomes due four years after the date of build. Subsequent Special Periodical Surveys are due four years after . . . the previous Special Survey." Special surveys may be deferred by ABS for up to 12 months.

4. Load Lines

Certain vessels in ocean, coastwise, or Great Lakes service are required to meet the requirements of 46 CFR, Subchapter E (Load Lines) with respect to strength, closure of openings, protection of openings, guardrails, freeing ports, means of access, etc. Inspections for compliance with these regulations are made by ABS or another assigning authority approved by the Commandant. A current Load Line Certificate shall normally be accepted by the surveyor or inspector as evidence that the vessel meets the requirements of Subchapter E. However, the weathertightness of cargo and other hatchways covered under the Load Line regulations should be examined by the marine inspectors during routine vessel inspections. When it becomes known to the surveyor or inspector that a vessel holding a current Load Line Certificate does not comply with the regulations, or that the condition of any fitting covered by such regulations is not satisfactory, the OCMI shall be informed. It is stressed that load line assignments are made by an assigning authority, while the enforcement of load line requirements rests with the Coast Guard.

a. Weathertight and Watertight. Regulations concerning weathertight and watertight standards are found in 46 CFR Parts 42.09-25(b), 42.09-40, 42.15-15, 42.15-25, and 42.15-30. See also paragraph 6.F.5 below.

b. Master's Responsibility. Regulations also task the vessel's master with the responsibility of ensuring that all exposed cargo hatches are properly secured prior to leaving protected waters. See 46 CFR 78.17-35, 97.15-20, and 196.15-20.

5. Watertight and Weathertight Inspections

At inspections for certification, the adequacy of watertight and weathertight fittings and closures will be determined. An operational test of hatch covers will normally be witnessed and tightness of hatch covers verified. If practicable, such tests should be performed at the same time that the load line assigning authority is performing an annual or periodic load line survey. At periodic reinspections, watertight and weathertight closures and fittings shall be examined to the extent necessary to ensure that they are being properly maintained. The following additional guidance and standards apply to watertight and weathertight inspections:

Watertight

a. Watertight closures such as cargo ports, and other similar openings in the sides of vessels below the freeboard deck shall be designed to ensure the same watertightness and structural integrity commensurate with the surrounding shell plating (46 CFR 42.15-55). The small passenger vessel regulations[3] previously defined watertight as to effectively resist the passage of water when subjected to a hose test of 30 psi. Gaskets shall be clean (unpainted) and flexible to provide a tight seal. Coamings and knife-edges should be structurally sound, straight and true.

[3] **NOTE:** For T Vessels, see 46 CFR 179.310, and for K Vessels, see 46 CFR 116.1160.

Weathertight

b. Weathertight means that in any sea condition, water will not penetrate into the vessel in any appreciable amount (46 CFR 42.13-20). Hatchcovers closed by portable covers must be secured weathertight as required in 46 CFR 42.15-25. Weathertight fittings for small passenger vessels[4] shall be so constructed as to effectively resist the passage of water to appreciable degree under continuous exposure to driving rain or spray. Vents, cowlings, coamings, etc., should be sound, properly fitted, and secured to prevent flooding from boarding seas.

[4] **NOTE:** For T Vessels, see 46 CFR 175.400, and for K Vessels, see 46 CFR 114.400.

Vessels of Unique Design

c. Special emphasis on weather deck openings should be placed on vessels of unique design. Even a small amount of flooding can appreciably affect stability on MODU's, hovercraft, pontoon hulls, etc. The OCEAN RANGER casualty emphasized the need to prevent and detect flooding in unmanned spaces when the chain locker flooded from boarding seas. Chain locker covers serve to reduce the amount of downflooding through the spill pipe or "spurling gate" and can be made more weathertight by stuffing rags, cement, or gasket material around the chain prior to heavy weather.

Securing Devices

d. Hinges, locking mechanisms, retaining brackets, dogs, and other securing devices should be sound and operate freely. Covers must be readily available and easily secured for closing in the event of fire as well as heavy weather.

Repairs/Strength

e. All closures and securing devices must be able to withstand the forces of boarding seas. Repairs must maintain the structural integrity of the closure. Inspectors should not allow the use of plastic putty, e.g., "red hand," to repair strength members of cargo hatch covers. NVIC 7-68 shall be used as guidance for the repair of steel hatch covers.

Testing of closures

f. Testing of closures may be done visually by light testing, pressure testing, or hose testing. Watertight closures or fittings should be tested under the design pressure where practicable. Otherwise, a hose test over 30 psi may be accepted. Weathertight fittings should be hose tested for several minutes and allow no more than a slight seepage of water to pass. An operational test shall be performed on hatch cover closure devices.

Freeing Ports

g. When conducting a compliance exam boarding of a fishing vessel or inspecting a charter fishing boat, inspectors should examine the freeing ports to ensure they are clear, and if fitted with “flapper” closures, that they are operable and will allow water on the deck to clear over the side. The charter fishing vessel Cougar is an example of a vessel floundering and sinking due to an accumulation of water on the aft deck due to inoperable freeing ports.

Hatches – Watertight Integrity

h. Manhole covers installed in watertight double bottoms on small passenger vessels shall be inspected to ensure they meet a suitable watertight reliability performance standard. Inspectors should examine all hatch covers to ensure that the gasketing material is in place and that it provides the designed watertight integrity, and that the hinges and securing devices are operable. This includes all watertight doors, hatch covers, and manhole covers to all integral hull tanks (voids, ballast, etc.), especially the o-rings on the single bolt tank covers. A failed tank cover was identified as a problem in the grounding of the small passenger vessel Yorktown Clipper when the void tank cover o-ring failed causing flooding of the accommodation spaces.

6. Bulkhead Penetrations

The use of epoxy resin as a pipe seal in watertight bulkheads is considered satisfactory when the maximum piping temperature does not exceed 200F and structural fire protection qualities are not required by the regulations. Its use should be limited accordingly, in the case of passenger vessels, to vessels of less than 100 GT. It would appear possible to design this type of seal so as to provide adequate fire protection properties. However, acceptance for compliance with the requirements of 46 CFR 72 would be subject to passing the appropriate standard fire test satisfactorily.

F. MACHINERY INSPECTIONS

1. General

At each subsequent inspection for certification, the inspector shall examine the machinery as required by law and regulations. Inspections and tests shall be performed to ensure that main and auxiliary machinery, boilers and their appurtenances, and other equipment are in satisfactory operating condition and suitable for the intended service. The chief engineer or officer in charge of the machinery shall be asked about possible defects or imperfections in the equipment, boilers, and machinery of the vessel.

2. References

Subchapter F and the Electrical Engineering regulations (Subchapter J) contain the primary standards for the inspection of main and auxiliary machinery installations on all vessels except small passenger vessels (inspected under 46 CFR, Subchapter T). As indicated in 46 CFR 58.01-5, these standards are supplemented by the standards of ABS. Subchapter F regulations apply to "T-Boats" only insofar as they are made applicable by 46 CFR 182. As provided in 46 CFR 167.25, boilers and pressure vessels and their piping and appurtenances on public nautical school ships shall conform to the requirements of Subchapter F, or to U.S. Navy or Coast Guard Standard Construction Specifications.

3. Vessels that are Not Classed

When practicable, on vessels that are not classed by a recognized classification society, the inspector shall require and observe an operational test on all main and auxiliary machinery to determine that its condition is satisfactory. The inspector may require an operational test of any machinery when necessary to determine its condition. Safety requirements shall be kept foremost in mind in the inspection of engineering equipment. The requirements of 46 CFR, Subchapter F (Marine Engineering) and the instructions in this manual are not intended to cover all contingencies that may be encountered during the inspection for certification. The inspector may require any reasonable tests or inspections deemed necessary to ensure the safety of the vessel. It is incumbent upon the inspector to be alert to unsafe conditions and to require corrective measures before these conditions can cause casualties.

4. Inspection of Main Propulsion Machinery

General

a. The inspector shall be generally guided by section 6.F above in the inspection of main propulsion machinery for certification.

Overspeed and Low Oil Pressure Trips

b. Automatic speed controls for propulsion prime movers of turbo-electric, diesel-electric, or clutched diesel propulsion systems shall be tested periodically. Tests of the operation of overspeed and low oil pressure trips, and the alarm signals of these controls on turbo-electric, diesel-electric, or clutched diesel drive vessels[1] shall be witnessed by a marine inspector.

[1]**NOTE:** Any operational tests of lube oil shutdown controls should not risk shutting off the oil supply to the bearings. Additionally, overspeeding geared turbines and direct drive diesels is considered impractical and unnecessary, and should not be required under normal circumstances. Tests of the overspeed safety devices should be as per the approved automation procedures.

3.Main Engine Gravity-Type Lubricating Systems

c. In a reported casualty aboard an C3-S-A2 cargo vessel, the propulsion turbines sustained extensive damage due to insufficient lubricating oil. Investigation revealed that a closed or partially closed valve in the piping system from the gravity tanks to the main engine caused a reduced flow of oil to the turbines. This valve was marked "L.O. GRAVITY TANKS TO GEARBOX" and was located approximately 4.57 m (15 ft) from the starboard gravity oil tank. The valve was not included in the original approved plans of the piping system and, since it was in addition to the shutoff valves at the tanks, there was no justification for its being in the system. Because a similar condition may exist on other vessels, the following action shall be taken:

(1) During the inspection or reinspection of vessels having gravity-type lubrication, the discharge piping from the gravity tanks shall be examined; and

(2) If shutoff valves are found in addition to those at the gravity tanks and unnecessary to the system, they shall be secured in the open position or removed.

G. INSPECTION AND HYDROSTATIC TESTS OF BOILERS

Taken from: **TABLE 61.05-10—INSPECTION INTERVALS FOR BOILERS**[1,2,3]

	Firetube Boilers ≥ 150 PSI	Watertube Boilers	Any Firetube Boiler for Propulsion	Firetube Boilers ≤ 150 PSI
Hydro Test:	2.5	2.5	1	2.5
• Passenger Vessel	2.5	5	1	5
• Other Vessel	1	2.5	1	2.5
Fireside Inspection	1	2.5	1	2.5
Waterside Inspection	1	COI	1	1
Boiler Safety-Valve Test	5	5	5	5
Valves Inspection	10	10	10	10
Studes and Bolts Inspection	10	10	10	10
Steam Guage Test	COI	COI	COI	COI
Fusilbe Plug Inspection	2.5	----------	COI	2.5

1 All intervals are in years; where COI is used, the intervals coincide with the applicable vessel's inspection for certification.

2 Where the 2.5-year interval is indicated: two tests or inspections must occur within any five-year period, and no more than three years may elapse between any test or inspection and its immediate predecessor.

Intervals for hybrid boilers are the same as for firetube boilers.

1. General

Marine boilers have historically been classed into two general types: firetube (or "tank") boilers and watertube boilers. A new type of marine boiler, called a hybrid boiler, has recently been approved for auxiliary steam use aboard U.S.-flag vessels. The American Society of Mechanical Engineers (ASME) Manufacturers' Data Report forms must be made available to the Coast Guard marine inspector for review at the time of any boiler installation, per 46 CFR 52.01-145. The marine inspector will inspect each boiler after installation and review the Data Report forms to ensure the boiler complies with Coast Guard regulations. See 46 CFR 52.01-135 and 53.10.

Firetube Boilers

a. The most common firetube boiler is that of the familiar "Scotch" type, still in use on Great Lakes and river vessels, and on harbor tugs in some areas. Firetube boilers are usually found on pile-driving barges, steam dredges, OCS platforms, and older vessels propelled by reciprocating engines with very simple boiler feed systems; some are coal-fired. Feed water control is primitive at best and, generally, no provision is made for keeping dissolved oxygen out of the boiler water.

Watertube Boilers

b. These are designed for operation under considerably greater stresses than are those of the firetube type. Tube metal temperatures are higher, and scale deposits that can be tolerated in firetube boilers operated at lower pressures are unacceptable. For these reasons, only distilled water can be used for boiler feed and close regulation of the feed water chemistry is essential to prevent pitting of the boiler metal and to reduce scale deposits to a minimum. In contrast to firetube boilers, the pressure containing parts of watertube boilers are of simple design, without complicated riveted seams and stayed surfaces. Frequency of repair is considerably lower and, when necessary, repairs involve such operations as tube renewals, refractory and insulation repairs and renewals, and boiler casing maintenance.

Hybrid Boilers

c. These incorporate a design feature which combines the concepts of both firetube and watertube boilers. The concept makes efficient use of space and consumes less fuel than a traditional firetube boiler. They usually burn number 6 fuel oil, but can also burn a variety of other fuels, including heavy oils, sludge, and solid waste with a few additional pieces of equipment. Current designs average about 1.53 m (5 ft) in outside diameter, 3.66 m (12 ft) in height, and consist of upper and lower chambers connected by a tube nest. Certain designs have incorporated engine exhaust gas firing along with in-port oil firing, thus eliminating the need for a ship's exhaust gas economizer. The burner and register unit is mounted at the boiler front on the lower chamber and is exactly the same type of unit that would be found on a traditional firetube boiler. Standard appurtenances such as safety valves, water glasses, feed and stop valves, steam gauges, and blow-off valves are also incorporated in present design features. Current furnace designs consist of horizontal cylindrical or vertical torispherical type configurations. Horizontal types are connected to the boiler shell by full penetration welds. The vertical furnaces are attached to the shell by an "ogee ring" which can either be integral to the furnace or be an external support flange. The ogee ring must be joined to the furnace by a full penetration weld. The connection of the ogee ring to the boiler shell must either be a full penetration weld if an external support flange, or a fillet weld if an integral type ogee ring. The integral type ogee ring must meet ASME Section I PFT 20.5. Depending upon size, the furnace may be supported by a number of stays that extend from the furnace to the boiler shell. The number of stays used for support depends on the furnace size and the maximum allowable working pressure (MAWP) of the boiler. In some cases, stiffening rings are used to add support to the furnace in lieu of stays. At the apex of the furnace, an exhaust pipe extends from the furnace into the lower boiler tube sheet. This pipe passes the exhaust gas over the steam generating tubes before the gas exits through the flue. Steam generating tubes connect the lower tube sheet to the upper tube sheet. There may also be downcomer tubes installed in the tube nest between the two tube sheets. Within the tube bundle are several stay tubes whose function is to add support to the tube sheets. Above the upper tube sheet, in the upper chamber, is the steam-generating area. The dry pipe is located near the center of the upper head. Future designs may incorporate variations on this basic theme.

2. Examination and Testing of Firetube Boilers

Test and Examination Intervals

a. Test and Examination Intervals. Title 46, Code of Federal Regulations (CFR), Subpart F, requires that hydrostatic tests must be applied to propulsion firetube boilers annually. No extension of this requirement is authorized. However, Officers in Charge, Marine Inspection (OCMIs) are permitted to extend the hydrostatic testing interval for non-propulsion firetube boilers, of not more than 10.55 kg/cm2 (150 psi) maximum allowable working pressure (MAWP) on vessels other than passenger vessels, to a period not to exceed five years (60 months) since the last hydrostatic test. OCMIs are authorized to extend the hydrostatic testing interval for non-propulsion firetube boilers of not more than 10.55 kg/cm2 (150 psi) MAWP on passenger vessels to an interval of not more than three years (36 months) since the last hydrostatic test, provided that not less than two hydrostatic tests are conducted within any five year period. OCMIs may extend the hydrostatic test interval for non-propulsion firetube boilers of 10.55 kg/cm2 (150 psi) MAWP or greater on any type of vessel to an interval not to exceed three years (36 months) since the last test, provided that not less than two hydrostatic tests are conducted within any five year period. OCMIs may authorize fireside and waterside examinations of firetube boilers of less than 10.55 kg/cm2 (150 psi) MAWP to be conducted at an interval not to exceed three years (36 months) since the last examination, provided that not less than two such examinations are conducted within any five year period. It is anticipated that the aforestated authorizations shall be exercised primarily to permit the test and examination interval to coincide with the vessel's drydocking or similar out of service availability period.

➔ **SEE** 46 CFR, TABLE 61.05-10—INSPECTION INTERVALS FOR BOILERS at beginning of Section G for intervals.

Hydrostatic Tests

b. The hydrostatic pressure should be maintained at 1.5 times the maximum allowable working pressure (MAWP) throughout the inspection of the fireside. When repairs are necessary, the methods employed, materials, and workmanship shall comply with the requirements of 46 CFR, Part 59. These boilers are particularly vulnerable to thinning of the plating, tubes, and staybolts by corrosion. This is often seen in the form of pitting, attributed to dissolved oxygen or the use of corrosive boiler water. In Scotch-type boilers, pitting is commonly found on the outside of the tubes and the shell and head plating near the waterline, the combustion chamber top plating, the furnaces, and the bottom shell plating. The numerous highly stressed riveted joints in firetube boilers are prone to attack by stress corrosion cracking, generally resulting from the deposit of corrosive solids contained in the boiler water.

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Interior Examination

c. The interior of the furnaces and combustion chambers should be examined first. Furnaces and flues should be checked for distortion by measuring with a tram bar. When corrugated or plain furnaces or flues are distorted and no longer in true circular shape, they shall be repaired as required by 46 CFR 59.15-1(a) or the boiler pressure shall be reduced as required by 46 CFR 59.15-1(c). Combustion chamber wrapper plates and back plates should be hammer tested, and areas suspected of being thin should be drilled and gauged. Broken combustion chamber stays will generally be indicated by leakage from the drilled telltale holes. The combustion chamber back plate should be checked for evidence of bulging plating between the staybolts. Riveted wrapper plate seams and the furnace connection to the combustion chamber should be checked for leakage. The back tube plate should be carefully examined since leakage in this area, which cannot be corrected by rolling tubes, is sometimes due to cracks in the ligaments between tube holes.

Tube Sheet Examination

d. The front tube sheet should be examined next. This is an area particularly susceptible to corrosion from leaking tubes, and to erosion caused by the use of saturated steam for soot blowing. Leaking tubes should be made tight by rolling, or should be replaced.

Exterior Examination

e. The exterior of the boiler shell and heads should be examined next. All lagging of the shell and heads is not normally taken off during annual inspections; however, all portable sections should be removed while the hydrostatic pressure is maintained. Wherever moisture appears, sufficient lagging should be removed to determine its source, whether leaking seams, broken staybolts, or defective boiler mounting gaskets. The plating in way of the boiler mountings should be examined for evidence of wastage due to leaks from valves and fittings. Leakage from the bottom of the front and back heads in way of the flanging of the plate should be noted for further examination of the inside of the head; cracks induced by flexing of the head sometimes penetrate the plating. Riveted seams showing evidence of leakage should be carefully examined; cracks occasionally occur between rivet holes or extend from rivet holes to the plate edge. The manhole gasket seats and adjacent plating should be checked for signs of wastage due to gasket leaks; the radial clearance between the manhole plate and the head

should not be excessive. The boiler saddles, foundations, and collision chocks should be hammer tested to detect evidence of deterioration; these members are subject to severe wastage from the corrosive action of bilge water. The hydrostatic pressure should then be released and the boiler drained out.

Examination of the Boiler Waterside

f. The inspection of the waterside of the boiler is most conveniently begun by entering through the top manhole. The dry pipe, internal feed lines, and surface blow pipe should be examined first; defective gaskets at the point of attachment of the internal feed lines to the boiler head are frequently the source of erosion of the plating. The butt strap and the rivets attaching the heads to the shell should be sounded with a hammer. Where rivets are found to be loose or rivet heads missing, the rivet holes should be searched for cracks by nondestructive testing methods after the rivets are removed. The stay rods, girder stays, and combustion chamber tops should be examined for evidence of wastage due to corrosion. The screw stays at the back and sides of the combustion chambers are difficult to examine because of close clearances. However, a good evaluation of the condition of these members can be made with the use of a portable electric light lowered successively between the rows of stays. The most common deficiency found in these stays is "necking," a reduction in diameter near the plate surface caused by corrosion and stresses from expansion of the combustion chamber. The boiler tubes are so closely spaced that visual inspection must usually be confined to the top and side rows. Pitting is frequently seen in these tubes. Shallow, widely scattered pits can usually be disregarded, but deep pits extending over a large area may so reduce the wall thickness that replacement of tubes is necessary (from the standpoint of stress, tubes will satisfactorily function with a reduction of wall thickness of up to 50 percent). In any event, when evaluating the condition of boiler tubes, a distinction must be made between plain tubes and stay tubes, the latter having a much greater initial wall thickness.

Completing the Boiler Examination

g. Finally, the lower part of the boiler interior is inspected. The most common defects in this area are corrosion of the plating of combustion chambers, furnaces, shell, and heads by pitting, and grooving of the flanged plating of the heads and furnaces. Pitting often attacks the plating of the furnaces, combustion chamber wrapper plates, back plates, and the bottom plating of the boiler shell. Grooving due to thermal stresses is frequently seen in the flanges of the front and back heads, and at the connections of the furnaces to the combustion chambers. Radial grooving, originating in the holes drilled in the front and back heads for the stay rods and extending in a "spider web" from these holes, is occasionally encountered.

3. Inspection of Watertube Boilers

Test and Examination Intervals

a. Title 46, CFR, Subpart F, requires that hydrostatic tests must be applied to all watertube boilers quadrenially (annually in the case of passenger vessels). Excepting passenger vessels, OCMIs are authorized to extend the hydrostatic testing interval for one year (12 months), to a period not to exceed five years (60 months) since the last hydrostatic test. In the case of passenger vessels, the hydrostatic test interval may be extended up to a period not to exceed 30 months since the last test, provided that no less than two hydrostatic tests are conducted within any five year period. OCMIs may extend fireside and waterside examination intervals for watertube boilers, including economizers, auxiliary boilers, low pressure heating boilers, and unfired steam boilers to an period not to exceed 30 months since the last examination, provided that no less than two such examinations are conducted in any five year period. It is anticipated that the aforestated authorizations shall be exercised primarily to permit the test and examination interval to coincide with the vessel's drydocking or similar out of service availability period. Hydrostatic pressure tests are applied annually to passenger vessel boilers, and at 5-year intervals to the boilers of other vessels. Following repairs and at the conclusion of inspections, watertube boilers should always be hydrostatically tested to a minimum of 1.25 MAWP (if substantial modifications or repairs have been made, to 1.5 MAWP).

➔ **SEE** 46 CFR, TABLE 61.05-10—INSPECTION INTERVALS FOR BOILERS at beginning of Section G for intervals.

Interior Examinations

b. The inspection is most conveniently begun inside the furnace. The waterwall tubes and screen tubes should be examined with the aid of a spotlight for evidence of blistering or distortion. Severely blistered tubes should be renewed. A minor amount of tube distortion is acceptable if the insides of the tubes are clean. If there is evidence of tube leakage at the ends of the waterwall tubes, sufficient refractory should be removed to expose the waterwall headers so that the leakage can be traced to its source. The superheater and part of its support structure can generally be seen from inside the furnace. In this area, burned support brackets and badly warped superheater elements are common defects. The baffles above and below the superheater in D-type boilers should be examined. Some boilers of this type are fitted with feeder tubes in the furnace floor, which can be examined only when the brickwork is removed. Defects in these tubes, however, are rarely encountered; the furnace floor should be disturbed only when leakage is suspected or for refractory repairs. Furnace refractory is subject to damage from erosion due to direct flame impingement, fusion occurring at high rates

of combustion, and destruction of insulation due to improper drainage during water-washing operations. When the damage is local, the defective area may be repaired; however, it is sometimes necessary to rebuild the walls or floor.

c. Exterior Examinations

Exterior Examinations

(1) General. The inspector should continue with an exterior examination. The tubes and headers of economizers and gas air heaters are vulnerable to external corrosion due to condensation and should be examined through the access openings. The steam drum and its accessories should be carefully checked; if a hydrostatic pressure test is applied, the nozzles, gaskets, and welded pipe connections should be searched for leakage. In D-type boilers, the sliding feet that permit linear expansion of the water drum should be examined. Expansion of the generating tubes of straight tube boilers is accommodated by bolting the front headers rigidly and securing the back headers with loosely fitted bolts; the condition of these bolts should be checked. In sectional header boilers, the riser tubes, drum nipples, and top row of generating tubes can be reached for examination from the access opening below the steam drum. Removal of the superheater access doors in D-type boilers will permit access to the superheater and the lower part of the steam drum. In both boiler designs, the casing in way of the steam drum should receive attention; gas leakage in this area is common. The casing below the steam drum should be examined; burning or bulging of this casing or distortion of access door frames is usually due to destruction of the insulation. If these conditions are found, the buckled casing must be removed so that the insulation can be replaced.

(2) Header Examinations in Sectional Header Boilers. The headers of sectional header boilers should be examined next. Leaking handhold plates should be marked for later removal and renewal of gaskets. The gasket surface should be examined with the aid of a mirror; chronic leakage is sometimes due to steam cuts across the seating surface. The handhold plates of superheater headers should be similarly examined, and the superheater tubes should be checked for leakage where these tubes are rolled in the headers. The short nipple connections of the transverse mud drum to the front headers and the bottom blow valve connection to this header should be checked for leakage; external corrosion of the nipples is sometimes encountered. The tube joints, handhold plates, and drain nipples of the waterwall headers should be checked for evidence of leakage and external corrosion. The air duct beneath the furnace floor should be examined to ensure that it is free from accumulation of oil.

(3) Header Examinations in D-Type Boilers. The superheater headers and waterwall headers of D-type boilers should be similarly examined. The vestibule below the economizer or air heater should be opened and cleaned. In this area, the ends of the generating tubes, at the connections to the bottom drum, can be seen. Because of the close spacing of the tubes, inspection is usually limited to the outer rows; however, external corrosion of these tubes, due to soot deposits and improper water-washing, is not uncommon. The bottom drum manhole opening, bottom blow valve connection, and drum support saddles should be examined. In this area, leakage and associated wastage are rarely seen; however, the foundations of boilers installed directly on the tank tops are subject to wastage from the corrosive action of bilge water.

(4) Examinations of the Waterside. The interior of the steam drum is the best starting point for inspection of the waterside of the boiler. The flanged piping connections of the desuperheater and internal feed lines should be hammer tested; if the tightness of the desuperheater piping is in doubt, it should be hydrostatically tested. The steam drum should be thoroughly cleaned prior to inspection; portions of the drum internal platform should be removed to permit a close examination of the drum interior and the tube ends. Pitting along the waterline, in the bottom of the drum, and in the ends of the riser tubes and generating tubes, is occasionally found. The brackets supporting the dry pipe, internal feed lines, and desuperheater should be examined to ensure that the securing bolts are tight.

(5) Examination of Tubes. A sufficient number of handhold plates should be removed from the headers of the generating tube bank, superheater, economizer, and waterwall tubes to permit a comprehensive examination of these tubes. In addition to tube inspection, handhold plates should be opened to permit inspection of header baffle plates, orifice plates, drain locators, branch lines, inlet/outlets, elbows, thermometer wells, and other locations subject to high stresses or corrosion. Generally, removal of 5 percent of the handhold plates will suffice; however, if internal pitting or an excessive amount of scale is found, it may be necessary to remove all of the handhold plates for a complete examination. Scale deposits exceeding 1/32" in thickness will seriously impair heat transfer, especially in screen tubes and waterwall tubes, and may result in blistered and distorted tubes. Scale should be removed by mechanical means or by chemical washing. Examination of tube interiors is difficult in D-type boilers because the tube bends preclude sighting more than a short

distance inside each tube. However, the tubes should be inspected from within the lower drum and, with the aid of a mirror, from the waterwall and superheater headers. The inside surface of the bottom drum should be examined for evidence of pitting; this is occasionally seen in boilers that have been out of service for long periods of time.

4. Examination of Hybrid Boilers

General

a. As a result of the design efforts to comply with size restrictions imposed by ship builders, hybrid boilers are very compact in their construction. They are considered to be auxiliary heating boilers, and their operating controls are regulated under 46 CFR 63.05 or 63.10, depending upon fuel consumption and rated heat output.

Tests

b. For test purposes, these boilers are considered to be of the firetube type and shall be hydrostatically tested at least annually, per 46 CFR 61.05-10.

Fireside and Waterside Examinations

c. The limited access available for internal examinations of these boilers presents some unique inspection problems. Methods available to perform internal examinations are few, and certain areas of these hybrid designs demand special attention by the marine inspector. The tube sheet ligaments, if accessible, should be thoroughly examined for cracks, especially near the furnace area. To the extent possible, the tube sheets should be examined for distortion or other indications of surface deterioration. Uptake/flue pipe between the top of the furnace and the lower tube sheet should be examined for possible yielding of the material caused by excessive heat either from normal firing with a low water level or extreme high firing rates for extended periods of time. The external pressure exerted on a horizontal cylindrical furnace or an uptake pipe will eventually cause the pipe to fail after being subjected to these conditions. The fireside of the furnace should be examined for brickwork damage or deterioration. All accessible waterside areas of the furnace should be examined for signs of pitting, cracks, and scale. A serious scale build-up or pitting on the furnace plate's waterside can be indicative of a poor boiler water treatment program. During the waterside exam, the furnace and shell surfaces in the vicinity of the ogee ring (and the ring itself) should be thoroughly examined. This area supports a majority of the load and is susceptible to very high stresses. If evidence of deterioration or distortion is found, nondestructive testing should be performed on the welds, which connect the ogee ring to the shell, and to the furnace. Any problem involving the ogee ring should be investigated from both the internal and external vantages, on the ring inner and outer diameters.

Stays

d. Boiler stays should be carefully examined for cracks, especially in way of the welds. Stays should be examined to detect "necking" or similar evidence of deterioration. One method to evaluate the condition of a boiler stay is to strike it with a hammer and listen carefully to the resulting sound. Generally, if the stay is in good condition, it will make a ringing sound when struck. A dull sound is indicative of a cracked or otherwise deteriorated stay and it should be thoroughly inspected for defects. Other forms of nondestructive testing, such as dye-penetrant or magnetic particle, can be used to determine a stay's condition. In case several stays in one area are found to be defective, the problem is nearly always due to uneven loading on the support structure, a condition that should receive immediate corrective action.

5. Repairs to Boilers

Introduction

a. It is difficult to describe all of the many types of repair procedures that the inspector may have to consider. Boiler defects will seldom involve only certain specific areas. Severely pitted tubes will often be accompanied by pitting in headers or in steam and water drums. Similarly, a distorted corrugated furnace frequently is evidence of wastage of combustion chamber plates or adjoining furnaces. Repairs, whenever they are undertaken, must comply with the requirements of 46 CFR 59.

Firetube Boilers

b. In firetube boilers, visual inspection of the outside of the tubes is limited to the outer rows, because of close tube spacing. Heavy scale buildup on these tubes is common, and thorough cleaning of the tubes, even by chemical means, is very difficult. In addition to pitting on the waterside, these tubes are subject to wastage of that part of the tube that projects beyond the tube sheet, particularly in the smoke box area. This condition is easily detected. When it is found, the defective tubes should be renewed. On the other hand, thinning of the tube walls due to corrosion can usually be discovered only by cutting out and sectioning tubes. This procedure should be followed only when a substantial number of the tubes are found to be leaking or plugged. In general, when tubes look satisfactory on the waterside, when the boiler has no history of tube failure, and when leakage can be corrected by rerolling, the tubes may be kept in service. Tubes from which the beading has been burned off should not be built up by welding, but shall be renewed (see Figures 6-1 through 6-3 for examples of defects and repairs to firetube boilers).

Watertube Boilers

c. In watertube boilers, tube replacement is one of the most frequently encountered repair procedures. Boiler tube life is influenced by such factors as original wall thickness, thermal stresses due to location within the boiler, waterside corrosion, fireside damage, and service history of the boiler. The external surfaces of tubes are exposed to loss of metal from corrosion by sulfur and vanadium in the oil burned, as well as overheating and slag damage. Deterioration of this type may result in abnormal bends, bulges, blisters, ruptures, and mechanical fatigue cracks that are fairly obvious during visual inspection of the firesides. The following procedures are recommended for inspection of boiler tubes:

(1) Conduct a detailed and thorough visual inspection of all uncovered tubes. In general, when tubes look satisfactory from a visual inspection, they may be kept in service until some degree of failure is encountered. When the same type of tube failure occurs often, a major tube replacement should be considered. A number of failed tubes may be plugged in an operating boiler, generally not exceeding 10 percent of the tubes in any one tube bank, section, or pass. However, this 10 percent figure is for guidance purposes only, and any recommendations for tube replacement by the manufacturer's representative should be followed. Tube location is important in determining whether they can be plugged. Superheater tube plugging should be limited to 10 percent of each pass. Renewal of tubes at less than 10 percent may be justified if the tubes in question are in a group, may cause poor gas flow, or overheating. Support tubes should be renewed. Major circulating tubes, such as downcomer or riser tubes that are defective should be replaced.

(2) If there is a suspicion that deep corrosion product scabs exist in waterside pits, or if any other condition prevents minimum thickness determination, chemical cleaning to bare metal should be required. If this process shows pits in a large number of tubes, and more than one or two in many tubes, a sample tube should be cut out of the boiler and sectioned and its minimum thickness determined.

(3) If the sample tube has deteriorated generally to less than 50 percent of the original thickness, a representative number of tubes (20-30) should be cut out of the tube bank and the process repeated. If more than half of the sample tubes are found to be in the same general condition of deterioration, consideration should be given to retubing the boiler.

FIGURE 6-1
DEFECTS AND REPAIRS TO FIRETUBE BOILERS (1)

(To be included in future revision)

FIGURE 6-2
DEFECTS AND REPAIRS TO FIRETUBE BOILERS (2)

(To be included in future revision)

FIGURE 6-3

DEFECTS AND REPAIRS TO FIRETUBE BOILERS (3)

(To be included in future revision)

6. Inspection of Boiler Mountings

Introduction

a. The regulations concerning boiler mountings in 46 CFR 52.01-3 and 61.05-15 were written when more attachments were connected directly to the steam drum or boiler shell than in today's more modern boiler which have welded mountings. However, the intent and concerns of these regulations apply to modern boilers regardless of mounting types. The inspector should recognize the importance of all connections and piping to the first isolation valve. It should not be necessary to require removal of all first isolation valves to comply with the "mounting" inspection intent. All major valves, which are the first isolation or control of steam or feedwater, should be treated as "mountings" for inspection of the valve and piping toward the boiler. At a minimum, the following valves are subject to valve and mounting inspection requirements: main steam stop; generator steam stop; auxiliary steam stop; main and auxiliary feed stop; blowdown (surface and bottom); superheater vent; superheater drain; and soot blower stop.

Inspection Criteria

b. The following inspection criteria shall be observed:

(1) Five-Year Valve Inspection. This should be adequate to ascertain the condition of the valve body, adjacent piping, and valve condition to ensure isolation of the system down from the valve. The interval for opening and examination of boiler valves may be extended by the OCMI for a period of one year (12 months) to a maximum interval of not more than five years (60 months) since the last such examination, in order to coincide with the vessel's drydock exam or similar out of service availability period.

➔ **SEE** 46 CFR, TABLE 61.05-10—INSPECTION INTERVALS FOR BOILERS at beginning of Section G for intervals.

(2) Ten-Year Mounting Survey. This includes studs that are subject to high heat and stresses. Valves should be required to be removed if internal piping and valve conditions cannot be adequately examined from inside the steam drum or other open connections. The eight year interval for boiler mounting examination (i.e., removal of boiler mountings, examination of mounting studs or bolts) may be extended by the OCMI for a period of up to two years (24 months) to a maximum interval of not more than ten years (120 months) since the last such examination, in order to coincide with the vessel's drydock exam or similar out of service availability period.

(3) Studs. Boiler mounting studs must be made in accordance with ASME Standard 193. Studs are heat treated and marked on one end with a grade and manufacturer's symbol. A common stud grade is "B7" which indicates a heat treated austenitic steel alloy for "high strength" bolting materials. Studs should be checked for proper heat number. Examination of the stud may be made in place. If the stud is removed, it should be examined for cracks, "necking" down, or deterioration. If studs are bend tested, experience and sound judgment is necessary to determine whether the studs are brittle. Even a new stud will break at the notch of a thread when bent more than 30 degrees. Therefore, bend testing is not recommended.

(4) Flanged Valves. When flanged valves are removed from the boiler pads, the condition of the studs or bolts that connect the valves to the pads shall be determined. When valves are bolted to pads or spools that are riveted or welded to the boiler, the riveted or welded joints should not be broken unless there is evidence of leakage or deterioration. These examinations may also be made at intermediate periods if there is any evidence that defects have developed or that excessive corrosion has occurred. When one or more flanged joints intervene between a stop valve and the boiler drum or superheater outlet, such flanged joints need not be opened at the time the valve is removed from its flanged joint. A flanged joint may be opened at any time by the inspector if, in his or her opinion, examination is considered necessary.

Removal of Mountings and Attachments on High-Pressure Boilers

c. The requirement to remove boiler mountings at 8-year intervals has been modified for certain vessels having unusually high steam pressures. This modification has been permitted due to the difficulty of attaining a steamtight joint and the fact that some valves are welded directly to the steam piping. For these vessels, only the bonnets of the valves need be removed to permit the inspection required at 10-year intervals. Valves, mountings, and attachments need not be removed unless defects are found that require their removal for further examination, repair, or replacement. Credit shall be given for an 8-year boiler mounting inspection for these vessels if the boiler valve bonnets are opened and the inspector is satisfied with the examination. A mirror shall be used to check all inaccessible parts of the mountings. A record of the inspection of the mountings shall be made on Form CG-840B (Boiler Inspection Book - Condition of Vessel) and a notation made on the COI. This notation shall be carried on each succeeding certificate until the next inspection.

Boiler Safety Valves

d. Boiler Safety Valves

(1) General. Testing of boiler safety valves is typically conducted at the inspection for certification. Extensions are not authorized for the testing of safety valves. In most cases, the testing of these devices can be accomplished without taking the vessel out of service. Proving satisfactory operation of boiler safety valves is now especially important given the potentially increased intervals between boiler internal examinations and hydrostatic tests. The inspector shall observe the lifting and reseating pressures of the boiler safety valves and examine the valves to determine if there are any signs of weakness or malfunctioning. Whenever evidence of leakage appears, the inspector may require the safety valves to be opened at intermediate periods for examination. The inspector shall carefully check the setting of each boiler drum and superheater safety valve and require any adjustments necessary to maintain the boiler within MAWP.

(2) Inspection of Piping. The safety valve escape piping shall be examined for freedom of expansion and proper drainage. At the time the safety valves are tested, the inspector shall also ascertain that the drain opening in the valve body and the escape piping are free. Improper drainage or plugged drains may result in serious corrosion of the valve body and internal parts. The inspector shall examine the boiler casings to ascertain that there is no accumulation of soot, ash, or scale that may drop into the escape piping and cause malfunctioning of the safety valve. The inspector may require the discharge connections to be removed to determine the freedom of discharge from the safety valves.

Cast-Iron Valves

e. See subparagraph B1.G.8.b below.

Water Columns, Test Cocks, and Gauges

f. The water columns and gauge glasses shall be carefully examined at each annual inspection. It must be ascertained that water cannot accumulate in the pipe forming the steam connection to the water column. The connections to the boiler should be free, as indicated by the action of the water in the glass. The water columns and gauge glasses shall be blown down on each boiler to determine the freedom of the connections to the boiler and to see that the blow off piping from the water columns and gauge glasses is free. The operating condition of the gauge cocks shall be determined by test. All steam gauges on the boilers and main steam lines shall be checked for accuracy with a standard test gauge.

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7. Inspection Procedures for Externally Fired Lap Seam Boilers

Before Inspections

a. Before inspection, all lagging or other material covering longitudinal lap joints shall be removed on the entire length of the seam, to a width of at least 4 inches from the nearest course of rivets, after which the seam shall be thoroughly scaled and wire brushed outside (and inside if possible). All deposits of electric welding, whether on rivets or plates, shall be entirely removed. The joints should then be thoroughly examined for indications of grooving or other defects. Grooving in the initial stages is characterized by a line of irregular surface cracks extending along the caulking edges or running parallel with the line of rivets, and is particularly noticeable on the waterside. When grooving is evident, steps should be taken to ascertain its depth and extent so that a lower working pressure may be calculated, based on the premise that the groove exceeds the maximum measurable depth by 10 percent.

During Inspections

b. During inspection, and while the boilers are under full hydrostatic stress, the exposed seams shall be shock tested over their entire length by striking the plates in the vicinity of the rivets with a smooth-headed hammer weighing at least 7 pounds. Should this procedure reveal a leak, however slight, in the solid plate, a crack is indicated. In this case, the lap seam must be cut away and butt straps installed or the shell plate renewed.

Fusion Welding

c. Fusion welding for any purpose or to any degree must not be applied or allowed to remain on rivets or solid plate forming a longitudinal lap joint. Should leaks develop as a result of slack seams or rivets, sufficient rivets shall be renewed to obtain a tightly caulked joint. Rivet removals, when necessary, should be done by chipping off the rivet points (heads) and driving out the shank, but never by burning. In every case where rivets are removed, appropriate nondestructive testing should be used to detect the presence of cracks. Seams found to be satisfactory may be relagged or otherwise covered so that the covering can be easily removed intact at subsequent inspections.

Alternative Repair Methods

d. Should a departure from these methods of repair become necessary, full details shall be transmitted to Commandant (G-MOC) for approval before alternative action is taken. A separate entry shall be made on Form CG-840B in each case, indicating that the foregoing procedures have been carried out. A statement of the conditions found and the nature and extent of repairs, if any, shall be included.

Reports of Defective Seams

e. Reports of Defective Seams. Commandant (G-MOC) shall be furnished with a detailed report, including photographs if obtainable, in each case where defective seams are detected.

8. Lessons Learned About Boiler Operation

Explosions in Firetube Boilers

a. Explosions in Firetube Boilers

(1) Facts developed during the CAPT C. MATHIASEN investigation indicated that a weakened condition of the flanged plate, forming part of the combustion chamber, escaped detection during the annual inspection. It is evident that hydrostatic and hammer tests alone are not sufficient to establish the integrity of a boiler for continued service. Defects that show up under hydrostatic tests can easily be observed from the outside or fireside of conventional boilers. Often, however, the most serious defects are indicated only by the surface condition of the plates or other parts seen from the waterside or steamside. Some of these interior defects are:

(a) Grooving, which is usually found along the edge of lapped plates;

(b) Fatigue cracking, which occurs on the knuckles of flanged plates and on the underside of the first corrugation forming the horse collar of Morison-type furnaces; and

(c) General deterioration of plates and stays caused by corrosion, which is often concealed by a thick layer of scale.

The extent to which these defects have advanced can be determined only through most careful examination after the boiler has been thoroughly scaled and cleaned.

Superheater Erosion

c. Superheater Erosion

(1) Inspection Procedures. When inspecting boilers that have superheater headers installed vertically or nearly vertically, the inspector shall use all means available to determine if there is grooving or pitting of the header in the area of the baffle. This examination shall include the use of mirrors and finger touch, as necessary. If serious pitting or erosion is found in such superheater headers, the drain holes should be relocated in the baffle near the center thereof and the original holes welded closed. Whenever pitting or erosion is noted, necessary repairs should be made to prevent a potential boiler casualty.

Cast-Iron and Malleable Iron Valves

d. Cast-Iron and Malleable Iron Valves

(1) Introduction. Failures of cast-iron boiler valves used in main and auxiliary steam feed and blow off lines installed prior to 1 July 1935 have resulted in a number of serious casualties and deaths. Because of the thinning down of the valve bodies due to corrosion and wear, with a consequent decrease in the factor of safety, cast-iron valves and fittings used in boiler mountings and in steam feed and blow off lines should be subjected to thorough examination, particularly at the time of the annual inspection. Since the brittle properties of cast iron may produce fractures under conditions of shock and sudden applications of load, such as "water hammer" and rapid changes in temperature, cast-iron valves and fittings should be carefully and thoroughly examined for cracks and corrosion defects at the time of inspection.

(2) Inspection Procedures. At the end of the 4-year period when boiler mountings are opened, and the end of the 10-year period when they are removed in accordance with 46 CFR 61.05-15, cast-iron valves and fittings should be subjected to a thorough visual inspection, both internally and externally. The valve bodies should be inspected to ascertain whether there has been a reduction in wall thickness below the requirements specified in 46 CFR 56.60-10. If the thickness of the material has fallen below the specifications, such valves and fittings should be removed from service. Special consideration should be given to installations in which cast-iron valves and fittings have been repaired or have had parts replaced or altered. The bodies of cast-iron valves and fittings should not be tapped for drainage or bypass connections, etc., except when a boss has been cast integral with the valve. Inasmuch as cast iron and Grade B malleable iron have somewhat similar properties, valves of this latter material should receive the same thorough inspection as required for cast iron.

Steam Piping to Soot Blowers

d. In a reported casualty, a 600 psi steam supply line to the soot blower elements ruptured, causing serious injuries to the person who was blowing tubes. Examination of the ruptured pipe showed that the rupture occurred in a bend where erosion had, over a period of years, virtually eaten away the pipe from the inside. Particular attention during periodic inspections shall be given to areas where erosion or corrosion are likely to occur in soot blower piping. The location of these areas can best be determined from a visual examination of the piping installations aboard the vessel.

H. INSPECTION OF AUXILIARY MACHINERY AND EQUIPMENT

The purpose of tests and examination of auxiliary equipment is the same as for main equipment. We need to ensure that it will operate safely at the design pressure, temperature and condition for a specified minimum period of time.

1. Turbine Driven and Diesel Driven Auxiliary Machinery

Overspeed trips, low-lube oil pressure trips, and low-lube oil pressure alarms of turbine or diesel driven auxiliary generators should be tested at each inspection.[3] Other turbine driven auxiliary machinery, e.g., feed pumps, fire pumps, etc., should be examined under operating conditions to ensure proper functioning of the local and remote startup and shutdown controls, as well as speed controls under various load conditions.

[3]**NOTE:** Any operational tests of lube oil shutdown controls should not risk shutting off the oil supply to the bearings.

2. Steering Gear

See Section C, Chapter 4 of this volume for guidance on inspecting the steering gear.

I. INSPECTION OF PIPING SYSTEMS

1. General Considerations

The inspector shall be generally guided by 46 CFR, Subchapter F for the inspection of piping systems and ANSI B31.1. Particular attention shall be given to material type and rating, pipe securing arrangements, couplings, and alignment. Material and equipment must be suitable for the service intended and meet melting point, ductility, strength, and compatibility requirements for the system. Piping must be well secured to reduce vibration and stresses. Couplings shall be suitable for the pressure and service. Proper alignment of piping systems should also be checked. (See MSM II B3 and C2 of this volume regarding expansion joint and dresser coupling requirements.)

2. Test and Examination Intervals

The hydrostatic test interval for firetube boilers' main steam piping shall be in accordance with the intervals permitted in paragraph H.2.a. The hydrostatic test interval for watertube boilers' main steam piping shall be in accordance with the intervals permitted in paragraph H.3.a. Hydrostatic testing of steam piping subject to main boiler pressure, other than main steam piping, may be extended one year (12 months) to an interval not to exceed five years (60 months) since the last hydrostatic test.[4]

[4]**NOTE:** Vital System Automation, see 46 CFR 61.40 and 46 CFR 62

3. Safety and Relief Valves

The inspector shall observe that the safety valves (or relief valves) installed on reduced-pressure lines, evaporators, and feedwater heaters operate satisfactorily. These valves shall be tested to determine if they can prevent the build up of excessive pressures before the shutoff valve can be closed, and if they serve as a warning in the event of failure of the reducing valve. The setting of such valves shall be checked at each inspection and adjusted if necessary.

4. Internal Bilge Suction Valves

General

a. Internal valves are required to be installed on bilge suction lines on passenger vessels by 46 CFR 56.50-50. They are not required on cargo or tank vessels, but are fitted in many instances as an additional safety measure. These valves often consist of screw-down valves that, in many instances, become frozen in the open position. In some collisions and groundings, damage to the vessels could have been greatly reduced if the proper precautions and maintenance had been taken with internal valves. Often, the initial damage was confined to one watertight compartment but because internal valves had been left open, other compartments were flooded, cargo holds were damaged, and personnel were endangered. In the course of some investigations, it was reported that no officers knew the purpose of the valves, or even that they existed. For these reasons, the inspector shall check such valves and require them to be operable, whether or not they are required under 46 CFR 5 6.50-50. The inspector shall also ensure that the ship's officers understand the purpose of these valves.

Neutralizing Valves, or Incapacitating Remotely operated valves

b. Should the operator of a cargo vessel equipped with remote control suction valves in bilge suction lines wish to remove these valves or render them permanently inoperable in the open position, the operator may do so through one of the following procedures:

(1) Removing the remote control rod, operating wheel, and suction valve and replacing the valve with a spacer of equivalent size;

(2) Removing the remote control rod, operating wheel, remote control suction valve bonnet, valve disc, body seat ring, and guide bridges and replacing the valve bonnet with a steel cover plate of appropriate size; or

(3) Removing the remote control rod, valve stem, and disc and installing a screwed plug or bolted gasket and washer over the stuffing box hole to create a tight valve bonnet.

5. Cargo and vital or critical system Piping Repairs

Repairs to cargo and vital or critical system piping systems are classified as emergency, temporary, or permanent in nature. Emergency repairs are made to permit the completion of cargo discharge. Temporary or permanent repairs shall be required prior to loading of another cargo. Temporary repairs are made to a pit or other isolated defect in a line. Temporary repair methods include the use of substantial pipe clamps, repair sleeves, and similar devices capable of withstanding operating pressures and temperatures. Permanent repairs are made by an isolated welded doubler or renewal in kind, and are required upon the next gas-freeing or repair period, whichever is sooner. Generally, piping with a localized, isolated defect and otherwise in good condition may be repaired with a doubler.

> **NOTE:** Piping restored to service by any of these methods should be appropriately tested upon completion of repairs.

6. Diesel Piping Systems

Diesel supply and service piping, including that provided by engine manufacturers, should be carefully inspected. Several fires have resulted from the cracking of diesel supply lines and injector couplings due to vibration. All fuel systems should be checked for proper mounting, expansion joints, filter arrangements and spray shields.

J. ELECTRICAL INSPECTIONS

1. Introduction

At each inspection for certification, the inspector shall examine the vessel's electrical equipment and apparatus, the arrangement and materials of the installation, and the operating condition of the installation as required by the regulations. The primary purposes of electrical inspections are to ensure the adequacy and reliability of shipboard electrical systems, to maximize safety to personnel from electrical shock, and to minimize the danger of fire originating within the electrical system.

2. Scope of Inspection

The scope of the electrical inspection for small passenger vessels is detailed in 46 CFR 176.25-15; for other vessels in 46 CFR 110.30. The inspection includes the examination and testing, when necessary, of all electric generators, motors, wiring circuits, junction boxes, fixtures, and other electric installations. No electrical repairs or alterations affecting the safety of the vessel, its equipment, and crew shall be made without the knowledge and approval of the OCMI. Drawings must be approved before work is started when the repairs will involve alterations (See Section A, Chapter 4 of this volume concerning the inspection of electrical equipment used on vessels).

3. References

The standards for the inspection of electrical installations on all vessels except small passenger vessels are contained in 46 CFR, Subchapter J. As indicated in 46 CFR 110.10, they are supplemented by recognized specifications, standards, and codes. Subchapter J applies to small passenger vessels only insofar as they are made applicable by 46 CFR 183. Vessels contracted for prior to November 19, 1952, are not fully subject to the requirements in Subchapter J. The electrical installations on these older vessels may be maintained as long as their condition is satisfactory to the OCMI, unless amended regulations specifically apply to these vessels. However, major alterations or extensions to such electrical installations shall be made to the requirements of Subchapter J. Additional references can be found in the Institute of Electrical and Electronic Engineering (IEEE), American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), National Electric Code (NEC), International Electrotechnical Commission (IEC), the old 46 CFR Subchapter J (pre-June 1996 editions), NVIC 2-89 *Guide for Electrical Installations on Merchant Vessels and MODUs*, NVIC 9-84 *Electrical Installations in Agricultural Dust Locations,* and Underwriters Laboratory Inc. (UL) Publications.

4. Initial Electrical Inspections

Introduction

a. In carrying out tests and inspections prescribed in 46 CFR 110.30, the inspector shall pay particular attention to the items listed below. These tests and inspections are intended as guides to the inspector; they are not mandatory unless the OCMI judges them to be necessary. Extreme caution shall be exercised during all inspections and tests. They will be conducted by the shipbuilder, the owner, or the owner's representative. They should be observed by an inspector, and the recorded data obtained for checking and reference purposes. For more detailed plan approval information, see Marine Safety Manual Volume IV.

Electrical Cable

b. Electrical cable shall be checked during installation for size and type as shown on the approved plans. The adequacy of cable supports shall also be checked. It shall be ascertained that cables are not located near pipes and hot objects, and that they have not been damaged during installation by excessive pulling, sharp bends, sharp or rough edges of cable supports or bulkhead penetrations, or similar conditions. Cable penetrations required to be watertight shall be checked for proper packing of terminal or stuffing tubes, including areas provided for future take-up of gland units. Cable penetrations through Class A and Class B bulkheads and decks shall be checked for compliance with approved methods.

Insulation Resistance

c. All electric power and lighting cables, generators, and vital systems motors shall be checked for proper insulation to ground and between conductors. The insulation resistance measuring instrument (megger) used should be of the 500 volt, direct-current type, except for equipment where the normal operating voltage is less than 100 volts in which case a direct reading ohmmeter of the appropriate voltage should be used. Insulation resistance varies considerably with humidity, amount of exposed copper, etc. Therefore, it is difficult to establish firm rules to guide the inspector. Generally, Figure B1-4 should be used as a guide in determining minimum acceptable values of insulation resistance. Ordinarily, on a dry day and with new, clean equipment, resistance should not be less than the values indicated in the figure. The insulation resistance in megohms shall be at least equal to that determined by the formula in Figure 6-4.

Group Control Panels

d. When two or more motor controllers are grouped into a central panel and supplied by a common feeder, the panel shall be checked for compliance with the requirements of 46 CFR 111.70. Each controller, its associated motor overcurrent protective device, its motor branch circuit overcurrent protective device, and disconnecting mechanism shall be mounted in a common enclosure with a disconnect device that prevents the door being opened when the circuit is energized. The enclosure shall be either drip-proof or watertight, depending on its location. Adequate working space should also be provided. This generally should be no less than 76 cm (30 in) in front,

FIGURE B1-4
INSULATION RESISTANCE

1. GENERAL INSULATION RESISTANCE FORMULA FOR VITAL MOTORS AND GENERATORS

$$R \text{ (In Megohms)} = \frac{E}{\frac{KVA + 1{,}000}{100}}$$

Where: E = Rated line to line voltage of the machine.

KVA = Rated kilovolt amperes.

2. GENERAL RESISTANCE TABLE FOR CABLE1

MINIMUM CIRCUIT	INSULATION RESISTANCE
0 – 5 amperes, inclusive	2.0 megohms
6 – 10 amperes, inclusive	1.0 megohms
11 – 25 amperes, inclusive	400,000 ohms
26 – 50 amperes, inclusive	250,000 ohms
51 – 100 amperes, inclusive	100,000 ohms
101 – 200 amperes, inclusive	50,000 ohms
Over 200 amperes	25,000 ohms

1. The values for a circuit should be determined with the circuit de-energized, with all switches or circuit breakers connected in the circuit closed, and with all panelboards, controllers, fuses, and fuseholders in place. and in no case less than 18 inches in the rear, when access to the rear may be necessary.

Generators

e. Generators shall be checked for general condition (both electrical and mechanical), voltage regulation, parallel operation, operation of safety devices such as reverse-current or reverse-power trips, overcurrent trips, overspeed trips, low-oil pressure trips, and similar devices (see 46 CFR 111.12).

Rotating Electric Machinery

f. This equipment shall be checked to ensure that rotating and uninsulated electric parts are adequately shielded from accidental contact by personnel. Nameplate data shall be examined for correct ratings for the particular application (see 46 CFR 111.01 and 111.25).

Switchboards

g. Switchboards shall be checked for nonconducting handrails, guardrails, working spaces, insulating floor coverings, drip covers, and shields. Switchboard enclosures shall be checked for proper construction in accordance with 46 CFR 111.30. Switchboard mounted apparatus shall be checked for identifying nameplates. Circuit nameplates shall be compared with the rating or setting of the overcurrent devices and with approved plans. The accessibility of items requiring maintenance or adjustment shall be checked. Meters shall be checked for proper operation. The operation of automatic switchgear and interlocks shall be observed (see 46 CFR 111.30).

Panelboards

h. The rating or setting of the overcurrent devices shall be compared with the values given on the circuit directory and the approved plans. The accuracy of the directory description of loads served by each circuit shall also be checked (see 46 CFR 111.40).

Motor Starters

i. Motor starters shall be checked to ensure proper starting under service conditions with properly rated motor overload protective devices. Enclosures shall be checked to ensure that they are dripproof or watertight, and that required door positioners are installed on doors with a height of more than 45 inches or a width greater than 24 inches. A fixed heat-resistant wiring diagram for each motor starter must be on the inside of its enclosure door. Each motor starter not disconnected from all sources of potential when the disconnect switch is opened, due to electrically interlocked circuits that are necessary for proper operation of the apparatus or for other valid reasons, shall have attention directed to these conditions by a warning sign (see 46 CFR 111.70).

Disconnect Switches

j. The presence and location of disconnect switches required for motor starters, fuses, etc., shall be checked. When a switch or circuit breaker is intended to serve as a motor and controller disconnect switch, the inspector shall ensure that the applicable requirements have been met (see 46 CFR 111.55 and 111.70 and National Electrical Code Article 430, Part H).

Accessibility

k. The accessibility of electrical apparatus for inspection and maintenance shall be observed. The accessibility of junction boxes and similar apparatus in way of paneling shall also be noted. Hinged doors of motor starters and similar apparatus shall be checked for interference with adjacent structural parts or apparatus.

General Alarm Systems

l. The general alarm system shall be checked with a sound level meter, the sound level of the bells being measured in each stateroom with the doors closed. Where the background noise level is questionable, the sound level should be measured while the vessel is underway (see 46 CFR 113.25-9).

Electric Installations in Hazardous Locations

m. During the initial inspection for certification, the emergency loudspeaker system shall be checked with a sound level meter at each lifeboat handling station, each lifeboat embarkation station, each passenger assembly station, and throughout the crew's quarters. Where the background noise level is questionable, the sound level should be measured while the vessel is underway (see 46 CFR Table 113.50 for the required sound levels).

Emergency Loudspeaker Systems

n. Electric equipment and wiring in hazardous locations shall be checked for compliance with 46 CFR 111.105. Intrinsically safe systems shall be checked to ensure that they are installed in accordance with the plans and instructions required by 46 CFR 111.105-11. Equipment required to be explosion-proof or intrinsically safe shall also be checked for proper Underwriters Laboratories, Inc. (UL), Factory Mutual Research Corporation (FM), Canadian Standards Association (CSA), or MET Electrical Testing Company (MET) labels.

Steering Gear Circuits

o. Steering gear circuits shall be separated to meet the requirements of 46 CFR 111.93. Steering gear motor controllers shall be located in the steering gear room (see chapter 14 of this volume).

Emergency Firepump Circuits

p. Circuits for emergency firepumps shall not pass through the engine room or boiler room.

Low Voltage Release Tests

q. It shall be determined that motor controllers required by 46 CFR 111.70-3(f) and (g) to have low voltage release, do so, and that motor controllers prohibited from having low voltage release have low voltage protection. All motors should be run simultaneously and all generators then tripped off the line. One generator should be placed back on the line; it should not trip because of the oncoming load. Motor controllers requiring low voltage release should start their motors automatically; those prohibited from having low voltage release should not start their motors automatically. If the motor load exceeds the total ship's service generating capacity, this test should be conducted with all motors that have low voltage release and sufficient motors with low voltage protection, adding up to the total generating capacity running. A second test shall then be conducted with the remaining motors; none of the motors in this second test should start automatically.

Equipment—

Miscellaneous Electrical

r. The Coast Guard no longer grants type approvals for miscellaneous electrical equipment. Electrical equipment can basically be divided into the following categories:

Required to be Approved

(1) This equipment is listed in Subchapter Q and will have an approval number assigned.

Required to Meet Various Standards

(2) This equipment is discussed in Subchapter J. It is important to note that the requirement is to meet the standard, not to be listed by a listing service. The burden of proof that the standard is met rests with the manufacturer.

Having Specific Requirements in Subchapter J

(3) The index following Subchapter J may be used to identify if certain equipment must satisfy additional 46 CFR requirements.

Required to be Explosion-proof or Intrinsically Safe

(4) This equipment must be listed by UL, FM, MET, or CSA.

NOTE: Some equipment approvals may require combination of the above factors.

5. Subsequent Electrical Inspections

Introduction

a. In subsequent tests and inspections, inspectors shall pay particular attention to the items listed in this section of the manual. The inspector shall determine mechanical and electrical conditions, performance, safety of personnel against shock hazards, and safety of the vessel from fire hazards.

New and Modified Circuits

b. Circuits and equipment added or modified since the last inspection shall be given special attention to determine that they comply with the regulations.

Navigation Lights

c. Navigation lights shall be examined for corrosion of materials and for satisfactory condition of portable cable and receptacles. Navigation light panels shall be tested for satisfactory operation and proper functioning of alarms.

Lifeboat Winch Electrical Equipment

d. All enclosures for electrical lifeboat winch control equipment, such as limit switches, master switches, and emergency disconnect switches, shall be opened and examined for evidence of water or corrosion. In particular, attention shall be given to the proper functioning of limit switches and emergency disconnect switches in the control circuits of lifeboat winches. Casualty investigations have indicated the need to specifically examine the clutch interlock switches on dual winches, such as those on Victory-type cargo ships. It is essential that satisfactory limit switches and emergency disconnect switches be used with gravity davits and power-operated winches. Therefore, a test operation of the lifeboat winch controls, including limit switches, emergency disconnects, and clutch interlocks where employed, shall be conducted at each reinspection and as the inspector may require.

Watertight Doors

e. The inspector shall thoroughly check the watertight door systems to verify that they are in satisfactory operating condition. The enclosures for all local control door switches and controllers should be examined for evidence of water or corrosion. It has been found that faulty operation of electrically operated watertight doors may be caused by seawater entering the local control switch located at the watertight door. If seawater has entered the switch enclosure, it may short circuit the motor starter and motor so that the door opens even with the wheelhouse control indicating the "closed" position. To the extent practical, the inspector shall also be satisfied that the ship's personnel are familiar with the watertight door system, location of disconnect switches, etc.

Electrical Cables

f. The condition of cables should be determined by insulation resistance readings (see subparagraph 6.L.4.c above) and by visual observations. Deterioration of the armor of a cable that is otherwise in good condition should not be considered as sufficient cause for requiring replacement.

Ground Detection Systems

g. Ground detection systems should function properly. Where lamps are used, they should be of the proper wattage with the connections between the lamps grounded. Ground faults shall be cleared.

Temporary Wiring and Installations

h. Long extension cords, "jury-rigs," or temporary modifications are not satisfactory installations.

Portable Electric Equipment

i. New and replacement items shall meet the requirements outlined in chapter 18 of this volume. Existing equipment shall be serviceable and free from potential shock or fire hazards. Metal bodies of these items shall be grounded through grounding leads in the portable cord. To be effective, the grounding conductor on a tool or light must be connected to a grounding terminal. This conductor must be electrically continuous (the wire should not be broken anywhere along its length), this can be checked with an ohmmeter or megger. For portable devices made entirely of nonconducting material, or so constructed that dead metal parts will not become energized under any condition (double insulated construction), the grounding conductor in the portable cord and the grounding pole of the attachment plug need not be furnished. No splices or patching should be permitted in portable leads smaller than No. 12 American Wire Gauge (AWG). Splices shall be in accordance with 46 CFR 111.60-19. Careful checks shall be made of the condition of the cord where it enters the light or tool. This is a location of severe stress and bending fatigue, especially on items such as portable cargo lights. Cracking, brittleness, and heat discoloration of the cord at this point are sufficient reasons for rejection. If the device is to be rewired, only cords indicated in 46 CFR Table 111.60-13 for hard or extra-hard service should be used. Lighting fixtures should be examined to see that the interior insulation is satisfactory, particularly the lamp holder. Cracked porcelain or plastic lamp holders should be replaced. Devices in which the exterior case is cracked or damaged should be replaced or repaired.

Fire and Smoke Detection Systems

j. Fire and smoke detection systems shall be checked regularly, and faulty detectors shall be recalibrated or replaced. The following test methods may be used:

Thermal detectors

(1) Thermal detectors may be tested by replacing the guard and globe with a sheet metal shield and using a portable light as the heat source; this will not cause damage to the adjacent paintwork. The activation temperature range should be as specified in 46 CFR 161.002-11.

Photoelectric and ionization smoke detectors

(2) Photoelectric and ionization smoke detectors may be tested by holding "pink sticks" or other smoke source near the detector.

Infrared detectors

(3) Infrared detectors may be tested with a candle or other flame source.

NOTE: Infrared detectors often have a response delay.

Vital Machinery

k. Motors, motor starters, and control switches used with machinery vital to the safety or propulsion of the vessel shall be visually examined for condition and suitable nameplate ratings. When there is evidence of deterioration, they shall be opened for closer inspection.

Electrical Cooking Equipment	l.	Electrical cooking equipment shall be maintained in good condition. There should be no evidence of grease or dirt buildup nor deterioration of the equipment.

K. LEAKAGE ONTO PROPULSION CONTROL CIRCUITS, SWITCHBOARDS, ETC.

The 1974 casualty to the tank vessel TRANSHURON was caused by water spraying onto the main propulsion control area, from a failed cooling water gauge nipple for the vessel's air conditioning system. In a similar casualty, water leaked onto a vessel's main switchboard from an exterior electrical junction box that had filled with water. The conduit and wire provided the path to the switchboard. These casualties demonstrate clearly that shielding or other measures must be used to guard against accidental discharge of water onto electrical propulsion installations. All water lines must be located clear of control circuits, electrical equipment, and areas of high voltage whenever possible. Cables to switchboards, controllers, etc., should be connected so as to prevent water from entering connectors, through use of drip loops, joining cables to the bottom side of the installation, or similar methods.

L. EMERGENCY LIGHTING AND POWER SYSTEMS

1. Introduction

Recent casualty reports indicate that in some instances emergency diesel generators and associated equipment were not maintained in a satisfactory state of readiness for emergency use. Periodic testing by vessel personnel of the emergency lighting and power systems installed, and the recording of such tests in official logbooks, are required by 46 CFR 35.10-15, 78.17-45, and 97.15-30. The regulations for tank vessels, passenger vessels, cargo and miscellaneous vessels, and the electrical engineering requirements intend that emergency lighting and power installations are tested in the presence of an inspector. Testing of a properly functioning emergency plant can be accomplished quickly with little or no interruption of normal service. 46 CFR Table 112.05-5(a) notes vessels required to have an emergency source of power meeting the requirements of 46 CFR 112. Also, see NVIC 2-89 *Electrical Installations on Merchant Vessels and MODUs.*

2. Testing

At each inspection, and whenever emergency drills are conducted, light and power emergency systems shall be tested as follows:

Automatic Starting and Connecting Power Systems

a. These systems should be tested by using the test switch required in 46 CFR 112.45-5. When the switch is put in the test position, the following should occur in less than 45 seconds:

(1) Bus-tie breaker opens;

(2) Power source should automatically start (if the power source is a battery, this step will be skipped); and

(3) Required loads will be transferred to the emergency power source when the voltage reaches 85-95 percent of final value, i.e., the generator circuit breaker closes. This will happen immediately for a battery source. Upon completion of the test, loads should be transferred back to the normal source and the emergency system set up for automatic operation.

Manual Transfer System

b. Test as indicated above, except that step (2) will occur as the result of a manual action. All other functions remain automatic.

Alarm Relay Circuits

c. When conducting operational tests of the emergency diesel generator, for initial certification or after modifications have been made, inspectors should have the shipboard personnel conducting the test temporarily disconnect any remote alarm relay circuits. When this is done, the emergency diesel generator should continue to function. If the generator fails to operate with the remote alarm relay circuits disconnected, a requirement should be issued to modify the installation to allow operation of the emergency diesel generator with these circuits disabled. At the conclusion of this test, the inspector should ensure that remote alarm circuits are properly reconnected.

Alternatives

d. Some passenger vessels contracted for prior to 19 November 1952 may not be arranged for testing as outlined above. Tests of such vessels should be performed in a manner compatible with their arrangements. Many older vessels have an inport or standby generator (and no "emergency plant" as such). These are usually arranged to feed directly to the main switchboard, and cannot be tested in the manner outlined above. The testing of such standby units shall be prescribed by the OCMI.

M. INSPECTION OF RADIO EQUIPMENT

1. General Practices

Cooperation with the FCC

a. When the OCMI is notified by representatives of the FCC that technical deficiencies exist in a vessel's radio installation, the Safety Radiotelephony or Radiotelegraphy Certificate should be withheld until the deficiencies are corrected and the OCMI receives formal notice to that effect from the FCC.

Interagency Resolution of Deficiencies

b. In cases where such deficiencies exist on a vessel already in possession of a Safety Certificate, the OCMI shall withdraw the certificate upon the FCC's request. Inspectors should consult with local FCC representatives before taking action in such circumstances, and shall cooperate fully with FCC inspectors to carry out the intent of these instructions. The COI should not be withheld or withdrawn for technical deficiencies in radio installations.[1]

[1]**NOTE:** See MSM II-E2 regarding Safety Radiotelegraphy and Safety Radiotelephony Certificates, and MSM II-C2 regarding portable lifeboat radio equipment.

[2]**NOTE:** All electrical wiring in the radio room not connected with the radio installation itself is under the sole jurisdiction of the Coast Guard.

c. It should be remembered that the technical adequacy of the radio installation, the suitability of electrical wiring to interconnect components of the radio, and the proper maintenance and efficient operation of the equipment are determined solely by FCC inspectors.[2] The suitability of power leads from the main power supply to the main installation in the radio room is solely the responsibility of the Coast Guard. The amount of power and character of the supply, however, must be determined by the FCC to operate the radio installation and its auxiliary equipment properly and efficiently. The FCC will notify the OCMI of any observed inadequacies in the power supply; the OCMI shall ensure that such deficiencies are corrected.

➔ See Table 47 CFR 80, for good general information and cites on FCC regulations

2. Emergency Radio Gear

The installation of all ship's radio equipment must be approved by the Coast Guard. In this regard, the inspector shall be satisfied that the main and emergency radio installations are located in the superstructure of the ship, as high as practical above the highest marked load line. The emergency installation shall be provided with a source of power independent of the propulsion and main electrical systems; it must be capable of being energized rapidly and operating continuously for at least 6 hours.

NOTE: Use of the emergency radio power for other than radio equipment and emergency lights in the radio room is prohibited.

N. HAZARDS AND UNSAFE PRACTICES

1. Introduction

The following policy is intended to promote the detection, reporting, and correction of those practices and situations that tend to cause injury or death to personnel and damage to the vessel or its cargo. Safety considerations based on "good marine practice" are directly related to the equipment and construction to which attention is directed by the regulations, and for which separate reports are required. Obviously, a vessel with defective cargo gear, dangerous gangways or access ladders, unguarded openings in the holds, poorly lighted working spaces, or similar hazards is not in a condition sufficient to warrant the judgment that it is suitable for service. Traditionally, it is the duty of the vessel's officers to see that dangerous conditions are corrected immediately. Aspects of "good marine practice" may not always be spelled out in statutes or regulations, because to do so would be impractical. Practices of good seamanship and good shipkeeping will vary according to the size, design, and operating conditions of a particular vessel. However, it is of paramount importance that general safety considerations are kept in mind aboard vessels at all times. When hazards are noticed, immediate steps shall be taken to keep working conditions as safe as reasonably possible.

2. Statutory Requirements

Congressional enactment's for safety of life and property on board vessels apply at all times when a vessel is in service, whether alongside the dock, anchored, or underway. The basic responsibilities of the Coast Guard to inspect ships periodically for safety purposes are imposed by 46 U.S.C. Chapter 33. The statutes contained therein authorize the Coast Guard to inspect ships periodically for safety purposes.

3. Respons - bility of the Crew

The master and other ship's officers are responsible for maintaining safe working conditions, and for supervising or establishing proper supervision of all employment aboard a vessel. All hazardous work should be personally supervised by a competent ship's officer. Inattention to duty or negligence on the part of any officer in permitting unsafe conditions or practices should be admonished or, if sufficiently severe, charged against that officer's license. The primary objectives are to improve safety and to indoctrinate ship's officers in their responsibilities. However, all persons employed aboard have a mutual responsibility to carry out established procedures for the safety of themselves and their fellow mariners.

4. Responsibility of the Coast Guard

A marine inspector or other Coast Guard boarding officer, when aboard an inspected or uninspected vessel for any purpose, should be alert to unsafe practices and hazardous situations. The inspector must take proper and immediate action to have unsafe practices stopped and hazardous situations remedied. Such action will, of course, vary with the situation encountered. In many cases, calling the attention of the ship's officers or master to the situation will be sufficient. In certain instances, it may be necessary to issue a Form CG-835 (Merchant Marine Inspection Requirement) to cover a deficiency. Serious cases, or those in which there is disagreement over the proper course of action, should be brought to the attention of the OCMI immediately. Revocation of the vessel's COI, action against an officer's license, or submittal of a Report of Violation should be undertaken when necessary. The OCMI shall give personal attention to reported instances of unsafe practices and hazardous situations, to the end that the greatest possible safety is obtained on vessels operating under the OCMI's jurisdiction.

5. Remedies for Hazardous Situations

General Practices

a. All dangerous areas and installations that are exposed must be properly protected with covers, guards, or rails, in accordance with 46 CFR 32.01-10, 32.01-15, 58.01-20, 72.40, 92.25, and 190.25-15. These regulations also specify the height and number of courses of rails on passenger and crew decks. Two avenues of escape should be provided from every area within a vessel where passengers or crew may be quartered, or where anyone may normally be employed (see 46 CFR 32.01-1, 72.10, 92.10, and 190.10). While it is not always possible to provide such exits from cargo holds, the means of escape provided from these should be adequate and easily accessible.

Refrigerants

a. Refrigerants. The dangers inherent in the use and transportation of dry ice and carbon dioxide as refrigerants are often overlooked. The inherent dangers of dry ice were published, but only after a series of deaths of stevedores and crewmembers related to circumstances where dry ice was used as a refrigerant. Container cargo may be refrigerated by introduction of liquid nitrogen into the container, where it evaporates and thus chills the contents. Unless sufficient time elapses for complete evaporation before the container is loaded aboard ship, there is a risk of spillage of the liquid nitrogen. Since the temperature of liquid nitrogen (-320F) cannot be withstood by ordinary ship steel, spillage can result in fractures. Carbon dioxide and nitrogen can be asphyxiating when concentrated in tanks or holds. All refrigerants must be recognized as potentially dangerous substances and treated accordingly.

Boiler Torch Pots

b. Pots should be secured in a vertical position, not at an angle. Low-flash point liquids should never be used in torch pots, and fireroom personnel should be instructed in the dangers of any highly combustible liquid having a flash point lower than that of commercial kerosene, which is used for moistening the torch.

Gratings

c. Some machinery spaces lack gratings over the top of the main condensers to provide safe platforms for oiling the intermediate pressure links, adjusting the cutoffs, and accessing the indicator cocks. A grating with handrails over the main condenser is required to ensure the safety of engineroom personnel during the performance of their duties; its requirement comes within the intent of 46 CFR 32.01-15 and 58.01-20. (See also Sec. A, Ch. 5 of this volume.)

Fuel Oil in Bilges

d. At annual inspections, the inspector shall examine the bilges and tank tops beneath the boilers and in any compartment in which oil burning equipment or fuel tanks are installed, to ensure that there are no accumulations of fuel oil that constitute a fire hazard.

Sparks and Stack Fires

e. Sparks or stack fires can result from the heating of soot and carbon deposits in preheaters, economizers and uptakes in boilers, and in exhaust manifolds and mufflers in diesels. A stack fire is particularly hazardous in that it can develop undetected and then materialize many hours after the machinery plant is secured, when fresh air reaches the hot carbon deposits. Some vessels have had stack fires long after the crew has departed at a shipyard or layup pier. As a precaution against stack fires or sparking, it is necessary to keep all uptakes and mufflers clean. This is best accomplished by efficient combustion and plant operation and attention to periodic maintenance and cleaning. Inspectors require the opening of adequate access plates to inspect thoroughly those areas where carbon may accumulate.

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6. Preventing Boiler Gas Explosions (Flarebacks)

Flareback in the furnace of a watertube boiler may be caused by the ignition of gases accumulating from vaporized oil that entered the furnace improperly, or ignition of vapors that have not been purged from the furnace before the "lighting off." The following procedures shall be brought to the attention of all engineering personnel, to reduce the hazards of flarebacks:

a. Before attempting to light off the first or additional burners, ensure that properly heated oil is available at the burner to be lighted. The recirculation line is provided for this purpose.

b. Before installing an atomizer, ensure that it is fitted with a sprayer plate, and that the burner tip is tightly made up.

c. Before lighting the first burner or again lighting off a burner after all have been extinguished, the forced draft fan should be run long enough, with double front damper and burner registers wide open, to ensure that the furnace is properly purged.

d. When lighting off the first burner or additional burner, always use a torch. Never attempt to light a burner from an adjacent burner or from hot furnace brickwork;

e. With the torch lit and in proper position, the last valve in the branch connection leading from the fuel oil header supply line to the burner should be slightly opened. As soon as ignition occurs, this valve should be fully opened. If ignition does not immediately occur, the burner valve should be closed and the furnace thoroughly purged. This entire operation shall be repeated until ignition occurs.

f. While a burner or burners are in service, the register door(s) should be wide open, and the oil temperature and pressure should be closely monitored. Cold oil or low oil pressure may cause the fires to die out; water in the oil may do the same. Should all burners be extinguished, the valves in the individual branch connections to the burners should be closed, the forced draft fan should be kept on, the double front damper and all burner register doors should be opened wide, and the furnace should be thoroughly purged before another attempt is made to light the burner.

Lighter-Aboard-Ship (LASH) Vessel Lighter Cranes

The extension of lighter guides aboard LASH barge-handling cranes may create significant personnel safety hazards. In separate incidents, despite various safety precautions, two mariners and three longshoremen were killed while lighters were being discharged. These people were caught by the hydraulically extended lighter guides of the LASH cranes and crushed against the barges. Operators of LASH vessels must take corrective action in accordance with 46 CFR 92.25-15. No specific method of personnel protection is required. However, such action must provide a degree of safety equivalent to that afforded by:

a. A mechanism to provide a delay of at least 3 seconds' duration, from actuation of the lighter guide extension controller and initial movement of the guide arms; and

b. A distinctive, continuously sounding alarm, to begin sounding at the delay period before guide extension. An alarm speaker shall be located on each crane leg, in immediate proximity to the point(s) of danger.

INSPECTION NOTE: At each inspection and reinspection for certification, the lighter crane on every LASH vessel shall be examined to ensure that the hazards described above have been corrected, through the installation of guards, rails, and warning devices. Plans and specifications for such installations shall be reviewed by the cognizant OCMI.

7. Explosions in Diesel-Fired Boilers

A number of explosions have occurred in auxiliary boilers that burn diesel oil. Many of these explosions have occurred on dual-fuel fired boilers upon switch over from diesel to heavy oil. These vessels had common fuel piping and heater systems. When the heavy oil and heater were switched in, a slug of diesel was also heated that altered the fuel-air mixture. Common fuel piping is prohibited because of fuel and burner nozzle tip contamination problems. An explosion can occur when the fuel-air mixture in the furnace is not properly controlled. Even very small accumulations of fuel oil in the boiler can produce explosive mixtures. Automatic control systems for diesel oil should therefore be very reliable and properly designed, operated, and maintained. At each inspection of a vessel equipped with diesel-fired boilers, the inspector shall ensure that the following procedures are followed:

a. Fuel oil shutoff valves shall be inspected or tested to ensure that there is no leakage;

b. Controls to shut down the boiler due to flame failure shall be tested to ensure safe boiler operation;

c. To prevent a vapor buildup from residual fuel in the furnace, no time should elapse between a furnace purge and a light off or ignition trial; and

d. Dual fueled boilers that heat a heavier oil should be examined to ensure that the piping of the lighter oil does not go through the heater.

8. Galley and Laundry Room Exhaust Ducts

A number of shipboard fires have originated in the exhaust ducts of galley ranges and fryers, and recently in laundry room ventilation systems. These fires have resulted in serious damage, injury, and loss of life aboard the vessels involved. Unmaintained exhaust duct work will become saturated with cooking grease and pose a fire hazard. Unfortunately, such areas have been overlooked during vessel inspections. The following procedures shall be followed during biennial and mid-period inspections of U.S. vessels and during SOLAS verification examinations of foreign vessels:

All Vessels

a. All Vessels.

(1) Remove the inspection plate from the galley exhaust duct.

(2) Disconnect the fusible link, if installed, and test the operation of the fire damper.

(3) Remove sufficient inspection plates to ensure that the duct work is clean and free of grease. Particular attention shall be given to long, horizontal duct runs.

(4) Examine all hood screens for cleanliness.

(5) If an extinguishing system is installed, ensure that it is in proper working condition.

(6) Examine laundry room vents, ask if the company has a cleaning and maintenance program (check records – part of ISM/SMS responsibility).

Passenger Vessels Only

b. Passenger Vessels Only.

(1) Remove sufficient overhead panels to ensure that the galley exhaust duct is suitably insulated, in accordance with SOLAS standards and applicable U.S. regulations. Unless changes are made to the duct work, this part of the examination need be made only once.

(2) Check all main and zone control valves of the sprinkler system to ensure that they are in the full open position.

9. Noise Factors in the Marine Environment

Introduction

a. The problem of excessive noise on commercial vessels and offshore drilling and production units has been the focus of an ongoing Coast Guard sponsored study. It has been found that personnel on virtually any type of vessel or unit may be exposed to damaging noise. Noise-induced hearing loss is a slow, progressive disorder that often goes unrecognized until it has become a pronounced handicap, generally in later years. Related problems, such as tinnitus (ringing in the ears) can be even worse. Excessive noise poses a potential threat to vessel safety by interfering with shipboard communications and the drowning out of signals and alarms.

Initial Coast Guard Actions

b. Previously, the Coast Guard dealt with maritime noise problems through existing regulations, in a general way or on a case-by-case basis. For example, 46 CFR 72.20-5 and 92.20-5 require accommodations aboard vessels to be insulated from undue noise. Similarly, 46 CFR 32.40-15 requires tankships and manned tank barges to have crew's quarters suitable for the accommodation and protection of the crew. 46 CFR 58.10-15(e) and 33 CFR 150.509(c) specify noise protection for personnel on gas turbine-propelled vessels and deepwater port facilities, respectively.

Establishment of Standards

c. In November 1981, the International Maritime Organization (IMO) published a Code on Noise Levels On Board Ships, Resolution A.468(XII). The Code applies to all vessels over 1600 GT built after publication of the Code. In June 1982, the Coast Guard published NVIC 12-82, "Recommendations on Control of Excessive Noise." These were developed in light of the IMO Code and are considered satisfactory implementations of the Code's standards. Therefore, vessels and units meeting the NVIC's standards are considered to meet those of the IMO Code as well. NVIC 12-82 deals with the entire spectrum of maritime noise and recommends a broad based program of noise control and hearing conservation. Its two major recommendations are a 24-hour noise exposure limit of 82 dB(A) for all personnel, and periodic audiometric examination of all personnel exposed to noise levels above a certain low exposure level of 77 dB(A). The only limits on noise levels (as opposed to exposure levels) apply to berthing spaces, and messing spaces on vessels over 1600 GT. These limits are 75 dB(A) for existing vessels and units, and 70 dB(A) on vessels and units constructed after December 31, 1985.

Inspection Procedures

c. The policy in NVIC 12-82 is based on the expectation that the maritime industry will voluntarily implement and maintain an effective noise control program, without direct Coast Guard involvement. The policy was developed with the assistance of industry and the Commandant anticipates its wide implementation. The role of inspection personnel is primarily to promote the policy contained in NVIC 12-82 and to note its effects. Therefore, there should be minimal Coast Guard enforcement concerning noise control. Inspectors should be alert to excessive noise levels during inspections, and require noise measurements to be taken to quantify levels of exposure. If excessive noise levels are verified, inspectors should require correction of deteriorated systems that permit production of unwarranted noise or the unnecessary transmission of noise to adjacent spaces. Inspectors should also examine the condition of hearing protection devices and the posting of warning signs, and verify that the vessel or unit's hearing conservation program is being followed.

NOTE: Complaints alleging that crewmembers have suffered hearing loss from long-term exposure to excessive noise shall not be considered as reportable marine casualties involving personal injury.

Handling Complaints

e. If a crewmember files a written complaint to eliminate a specific noise hazard, the situation should be evaluated and all discrepancies corrected. However, these measures should be taken by the vessel owner, upon the request of the OCMI. Only when the OCMI has reason to question the owner's evaluations should inspection personnel become involved in noise measurement. Criteria for determining whether noise levels or exposure periods are excessive should normally be those stated in NVIC 12-82, namely, the noise limits for berthing and messing spaces and the 24-hour noise exposure limit. If there is objection to the application of these criteria, the owner may suggest another recognized standard that meets or exceeds the standards of NVIC 12-82. It should be remembered that noise control is a complex science, requiring professional expertise to evaluate problems and develop effective remedies.

Program Review

f. NVIC 12-82 was issued to promote an industry standard, and to provide a methodology to evaluate noise in the marine environment. Over the next several years, the effectiveness and content of this policy will be reviewed. Effective program review can be obtained only through feedback from field units relating noteworthy experiences and observations of noise conditions and actions. Such reports and questions concerning NVIC 12-82 should be directed to Commandant (G-MOC-2).

O. INSPECTION OF PRESSURE VESSELS (P/VS)

1. Test and Examination Intervals

Periodic inspections of unfired P/Vs are required by 46 CFR 61.10. These regulations require the testing and examination to be conducted twice in 5 years. The testing and examination interval for bulk storage tanks containing refrigerated liquefied CO2 gas for use on board vessels as a firefighting agent should not extend beyond 10 years (120 months) from the last such test/exam. The aforestated authorization shall be exercised primarily to permit the test and examination interval to coincide with the vessel's drydocking or similar out of service availability period.

2. Purpose

Periodic examinations of P/Vs are intended to assess a P/Vs present condition to determine that it is satisfactory to continue in service at the pressure and environment of the system for which it is being used.

3. Factors Affecting P/Vs in Service

Pressure vessels are subject to different factors that can affect their physical conditions.

Internal

a. Water vapor, other gases, and particulate matter can cause corrosion in P/Vs. Interior coatings can affect the thoroughness of an internal examination if they "mask" the condition of the covered surface. Conversely, they can give an indication of trouble if deterioration of the metal results in a change to the appearance of the coating.

External

e. Depending on where and how the P/V is mounted, cyclic loading can be transmitted to the P/V through its saddles/support framework if the foundation is subject to movement. Vibration loads are commonly transmitted to a P/V through attached piping and rotating machinery. The motion of other machinery located in adjacent areas can transmit loads through the deck and bulkheads to a P/V. Mechanical damage can occur if heavy objects contact the P/V or any of its attached piping.

4. Inspection Descriptions

Visual Examinations

a. Accessibility to the internal surfaces is the primary consideration when conducting visual examinations. Each pressure vessel stamped with the Coast Guard symbol, and each pressure vessel in a system regulated under 46 CFR 58.60 that is fitted with a manhole or other inspection opening so it can be satisfactorily examined internally, must be opened twice within any 5 year period, except that no more than 3 years may elapse between any examination and its immediate predecessor. Each pressure vessel must be thoroughly examined internally and externally. No pressure vessel need be hydrostatically tested except when any defect in a pressure vessel is found that, in the marine inspector's opinion, may affect the safety of the pressure vessel. If a hydrostatic test is warranted, the pressure vessel shall be tested at a pressure of 1 ½ times the maximum allowable working pressure. Section VIII, Part UG-46 of the ASME Code has standards for openings in P/Vs. An elliptical manhole must not be less than 11" X 15" or 10" X 16"; a round manhole must not be less than 15" in diameter. Smaller openings may be acceptable if the inspector can satisfactorily examine the internal surfaces. The presence of a backing strip eliminates the possibility of a visual examination of the weld and may contribute to internal corrosion as a moisture trap. The presence of a backing strip does not, however, prevent the acceptance of an otherwise satisfactory visual examination. The inspector should consider other factors, such as the pressure vessel's service, condition, other signs of internal corrosion, age, and date of last hydrostatic test, when determining whether additional testing is warranted.

What To Look For

(1) All internal surfaces should be carefully examined for evidence of fractures or indications of deterioration. The heat affected zone adjacent to all welds should be given special attention. All welded joints, as well as all nozzle connections and similar openings, should be thoroughly examined. Problem areas of the internal surfaces include low spots where water and grit accumulate, areas adjacent to openings (particularly the drain), welds, and their heat affected zones. Problem areas associated with the external surfaces include welded attachments, such as support webs, and areas around openings, particularly if the P/V is insulated. The external appearance of insulating materials should not be accepted as indicative of the condition of the welds or the shell and head material. If the insulation materials separate from the P/V, condensate can be trapped beneath the insulation and cause metal deterioration. The insulation should be carefully examined visually and any "suspect" areas should be sounded to determine the extent of separation from the P/V. These areas should have their insulation excavated back to a zone of good adhesion, the metal examined, and the insulation then repaired in accordance with the manufacturer's recommended procedures.

Presently there are no regulatory or industry requirements for insulation to be periodically removed to allow visual examination of the P/V. Areas that often suffer separation are those surrounding view ports, areas surrounding pipe connections that transmit vibration to the P/V, and any projection in the upper portion of the P/V where rain or condensation normally contact the P/V.

How to Look

(2) Two critical factors are illumination and accessibility. There must be sufficient light to allow a thorough examination of all welds and plate surfaces. Bright illumination is necessary for all visual examinations. If access to the internal areas is limited to small "inspection openings," a flashlight beam directed through such openings may not provide sufficient illumination for examination. When this occurs, other types of lighting can be used, e.g., flexible lights, borescopes, etc. If the P/V is equipped with a manhole the inspector should be able to get inside, close enough to scrutinize all internal areas. The P/V must be clean enough to allow a thorough examination of all surfaces; the presence of water, grit, or other matter inhibits examination. If the inspector cannot satisfactorily see the area of concern with a bright light directed at the area being examined, a "satisfactory" internal examination cannot be conducted and the vessel should be tested by means acceptable to the OCMI to satisfy the periodic inspection requirement.[1]

NOTE: It is a prerequisite that a satisfactory internal examination of a pressure vessel be completed by a marine inspector before that inspector is authorized to exempt the pressure vessel from hydrostatic testing in accordance with 46CFR 61.10-5(b). For any pressure vessel which is constructed in such a way so as to restrict or limit visual accessibility to internal areas of interest to an inspector, in lieu of an internal exam, or when deemed necessary by the attending inspector, a hydrostatic testing or a suitable alternative acceptable to the OCMI is not only mandated by regulation but is also prudent from an operational standpoint.

SAFETY NOTE: *Precautions concerning entry into a pressure vessel (P/V).* If the P/V has suffered heavy rusting there may be dangerously low levels of oxygen inside. Similarly, if the P/V has carried a hazardous substance or has been cleaned with a product that can affect a person's health, the P/V should be cleaned, vented, and certified "safe for entry" prior to doing an internal.

Alternatives

(3) No pressure vessel need be hydrostatically tested except when a defect is found that, in the marine inspector's opinion, may affect the safety of the pressure vessel. In this case, the pressure vessel should be hydrostatically tested at a pressure of 1 ½ times the maximum working pressure (see 46 CFR 61.10-5 for specific guidance). Nondestructive testing (NDT) methods can be authorized as a substitute for the required hydrostatic test. A plan to employ NDT should be discussed with the cognizant OCMI. The methods used must provide examinations of all welds and high stress areas as well as thickness gauging of the lower portion of the P/V. Usually this will include shear wave ultrasonic procedures for crack detection in welds or the shell (high stress areas adjacent to the heads), and standard compression wave procedures for thickness gauging. The amount and type(s) of NDT used must satisfy the OCMI, the test action(s) should be witnessed by a Coast Guard inspector, and the details of the test should be appropriately noted in the inspection record. Items to be considered when evaluating the plan include the P/Vs age, service, conditions of operation, and examination history, especially the methods used and results of past inspections. The use of NDT in lieu of hydrostatic testing may be appropriate when there is a question of compatibility between the water and the working fluid or interior coatings. Additionally, when the working fluid cannot be used for the test because of personnel hazards or flammability (see 46 CFR 61.10-5(f) and (h)) and when the weight of the water used during the test cannot be safely supported by the P/Vs substructure, the OCMI may accept NDT in lieu of hydrostatic testing.

NOTE: Backing strips (rings) and butt welded joints with one plate edge offset (see UW 13.1(k) of the ASME Code) may prevent adequate interpretation of NDT.

(4) Problems Found During Visual Exams. If deterioration affecting the strength of the heads, shell, or welds, or evidence of a fracture is found, the extent of the problem should be determined by NDT so that repairs, if possible, can be made. If any condition causes doubt, NDT should be used to confirm that a problem exists. Whenever possible, a 125 percent MAWP hydrostatic test should be conducted to determine the suitability of a P/V for continued service. If a condition requires repair, it may be necessary to remove the P/V from service until the problem has been corrected. Repairs of P/V's should be made only as allowed by 46 CFR 59 and the ASME Code. Weld procedure information and similar guidance for repairs are available through Commandant (G-MOC) and the Marine Safety Center (MSC). Additional NDT and a hydrostatic test should be required for any P/V after repairs have been completed. The test pressure should be the same as that required by the Code at original construction: 150 percent MAWP for Section VIII, Division 1 or 125 percent MAWP for

Division 2. Foreign-built P/V's that have been accepted with design safety factors less than 4:1 should have a test pressure specified by the Coast Guard as noted above.

Hydrostatic Test

b. A hydrostatic test at a pressure equal to 125 percent of the MAWP subjects the P/V to loads that it will not be exposed to, but is reasonable to assume the P/V can withstand, under ordinary conditions. The test pressure should be applied for a sufficient period of time to allow the load to act on any defect. For air receivers, a period of 5 to 10 minutes is normally adequate. If the P/V has developed a crack or has suffered deterioration, the hydrostatic test will be proof of its present condition. Simply stated, if the P/V under test pressure does not rupture, then it can be assumed that it is acceptable for continued service. If the P/V fails while under hydrostatic pressure, the load will be quickly relieved as the water vents through any resulting fracture. In some special circumstances the appropriate test pressure to satisfy the periodic testing requirements is less than 125 percent of the P/V's MAWP. Many foreign-built P/V's and some domestically-built P/V's, such as those built to ASME Section VIII, Division 2, do not meet the allowable stress criteria of ASME Section VIII, Division 1. Instead, they are designed for higher allowable stresses and for this reason are allowed to be tested at a pressure designated by the Coast Guard during the plan review process. This fact may not always be obvious and marine inspectors should carefully review the P/V's data plate to determine the appropriate test pressure. Hydrostatic leak tests for P/V's used for the storage of air or similar compressible gases require the P/V to be depressurized and then filled with water. In order to properly fill the P/V with water it must be vented at its highest point. The relief valve must be removed and its opening plugged tightly. All other connections to the P/V must be closed tight or removed and plugged. The inspector should trace the water source upstream from the P/V to verify supply, and should also verify water pressure in the P/V. This is normally accomplished with a pressure gauge installed on the P/V. A word of caution is offered against the use of very cold water as the test fluid. In rare instances, with water at temperatures near freezing, embrittlement can result and cause failure of welds during a test. The test fluid should be no less than 60 degrees Fahrenheit if possible. After the pressure has been increased to 125 percent MAWP, the supply should be secured and the pressure held for a period of time sufficient to determine that there are no leaks. During this time the inspector should examine all the exterior surfaces of the P/V, with special attention given to the welds and their heat affected zones of all nozzles, manways, and similar openings.

Other Test Considerations

c. The regulations in 46 CFR 197.462(b) and (d) require periodic pneumatic and hydrostatic tests of pressure vessels for human occupancy (PVHO's) and contain guidelines for these tests. Whenever a compressed gas "leak" test or pneumatic "overpressure test" is performed, certain additional safeguards should be employed. The regulations include a general requirement for "suitable precautions" for these tests. Such items would include ensuring that the P/V is substantially bolted down to a firm foundation, conducting the test in a remote location (or, requiring all persons not involved with the test to leave the area until the test has been completed), and conducting the test with the P/V behind some form of a barrier or substantial structure (if possible). If the P/V is a multi-lock chamber, each lock should be pressurized separately.

Intervals for Testing

d. Each tank shall be subjected to the tests and inspections described in 46 CFR 38.25. Intervals for internal examinations and hydrostatic tests for Pressure Vessel Type Cargo Tanks (PVCTs) are to be computed from the date of the last credit internal examination or hydrostatic test. It is not intended that extensions for testing intervals be granted except in the most unusual circumstances. All requests by industry for extensions of internal examination or hydrostatic test intervals of PVCTs should be forwarded to Commandant (G-MOC) with an endorsement by the OCMI.

P. INSPECTION OF LIFESAVING SYSTEMS

1. Introduction

Each Title 46 CFR subchapter on inspected vessels requires that inspections for certification include tests and inspections of the lifesaving equipment. This section provides guidance on how to conduct those inspections and tests. The inspections and tests in this section are designed to verify that the equipment, as installed on the vessel, complies with regulations in 46 CFR Chapter I, and where applicable, the International Convention for the Safety of Life at Sea (SOLAS).

Conditions of Approval

a. The installation of each lifeboat, rescue boat, liferaft and their respective launching appliance must meet any special conditions of its approval. Any such conditions are identified on the equipment's Certificate of Approval (CGHQ Form 10030). Check approval records on MSIS.

b. Excess Lifesaving Equipment. Excess lifesaving equipment carried aboard inspected vessels shall be of approved types and kept in good operating condition.

NOTE: MSIS product is MIAE. Free-form command is "-MIAE,QNUM=160.035/0075" to see approval record for a lifeboat with an approval number 160.035/75/0, for example. The number after the "/" must have 4 numerics, zero-filled from the left if necessary. An approval number like "160.035/A75/0" is entered in MSIS as "160.035/A0075." Note that the number after the last "/" in the approval number is not used in MSIS commands.

Repair, Modification, and Special Inspection Procedures

c. See C2.H of this manual and various NVICs for more detailed information on repairs, modifications, and special inspections of lifesaving equipment. Under current SOLAS requirements (Regulations III/19.3 and III/52), maintenance instructions for all lifesaving equipment are required on board, and equipment is to be maintained according to the instructions. Some instructions may state or imply that certain inspections and repairs must be done by a manufacturer's representative. This is not enforceable, except for servicing of inflatable liferafts, servicing of non-disposable hydrostatic release units, and permanent repairs to inflated rescue boat components, all of which must be done by a Coast Guard approved facility. The inspector should be satisfied that other inspections and repairs are carried out by competent persons. In some cases, a manufacturer's representative may be the only available choice.

Loading Procedures

d. Many of the tests for launching appliances in this section require the boat to be loaded or overloaded with deadweight. Adequate safety precautions should be taken during loading of the boat. Personnel should not be permitted to be used in the tests that load the boat to or beyond rated capacity, except as is absolutely necessary to load or unload the boat, or perform some part of the test once the boat has reached the water.

(1) Open lifeboats are required to have engine boxes that are watertight up to the level of the cover. Although not recommended, the owner or shipyard may elect to load an open boat by filling it with water. (See NVIC 6-81 for details on using water for this purpose and use of a test waterline.)

(2) Enclosed and partially enclosed boats do not normally have watertight engine boxes and can not be flooded. Any weights that can be properly distributed can be used.

(3) Experience has shown that bags of sand or other fine material inevitably leak and create a cleanup problem. Bags of lead shot with carrying handles are more efficient and less likely to be a problem.

(4) Large water containers can be used. Large capacity water bags may be difficult to use successfully. These bags, without baffles or compartments, allow a free surface effect that can destabilize the lifeboat, especially if the bags are at or above seating level, raising the center of gravity. This method may also not provide for a thorough distribution of weight. Smaller bags or buckets of a capacity easily handled should be used and distributed uniformly, including the area in way of the keel.

Weight Conditions "A" And "B"

e. Lifeboats have two weights stamped on their approval plates. The condition "A" weight is the empty boat without equipment and fuel. The condition "B" weight is condition "A" plus the weight of all equipment, fuel and the number of persons for which the boat is approved. The standard weight used to compute the "B" weight is 165 lb. or 75 kg per person.

Definitions

f.

(1) Auxiliary Launching Systems consisting of a winch and davit arrangement, are provided for free-fall lifeboats for use in those cases where it may be unsafe to launch the boat in free-fall. These systems must meet many of the same requirements as a conventional davit and winch.

(2) Fleet Angle for a wire rope leading to a winch drum means the angle included between an imaginary line from the lead sheave perpendicular to the axis of the drum, and the line formed by the wire rope when led from the lead sheave to either extremity of the drum. (See Figure B1-5.)

(3) Free-Fall Launching Systems launch a survival craft by allowing it to fall from its stowage position into the sea, with persons on board. Most free-fall systems include a ramp that the survival craft slides down before it begins its free-fall. Special seating, hull design, and fall trajectory provide for the safety of those on board, and also ensure that the craft moves away from the vessel when it enters the water, whether or not the engine has been started.

(4) Inflatable Buoyant Apparatus (IBA) are similar to inflatable liferafts, except they do not have canopies. Larger IBAs can be used either side up. IBAs must be serviced in the same way as inflatable liferafts. On vessels IBAs can be used interchangeably with conventional life floats and buoyant apparatus. With the approval of the Commandant (G-MOC), they may be allowed to be substituted for inflatable liferafts on inshore waters.

(5) Marine Evacuation Systems (MES) consist of a slide or chute, an inflatable platform, and associated survival craft, designed to rapidly transfer large numbers of persons from an embarkation station directly to the survival craft, or to the platform for subsequent embarkation into the survival craft.

(6) SOLAS 74/83 means the 1983 Amendments to the International Convention for the Safety of Life at Sea, 1974. These amendments include a completely revised Chapter III on Lifesaving Appliances and Arrangements, including upgraded performance requirements for almost all lifesaving equipment. The SOLAS 74/83 requirements apply in full to ships built on or after 1 July 1986. With some exceptions, equipment for older ships brought on board on or after 1 July 1986 must also meet the SOLAS 74/83 requirements. (See NVIC 3-87 for more details on the applicability of SOLAS 74/83.)

2. Initial Inspections

The following inspections are intended for a vessel undergoing its initial inspection for certification. The applicable tests should also be conducted whenever new lifesaving equipment is installed on any vessel, or whenever any item of lifesaving equipment is structurally repaired, altered, or undergoes any other major repair which could affect its performance. This section is written assuming that equipment on a vessel undergoing its initial inspection is new.

Davit and Winch Launching Systems for Lifeboats

a. Davit and Winch Launching Systems for Lifeboats, Including Auxiliary Launching Systems for Free-Fall Lifeboats. (See sections C2.H.6 through C2.H.8 for detailed information on certain situations concerning boat handling equipment.)

Preparation for Launching

(1) Preparation for Launching

(a) Procedure. Determine the time required for two crew members to prepare the boat for launching. Time starts with the two crew members at the boat launching station, and the boat stowed as it normally would be when the vessel is at sea. Preparation is complete once a launching crew (at least three persons) is on board and ready for launch.

(b) Acceptance Criteria. The time to prepare the boat for launching must be 5 minutes or less.

Light Load

(2) Operating the launching system at light load demonstrates that the mass of the boat is sufficient to overcome the frictional resistance of the winch, falls, sheaves, blocks, and associated gear. It verifies that the minimum lowering speed can be achieved in this condition. For boats with a hydrostatic lock on the release mechanism, it verifies that the lock operates at the lowest operational hydrostatic pressure. This test can generally be completed quickly, since no special loading is required for a fully equipped boat.

(a) Procedure.

(i) The boat should approximate its condition "A" weight for this test, with added weight of equipment and fuel on board. Precise loading and load measurement is not necessary, however. In addition, one person may be on board to operate an on-board winch brake control or the release mechanism. If additional personnel are needed to complete the test and to recover the boat, they may board when the boat reaches the water.

(ii) Release the gripes, if necessary. Tricing, frapping, and/or bowsing gear do not need to be used for this test if they are not needed.

(iii) Lower the boat by releasing the winch brake. If the winch brake is arranged for control from within the boat, a person on board the boat should operate the winch brake control.

(iv) Determine lowering speed by timing the boat as it drops through a measured distance marked on the side of the vessel or on the falls, or by any other reliable means. The speed measurement should be taken only after the winch has accelerated to full-governed speed.

(v) Launch the boat into the water using the normal launching procedure. There are three different operational modes for approved release mechanisms, with the "normal" procedure being different for each.

- "SOLAS 74/83" type release mechanisms have a hydrostatic lock that allows the hooks to be released once the boat is in the water. With the keel of the boat at or just in the water and tension on the falls, it should be verified that the hydrostatic lock prevents operation of the release mechanism. Then with the boat lowered into the water, the hydrostatic lock should open and permit operation of the release mechanism.

- An automatic release mechanism is sometimes used on a boat or survival capsule with a single fall launching system. Once set or cocked, these devices release as soon as tension is off the fall. Set these devices for automatic operation for this test. If a person will be on board the boat as it is lowered, that person should set the release mechanism for automatic operation just before the boat reaches the water.

- On-load release mechanisms such as "Rottmer" and "Viking" gear will release the boat whenever the release handle is moved, whether the boat is in the water or not. Persons in command of the boat and operating this mechanism must fully understand the danger of serious injury or death resulting from premature operation. Release the boat from the falls using the on-load release mechanism control as the boat reaches the water. The keel of the boat should be at or in the water, but there should still be tension on the falls when the release mechanism is operated. The safety pin should not be removed until the boat is in position for release.

(vi) Recover the boat with the winch. Anyone on board the boat should disembark when it reaches deck level. No one should be on board the boat when the weight of the davit is taken up by the winch, and the davit moves into its stowage position. This is when most fall and fall attachment failures occur.

Acceptance Criteria

(b) Acceptance Criteria

(i) There shall be no deformation of or damage to the launching appliance or its connections to the vessel.

(ii) Except for free-fall lifeboat auxiliary launching systems, the lowering speed for systems with "SOLAS 74/83" winches (160.115 approval series) must be at least:

$$S = 0.7 (0.4 + (0.02 H))$$

where S is the speed of lowering in m/s, and H is the height in meters from davit head to the waterline at the lightest seagoing condition. (See figures B1-6 and B1-7.) For the purposes of this calculation, H shall not be greater than 30, regardless of the actual height of the davit head.

In English units, the formula is

$$S = 0.7 (79 + (1.2 H))$$

where S is in ft/min and H is in ft, with H not greater than 99.

(iii) Auxiliary launching systems for free-fall lifeboats shall safely and successfully lower the lifeboat, but no minimum speed applies.

(iv) The lowering speed for systems with winches approved only under the 160.015 approval series shall be at least 40 ft/min (0.2 m/s), except that in the case of winches designed for passenger vessel emergency lifeboats, the speed shall be at least 60 ft/min (0.3 m/s).

NOTE: A "SOLAS 74/83" winch in the 160.115 approval series may be used to replace a winch in an older davit installation where the higher speed requirements do not apply. In this case, the winch may be set up to meet the speed requirement in this paragraph, rather than the requirement in paragraph (ii).

(v) The brake must be a "deadman" type, always applied unless the operator holds the control handle or mechanism in the position to lower the boat. If the operator releases the brake handle/mechanism, the handle/mechanism returns to the "stop" position, thus applying the brake and stopping the boat. No additional force is permitted.

(vi) Each winch drum shall be arranged so the fall wire winds onto the drum in a level wrap. There shall be no more than one layer of wire on the drum when the davit is in stowed position, except that if the maximum fleet angle is not more than 4° on a 160.115 approval series winch, two layers of wire are acceptable on a grooved drum. Otherwise, each winch drum that has a maximum fleet angle of more than 4° shall be a grooved drum. The fleet angle shall not exceed 8° in any winch installation.

(vii) For a multiple fall system, the falls must wind off the drums at the same rate when lowering. The falls must wind onto the drums evenly and at the same rate when hoisting.

(viii) For launching appliances arranged for control from within the boat, there are two basic types of control. One of these types uses a control wire that pays out as the boat lowers. The control wire must properly operate the winch brake throughout the launching sequence. There must be sufficient length of control wire available inside the boat to operate the winch brake until the boat is released from the falls. The other type is a "pull-and-go" system. An operator in the boat pulls a control lever or handle on the launching appliance that is accessible from a position on board the boat. Once the control is activated, it holds the brake control in the "lower" position, until a crew member on deck returns it to "stop."

(ix) The release mechanism must open all hooks simultaneously and release the boat into the water in the intended manner.

(x) Except for free-fall lifeboat auxiliary launching systems, survival craft installations meeting the SOLAS 74/83 requirements must be capable of launching the survival craft under unfavorable conditions of trim of up to 10° and with the vessel listed up to 20° either way. For other installations, the trim requirement is 10°, but the list requirement is 15°. Prototype launching systems are tested at these extremes prior to approval. It will not normally be possible to test launching systems installed on a vessel at these extremes, but the inspector should verify that nothing about the installation would appear to impede launching under these conditions.

10 % Overload

(3) The 10% overload test demonstrates that the launching system can safely launch a fully loaded boat, with a 10% margin for overloading.

(a) Procedure.

(i) The boat must be in its embarkation position. Tricing pendants, if any, must be disconnected. The boat should be held alongside the ship during loading by means of the installed frapping, and/or bowsing gear.

(ii) Load the boat so that its total weight is 110% of the condition "B" weight shown on its data plate. Hold the boat in position for at least ten minutes and check for deformation, especially at davit and winch foundations and other load-bearing members.

(iii) Lower the boat using the normal lowering procedure, using the on-deck winch control position.

(iv) Determine lowering speed by timing the boat as it drops through a measured distance marked on the side of the vessel or on the falls, or by any other reliable means. The speed measurement should be taken only after the winch has accelerated to full governed speed.

(v) After the boat passes through the measured distance, stop lowering by releasing the winch brake control. Then alternately release and apply the brake so the boat stops at approximately 2 m (6 ft) intervals. Complete at least three start-stop cycles. The lowering operation should be carefully planned, so that the boat will not have to be raised to complete the start-stop cycles. Most winches will not be capable of raising the loaded boat.

(vi) Stop lowering just as the boat reaches the water. The keel of the boat should be at or in the water, but there should still be tension on the falls. Release the boat from the falls using the on-load release mechanism control. Release mechanisms with a hydrostatic lock will require use of the emergency override device to permit on-load release.

(vii) Unload the boat, recover it with the winch, and return it to its stowed position. Observe operation of the limit switches as the davit approaches the stowed position. Anyone on board the boat should disembark when the boat reaches deck level. No one should be on board the boat when the weight of the davit is taken up by the winch, and the davit moves into its stowage position. This is when most fall and fall attachment failures occur.

Acceptance Criteria

(b) Acceptance Criteria

(i) There shall be no deformation of or damage to the launching appliance or its connections to the vessel.

(ii) Except for free-fall lifeboat auxiliary launching systems, the lowering speed for systems with "SOLAS 74/83" winches (160.115 approval series) must be at least:

$$S = 0.4 + (0.02\ H)$$

where S is the speed of lowering in m/s, and H is the height in meters from davit head to the waterline at the lightest seagoing condition. (See figures 6-6 and 6-7.) For the purposes of this calculation, H shall not be greater than 30, regardless of the actual height of the davit head.

(In English units, the formula is

$$S = 79 + (1.2\ H)$$

where S is in ft/min and H is in ft, with H not greater than 99.)

(iii) Auxiliary launching systems for free-fall lifeboats shall safely and successfully lower the lifeboat, but no minimum speed applies.

(iv) The lowering speed for systems with "SOLAS 74/83" winches (160.115 approval series), including auxiliary systems for free-fall lifeboats, shall not exceed 1.3 m/s (256 ft/min).

(v) The lowering speed for systems with winches approved only under the 160.015 approval series shall not normally exceed 120 ft/min (0.6 m/s). The lowering speed for winches designed for passenger vessel emergency lifeboats shall not normally exceed 160 ft/min (0.8 m/s). Check certificates of approval, or approval records on MSIS for approved deviations from these requirements.

NOTE: A "SOLAS 74/83" winch in the 160.115 approval series may be used to replace a winch in an older davit installation where the higher speed requirements do not apply. In this case, the winch may be set up to meet the speed requirement in this paragraph, rather than the requirements in paragraphs (ii) and (iv).

(vi) The brake must be a "deadman" type, always applied unless the operator holds the control handle or mechanism in the position to lower the boat. If the operator releases the brake handle/mechanism, the handle/mechanism returns to the "stop" position, thus applying the brake and stopping the boat. No additional force is permitted.

(vii) The action of releasing the winch brake control must bring the boat to a stop within 1 m (39 in). No additional force on the winch brake control is permitted. The brake action must be smooth and positive.

(viii) Each winch drum shall be arranged so the fall wire winds onto the drum in a level wrap.

(ix) For a multiple fall system, the falls must wind off the drums at the same rate when lowering. The falls must wind onto the drums evenly and at the same rate when hoisting.

(x) For launching appliances arranged for control from within the boat, the untended control wire must feed out properly with the boat. The winch brake operation must not be affected by the mass of the fully extended control wire.

(xi) The release mechanism must open all hooks simultaneously and release the boat into the water.

(xii) The limit switches must disconnect the winch power source 0.3 m (12 in) or more before the davit reaches its fully stowed position.

Exposed Wet Brake

(4) Conduct this test if any winch brake surface is exposed to the weather.

(a) Procedure. Thoroughly wash down the exposed brake surfaces with water. Repeat the 10% overload test under section 6.R.2.a.(3) while the brake surfaces are still wet.

(b) Acceptance Criteria. The brake must stop the winch when the brake surface is wet, but the 1 m stopping distance requirement does not apply.

Launching Underway

(5) This test is intended to demonstrate that the boat can be launched satisfactorily when the vessel is underway at 5 knots, and also that the boat can be launched satisfactorily when the vessel is moored in a current. This test should normally be completed during the trial trip. The test may be waived if the builder, owner, or equipment manufacturer can provide evidence that such a test has been successfully completed for the boat/davit/winch combination on a sister vessel. For the purposes of this test, a sister vessel is one which is generally of the same size and hull form, and where the launching position, including height above the water line, is the same.

(a) Procedure. Launch one boat of each type on board with the vessel proceeding at a speed of approximately 5 knots. No special loading of the boat is required. Use the manufacturer's recommended launching procedure.

(b) Acceptance Criteria. The boat must not give any indication that it is unstable or out of control during the launching procedure. The boat's painter release device must operate as intended.

Free-Fall Lifeboat Launching Systems.

b. Free-fall lifeboat and launching system installation tests are conducted with the vessel within 3 degrees of even keel at its lightest seagoing draft. The tests described in this section may be conducted in any order appropriate to facilitate test loading. Inspectors and persons conducting these tests should have the International Maritime Organization's (IMO) circular on "Evaluation of Free-Fall Lifeboat Launch Performance" (MSC/Circ.616, 22 June 1993). This document may be purchased from:

International Maritime Organization
Publications Section
4 Albert Embankment
London SE1 7SR
ENGLAND

Telephone: +44 (71) 735-7611
Telefax: +44 (71) 587-3210
Telex: 23588

The Coast Guard Survival Systems Branch can provide copies to Coast Guard units or provide a current list of U.S. commercial sources for IMO documents:

U S COAST GUARD
SURVIVAL SYSTEMS BRANCH (G-MSE-4)
2100 SECOND ST SW
WASHINGTON DC 20593-0001

Telephone: (202) 267-1444
Telefax: (202) 267-1069
Telex: 892427 COASTGUARD WSH

Light Load

(1) Light Load

(a) Procedure.

(i) The boat may be arranged for launching by the on-deck control, or by a launching crew on board the boat. The on-deck control should be used with no one on board the boat the first time the boat is launched after its installation to make sure that the launching system is working properly. Although not required, trial launchings would normally be carried out by the manufacturer's representative before the inspection for certification begins.

(ii) The boat should approximate its condition "A" weight for this test, with added weight of equipment and fuel on board. Precise loading and load measurement is not necessary, however. In addition, the minimum launching crew may be on board to operate the on-board launching control. If additional personnel are needed to complete the test and to recover the boat, they may board when the boat reaches the water.

(iii) Launch the boat in free-fall, then retrieve and examine it.

Acceptance Criteria.

(b) Acceptance Criteria

(i) There shall be no deformation of or damage to the launching appliance or its connections to the vessel.

(ii) There shall be no deformation of or damage to any seat or seat mounting in the lifeboat.

(iii) There shall be no cracks or other structural damage to the hull of the lifeboat or any other structurally important part of lifeboat. Cracks in structural members of a free-fall lifeboat indicate that the structure must be replaced.

(iv) There shall be no cracks in non-structural members that could break loose during a free-fall launching.

(v) The free-fall release mechanism must operate properly and release the boat from the launching appliance.

(vi) The launching system must operate smoothly, must launch the boat into the water at the intended angle, and must not show any evidence of improper operation.

(vii) The lifeboat must not show any evidence of instability or dangerous characteristics during the launching sequence. Water entry angle will normally be between 40 degrees and 70 degrees from the horizontal. The momentum of the boat should move it away from the vessel after it enters the water.

(viii) There shall be no injury to any personnel in the boat attributable to the free-fall performance of the boat.

(ix) If the inspector has reason to believe that the boat is not being launched in a safe and proper manner, the inspector may order that the test be repeated with the boat instrumented with acceleration monitoring equipment. Consult the IMO Recommendation on "Evaluation of Free-Fall Lifeboat Launch Performance" for a discussion of free-fall launching theory and performance, as well as information on conducting tests. The monitoring and analysis should be done by, or under the supervision of, an independent laboratory accepted by the Commandant (G-MOC) for this purpose. The test results are compared with the approval test data to determine whether or not the boat is being launched in a safe and proper manner.

(2) Light Load Test

(a) Procedure.

(i) Load each seat in the lifeboat with 75 kg to 100 kg (165 lb. to 220 lb.) of deadweight properly secured in place to simulate the weight of one person. Add additional weights using equipment lockers, if necessary, to bring the total boat weight to 1.1 times the condition "B" weight.

(ii) Launch the boat in free-fall, then retrieve and examine it.

(b) The acceptance criteria are the same as those for the light load test.

(3) If the light load test was conducted without a launching crew on board, a free-fall launch must be made using a launching crew in the boat.

(a) Procedure. The launch must be completely controlled by the crew in the boat, as intended in an emergency situation. Any loading condition within the boat's approved limits may be used.

(b) Acceptance Criteria. The acceptance criteria are the same as those for the light load test.

(4) Conduct this test if the launching system incorporates an adjustable ramp.

(a) Procedure.

(i) Load each seat in the lifeboat with 75 kg to 100 kg (165 lb. to 220 lb.) of deadweight properly secured in place to simulate the weight of one person.

CHAPTER 2: VESSEL REINSPECTIONS

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CHAPTER 2: VESSEL REINSPECTIONS

A. INTRODUCTION

Vessel inspections occurring between those required periodically for certification by the vessel inspection laws are intended to focus more on the vessel's equipment and operating practices than on basic hull and machinery conditions. Reinspections vary in scope according to the conditions found, the vessel's previous record of maintenance, and the time available to the marine inspector. Such inspections should not become so perfunctory that the vessel's operator can predict its scope. However, they should verify that all parts of the vessel and its equipment are being maintained in a safe condition.

1. Scope of Reinspection

Special attention shall always be given to lifesaving and firefighting equipment and watertight closures during reinspection; the inspector should vary the degree of attention to individual items as circumstances require. Accessible parts of the hull and machinery that are prone to neglect and rapid deterioration shall be included in the reinspection. Great latitude is afforded the inspector in the scope of reinspection, based on his or her evaluation of the vessel's overall condition. At a minimum, the guidelines for International Convention for the Safety of Life at Sea (SOLAS) annual inspections shall be used for all vessel reinspections (see section E below).

2. Inspector's Obligations

The inspector shall be reasonably satisfied as to the condition of the vessel and its equipment, and shall ascertain that the degree of compliance with statutes, regulations, and the terms of the vessel's Certificate of Inspection (COI) warrant continued possession of the certificate. As conditions warrant, the inspector may conduct an inspection similar in scope to that of an inspection for certification. In any case, the scope of inspection shall be consistent with the requirements found in paragraph B.2 below.

3. Vessel Information Sources

In appraising the condition of a vessel and its equipment, the inspector shall use all available evidence, including the latest inspection findings, records of previous Coast Guard inspections, the opinions or records of other interested surveyors or inspectors, information furnished by the officers and crew, facts concerning the vessel's classification, and previous certification.

> **NOTE:** See 46 U.S.C. 3315 concerning the disclosure of sources of information.

The inspector may seek the advice of experts in the particular field involved, such as boilermakers, shipfitters, and welders, or the opinion of more experienced inspectors or technical personnel assigned to his or her unit. Based on this evidence and his or her own inspection, the inspector shall reach an independent conclusion as to vessel and equipment conditions and shall act accordingly. The officer in charge, marine inspection (OCMI) shall be consulted when there is doubt in the inspector's mind as to a proper course of action.

4. Commandant's Reinspection Policy

The Commandant's reinspection policy does not restrict an OCMI from requiring reinspection at any time when the OCMI believes that a vessel's degree of compliance no longer warrants continued possession of a COI. However, the OCMI should not require or encourage arbitrary and unnecessary reinspection. Minor defects or imperfections that do not in themselves hazard the vessel shall not be construed as rendering the vessel unfit for continued operation. Vessel owners shall be granted reasonable time to correct deficiencies that are noted.

B. REFERENCES

1. Statutes

Under 46 U.S.C. 3308, all vessels subject to inspections at frequencies specified by 46 U.S.C. 3307 shall be examined at proper times to ensure compliance with statutory and regulatory requirements. Under 46 U.S.C. 3714, tank vessels that carry liquid bulk dangerous cargoes shall be examined at least once annually. 43 U.S.C. 1348 requires annual inspection of mobile offshore drilling units (MODUs) operating on the U.S. Outer Continental Shelf (OCS).

2. Regulations

46 CFR 2.01-10(b) provides that the Coast Guard, on its own initiative, may examine, inspect, or reinspect vessels subject to certification at any time. The following regulations require the reinspection of certificated vessels at stated intervals and establish the scope of such inspections:

VESSEL TYPE	CFR CITE
Tank Vessels	46 CFR 31.10-17
Passenger Vessels	46 CFR 71.30
Cargo and Miscellaneous Vessels	46 CFR 91.27
Small Passenger Vessels	46 CFR 176.500 (Sub T) 46 CFR 115.500(Sub K)
Oceanographic Research Vessels	46 CFR 189.27

3. SOLAS Survey Requirements

Regulation 6(b), Chapter 1 of the 1978 SOLAS Protocol requires annual surveys of all cargo and tank vessels issued Cargo Ship Safety Construction Certificates (SAFCON) and Cargo Ship Safety Equipment Certificates (SEC). International Maritime Organization (IMO) Resolution A.413(XI), as amended by Resolution A.465(XII), provides an excellent, internationally accepted standard for conducting surveys. Section 7.E below summarizes the SOLAS requirements. Also see Chapter 20 of this volume.

C. REINSPECTIONS OF PASSENGER VESSELS

1. **Large Passenger Vessels (Subchapters K & H)**

Reinspections of passenger vessels holding 1-year COI's (certificated under 46 CFR, Subchapter H or K) shall be conducted at the discretion of the OCMI. For such vessels, an examination of all accessible parts of the hull and machinery that are most prone to neglect or damage, and of safety and operating equipment shall be carried out to the satisfaction of the inspector. Conditions that in themselves do not hazard the vessel, but indicate generally poor condition, should alert the inspector to broaden the scope of the reinspection (see 46 CFR 71.30 for Subchapter H or 46 CFR 115.500 for Subchapter K).

2. **Small Passenger Vessels ("T-Boats")**

The scope of reinspection of small passenger vessels, which hold 3-year certificates under 46 CFR, Subchapter T, is described in 46 CFR 176.10-5. In general, two reinspections should be performed on T-boats at approximately equal intervals between inspections for certification. The OCMI shall cooperate with owners and operators in scheduling reinspections insofar as possible, to create minimal interference with the normal operations of these vessels. For the reinspection of a T-boat whose COI was issued in another zone, previous inspection records should be obtained from the certificating OCMI. In such cases, the OCMI next inspecting the vessel should resolve any questions concerning the vessel's structure or equipment before issuing major requirements as a result of the reinspection.

NOTE: Steam powered T-boats require special consideration for the inspection of their boilers.

D. PERIODIC REINSPECTIONS OF TANK, CARGO, AND MISCELLANEOUS VESSELS

1. Introduction

Each tank, cargo, and miscellaneous vessel and MODU holding a 2-year COI shall be reinspected at least once during the life of the certificate. If a vessel has SOLAS certificates, a mandatory annual survey is required (See MSM II, Sec. E, Ch. 2). Regardless of the reasons for reinspection, the inspection standards are the same. This reinspection shall, if possible, be carried out between the 10th and 14th months following the date of issuance of the COI. In addition to this requirement, a reinspection shall be made coincident with a drydock examination, unless the owner or master requests a deferment.

2. Timing

If the reinspection is coincident with a drydock examination, it will meet the requirement for at least one reinspection during the life of the COI. If the drydock examination and reinspection coincide at any time other than at the required reinspection, they shall be considered jointly as an additional reinspection whose scope is governed by the time of drydocking relative to the date on the COI. For example, a reinspection occurring shortly after certification should normally be limited. A reinspection occurring shortly before the expiration of a COI should not duplicate the inspection for certification, but must be sufficient to ensure safe operation of the vessel. The scope of a reinspection held at other than the midperiod or drydocking period shall be determined by the OCMI.

3. Standards for Reinspections

This inspection is normally less detailed than the biennial inspection for certification. However, it shall be sufficient to verify that the vessel's condition and operation remain satisfactory, and that it can continue to operate safely. All accessible parts of the hull and machinery, especially those prone to rapid deterioration and neglect, shall be inspected. Lifesaving and firefighting equipment and watertight closures shall be given particular attention. Equipment and devices for vessel control shall be tested and emergency drills held, if practicable.

Reinspections required by 46 CFR 91.27 as described in this part of the MSM are mandatory. The continued validity of the Certificate of Inspection (COI) issued to the vessel is contingent upon this requirement being met. These reinspections may be conducted within the United States or at a foreign port or place. Reimbursement for travel and subsistence will be required when an owner/operator chooses to have the reinspection conducted at a foreign port or place.

At the one-year anniversary of the Certificate of Inspection, the certificating OCMI should issue a letter to the vessel's operator advising that the reinspection is due. The reinspection is due no later than the fourteenth month anniversary date of the COI. If after the fourteenth month of anniversary date of the COI the reinspection has not commenced, completed or deferred, the owner and operator will be advised that the vessel's COI is suspended under the authority of 46USC 3313(b)(4) until reinspection is complete. This notification will be made by letter and telephone/FAX and an appropriate entry will be made in MSIS and the local vessel file. Requests for deferment beyond the fourteenth month of the COI anniversary date will be closely evaluated by the cognizant OCMI on a case by case basis. Examples of situations in which deferments may be granted include rescheduling to make concurrent inspections ("harmonize" inspections) or the unavailability of inspection personnel.

4. RIN Alternative Provisions for OSVs

Offshore Supply Vessels. A new alternative inspection program for Offshore Supply Vessels (OSVs) under 400 gross tons and operating overseas allows owners/operators, or designated third parties, to perform an alternative mid-period examination and submit a report to the cognizant OCMI in lieu of having a marine inspector travel overseas to perform a midperiod reinspection. Liftboats are excluded from the program, and it does not delegate inspection duties to any private party.

a. When aboard any OSV under 400 gross tons, except Liftboats, marine inspectors should be aware that an OCMI may have to determine, at a later date, whether the vessel should be allowed to participate in the program. If the vessel previously participated in the alternative program, the inspector should pay close attention to deficiencies which may have existed before the midperiod, but were not corrected.

b. When deficiencies are reported in the alternative examination report, which is accepted in lieu of a Coast Guard midperiod reinspection, they should be entered into MSIS and tracked in the normal manner. The OCMI must establish compliance deadlines for "outstanding" deficiency items, or approve those proposed by the owner/operator. The OCMI may determine the report is so deficient that a Coast Guard midperiod reinspection is required. The owner/operator must be duly informed, and a time limit for scheduling the midperiod reinspection specified.

E. ADMINISTRATION OF REINSPECTIONS

1. Actions by the OCMI

The OCMI shall control reinspection of all vessels certificated in the zone, insofar as practicable, ensuring that other vessels within the zone are reinspected, as appropriate.[1]

[1]**NOTE:** This does not mean that a vessel certificated in one zone must be reinspected there.

The continued validity of the COI issued to a vessel is contingent upon the reinspection requirements being met. For those vessels that are issued a 2-year COI, the following procedures are applicable to ensure compliance with the requirements:

Notification

a. Notification.[2] At the 1-year anniversary of the COI, the certificating OCMI should issue a letter to the vessel's owner or operator advising that the reinspection is due. This notification is done as a matter of courtesy and does not affect the responsibility of the owner/operator to comply with the reinspection requirement.

Deferments

b. Deferments.[2] In the event an owner/operator requests deferment of the reinspection past the 14th month, the OCMI will evaluate the request and, if found justified, grant same. The owner/operator will be issued a requirement (either CG-835 or letter) to complete the reinspection within a specified length of time which will not exceed the 16th month of the period of validity of the COI. Requests for deferments past the 14th month should be closely evaluated. Failure to plan and schedule is not sufficient justification for delaying the reinspection.

[2]**NOTE:** These actions are applicable for small passenger vessels which require more than one reinspection between inspections for certification.

2. Actions by Owners, Operators, and Masters

General

a. The regulations require reinspection of certain vessels "where possible, between the tenth and fourteenth month of the period for which the Certificate is valid." (See paragraph B.2 above for citations.) It is the responsibility of the owner and operator to arrange for inspection before the end of the 14th month or, where that is not possible, to obtain a deferment from the OCMI. Failure to do so subjects the owner, operator, and others to civil penalty liability. The OCMI shall cooperate, insofar as practicable, with owners and operators to schedule reinspections to avoid conflict with operating schedules. Deferment requests that have merit should be granted when reinspection can be accomplished at a later time, provided a reinspection is conducted as noted above before expiration of the Certificate. Written application for reinspection is not required.

Responsibilities

b. Vessel representatives of tank, cargo, miscellaneous, and biennially-inspected oceanographic research vessels shall be advised of those items required by the regulations to be inspected, serviced, or replaced at certain intervals. Regardless of when a reinspection is held, it is the responsibility of the owner to ensure that required inspections and tests are held when due (e.g., hydrostatic tests of boilers and inspections of boiler mountings). If they are not, the owner faces legal penalties and possible revocation of the vessel's COI. The benefits of conducting these tests and inspections at regular inspection periods should be obvious to owners. Unexpected changes to a vessel's schedule may compel an owner to depart from this desired practice. In doing so, an owner does not become immediately liable for a penalty, but incurs the inconvenience of having to be reinspected at a later time. The vessel's representative shall be reminded of the responsibility to replace or service vessel equipment at the time due (see 46 CFR 31.10-18, 97.15-60, and 196.15-60).

Scope of Reinspection

c. Scope of Reinspection. Under Title 46 Code of Federal Regulations, Part 91.27-5 and similar cites in other subchapters, a reinspection is clearly not intended to be the equivalent to an inspection for certification. The scope of the reinspection should be appropriate to assure the attending inspector(s) of the continued safe operation of the vessel. The scope should vary according to the conditions found and the maintenance performed on the vessel, as a well as the vessel's safety history. In those instances where permitted (i.e., certain unmanned petroleum tank barges), the use of boarding petty officers specifically qualified to conduct reinspections is encouraged (See MSM II Sec. B, Ch. 4.D.8.).

F. RECORDS OF REINSPECTIONS

1. COI

Midperiod reinspections of tank, cargo, miscellaneous, oceanographic research vessels, and MODU's shall be recorded on the COI in the space provided. If these vessels have SOLAS certificates, the mandatory annual survey endorsement on the reverse of the SEC and the SAFCON (if issued) shall be completed by the OCMI or an authorized representative.

2. Form CG-2832

An entry noting reinspection shall also be made on Form CG-2832, Vessel Inspection Record, which is kept in the vessel's pilothouse.

3. Form CG-840, Inspection Book Series

Reinspections shall be recorded in the appropriate Form CG-840 booklet by the inspector. When a reinspection is of lesser scope (e.g., correcting specific discrepancies), a local examination form developed by the OCMI may be used to note the circumstances of the reinspection for local office records. When reinspection of a tank, cargo, miscellaneous, or oceanographic research vessel is performed in conjunction with a drydocking, but is not of the scope of a mid-period reinspection, it may be recorded in booklet Form CG-84OH, Drydock Examination Booklet, at the OCMI's discretion. The entry "Limited reinspection indicates satisfactory condition" will serve the purpose in such cases.

4. Marine Safety Information System (MSIS) Entries

Units shall make appropriate entries for all reinspections.

G. CRITICAL AREAS INSPECTION PLAN (CAIP) SURVEYS

General Surveys required as a part of a vessel's CAIP will be conducted as outlined in NVIC 15-91, NVIC 15-91, Change 1 and MSM II, Sec. A, Ch. 5 and Sec. B, Ch. 4.

CHAPTER 3: HULL EXAMINATIONS

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A. HULL EXAMINATIONS

1. Introduction

The Final Rule (Federal Register, Vol. 53, August 24, 1988) implementing the revised drydock and tailshaft regulations established three separate required examinations of a vessel's hull. These exams replace the all-inclusive examination previously referred to as a "drydock" exam and enable the Coast Guard to establish examination intervals which recognize the differences in vessel design and service. The required hull exams are the Drydock Examination (DE), Internal Structural Examination (ISE), and Cargo Tank Internal Examination (CTIE). The definition and scope of each exam, and the interval for each are specified in the applicable sections of 46 CFR.

NOTE: The revised drydock and tailshaft regulations do not apply to Subchapter T and Subchapter IA vessels.

NOTE: In determining the next due date for a vessel whose last exam was conducted on a "running" basis, credit for the last exam shall be given on the date that all the requirements of the exam were met, not on the date the exam began. In the future, "running" examinations should not be conducted.

2. Hull Exam Intervals

The new intervals will maximize the incidence of different requirements coming due at the same time. For the majority of oceangoing vessels, the intervals for all 3 examinations are the same, i.e., twice within any 5-year period with no more than 3 years between any 2 exams. For most other vessels, all 3 exams will coincide several times during the life of the vessel, affording Coast Guard marine inspectors the opportunity to conduct a complete assessment of the vessel's hull structure. The 3 distinct examinations also enable the Coast Guard to recognize the additional levels of safety inherent in specific vessel designs, such as a double hull tank barge with internally framed cargo tanks in fresh water service. These vessels have a 10-year DE interval, and 5-year intervals for both CTIE and ISE.

3. Concurrent Hull Examinations

It is intended, but not mandatory, that hull examination intervals, particularly those that fall between year 2 and year 3 of a 5-year interval, result in the examinations taking place concurrently with an inspection for certification, reinspection, or, in the case of tailshafts, a DE. If a vessel owner elects to conduct any one of the hull examinations early, then he should be advised that any other hull examination due at the same time should also be conducted early. The owner or master may, if operational commitments do not permit, decide to schedule an exam at a later date, provided that the exam is accomplished within the maximum time interval allowed by the regulations.

4. Extension of Hull Exams

Extensions of Hull Examinations

a. Hull examinations must be conducted in accordance with the applicable regulations, except in instances where extensions are authorized in accordance with subparagraph 8.A.4.d below. Any request for an extension of a hull exam must be submitted by the vessel owner or operator to the cognizant OCMI. To alleviate unwarranted extension requests, OCMIs should ensure that owners and operators are aware that Commandant (G-MOC) policy is not to grant DE extensions except in the most unusual circumstances. Examples of unusual circumstances are the sudden unavailability of drydock space (e.g., due to high river stage, weather damage to facilities, or of the scheduled drydock facility going out of business), the employment of the vessel where it cannot be replaced without risk, or circumstances clearly beyond the owner's control. Singularly, financial hardship is not a valid reason for granting a drydock extension.

Action Following Receipt of an Extension Request

b. Upon receipt of a request for extension of any hull examination, the OCMI should ascertain the condition of the vessel in question. A visit to the vessel is necessary in all but the most unusual circumstances. Prior to this visit, MSIS should be queried for any information on the vessel, and special attention should be paid to any outstanding requirements or casualty information that is available. While aboard the vessel, the inspector should interview the chief engineer and/or the master, as appropriate depending upon the class of vessel, to obtain their opinions on the condition of the vessel's hull, tailshaft(s), and associated machinery. In addition, a written statement shall be obtained from the chief engineer, or master, or both, attesting that the vessel is in suitable condition for operation during the period of extension requested.

NOTE: This requirement is in addition to the owner's written request for extension.

The inspector should then examine the vessel to the extent necessary to ensure that the condition of the vessel, first, is satisfactory for the extension requested in his or her opinion, and secondly, does not contradict the opinion of the master or chief engineer. The vessel's bridge record card, if applicable, should also be examined for any deficiencies that may have recently been issued by another port and not yet entered into MSIS.

Additional Considerations for Extension

c. A request for an extension of a hull exam must include not only an inspection of the vessel, but also take into consideration other U.S., international, and class requirements. Any conflicts with other requirements must be satisfactorily resolved before an extension request should be forwarded to Commandant (G-MOC) or granted by the OCMI per subparagraph 4.d below.

SOLAS

(1) International Convention for the Safety of Life at Sea (SOLAS). SOLAS requires an examination of the outside of a ship's bottom every 12 months on passenger vessels and at intervals not to exceed 5 years on all tankers. In addition, SOLAS requires that tankships 10 years of age and over undergo an examination of the outside of the bottom at the required intermediate survey, which may take place between 6 months before and 6 months after the midpoint of the period of validity of the Cargo Ship Safety Construction Certificate. No extension of a Cargo Ship Safety Construction Certificate is possible beyond 5 years.

Load Line

(2) Load Line Regulations (46 CFR 42). The Load Line Regulations require a vessel to be drydocked before issuance of a new Load Line Certificate and then every 5 years thereafter. An existing Load Line Certificate may be extended up to 150 days maximum, except for those vessels with Great Lakes Load Line Certificates, which can be extended for up to 365 days. (Until MSM Volume IV is updated, see MSM II-E4 for policy on load line extensions.)

Tailshaft Examination

(3) The tailshaft examination requirements of 46 CFR 61.20-17 through 61.20-23 and MSM II-B3.D provide regulatory and policy guidance regarding tailshaft examinations. A tailshaft examination extension may also require consideration if a drydock examination extension may also require consideration if a drydock examination extension will delay the tailshaft exam.

Delegation of Extension Authority

d. The Commandant has delegated to OCMI's and district commanders limited authority to extend hull examination intervals for certain specific vessels as follows:

Tank Barges, Not Gas Freed and Not In Service

(1) Under current industry needs, a large number of tank barges with current Certificates of Inspection (COI's) and not gas freed, have been laid-up for indefinite periods. The OCMI is authorized to grant consecutive 12-month extensions of hull examinations for laid-up tank barges, not to exceed a total of 4 years from the original drydock due date. Each extension shall be subject to the following:

(a) The barge must maintain a valid COI, including reinspections;

(b) In addition to the requirements of 46 CFR 35.05-15, the barge must be boarded and checked for damage and/or cargo tank integrity at least once a week by an owner's representative;

(c) A Form CG-835 shall be issued requiring the barge to undergo all required hull examinations prior to being placed in service, with an expiration date to coincide with the expiration date of the COI; and

(d) At the end of the fourth lay-up extension, the barge must undergo all required hull examinations and associated repairs made, or its COI must be surrendered.

NOTE: The barge must be gas free prior to the surrender of the COI.

Extension of the CTIE (Gravity Tanks Only) and ISE

(2) Extension of the CTIE

(a) At the owner's request, OCMI's may grant two 12-month extensions to all vessels that require these exams to effect coincidence with a regularly scheduled DE. In most cases, 24 months should be a sufficient period of time to attain alignment. If a gap of more than 24 months exists between the next CTIE, ISE, and DE due dates, then an effort should be made to conduct either the CTIE or the ISE, or both, early to align them with the DE interval. Prior to granting an extension, an external exam should be made of the barge, including an exam from topside of all wing voids and rakes. This exam should be of sufficient scope that the OCMI is satisfied that the CTIE and ISE can be delayed for 12 months.

(b) Once harmonization of the DE, CTIE, and ISE intervals is achieved, further extensions of the CTIE and ISE longer than 3 months should not be necessary and should not be considered, except in those cases where unusual circumstances exist, e.g., those beyond the control of the owner.

(c) When an exam is completed following a 3-month extension, the examination completion/credit date shall be back-dated to its original due date in order to keep future hull exams in phase with the DE interval.

Subchapter "O" Gravity Tanks Carrying Those Products With a "G" in the Last Column of Table 151.05

(3) The cargo tank internal inspection intervals in 46 CFR 151.04-5(b)(1) and (2) and the cargo tank external inspection interval in 46 CFR 151.04-5(c) may be extended as follows:

(a) The 2-year cargo tank internal inspection interval for single hull barges and internally framed gravity tanks on double hull barges in 46 CFR 151.04-5(b)(1), and the 4-year cargo tank internal inspection interval for externally framed gravity tanks in 46 CFR 151.04-5(b)(2), may be extended to coincide with the appropriate CTIE interval specified in Tables 31.10-21(a), 31.10-21(b), 91.40-3(a), and 91.40-3(b).

(b) The 2-year cargo tank external inspection interval in 46 CFR 151.04-5(c) (applicable to both single hull, internally and externally framed double hull tank barges, and single hull barges with independent tanks) may be extended to coincide with the appropriate ISE interval specified in Tables 31.10-21(a), 31.10-21(b), 91.40-3(a) and 91.40-3(b).

(c) The policy in subparagraph MSM II-B3.A.4.d.(2) above is also applicable to these tanks carrying "G" products.

AUTHORITY RESTRICTION NOTICE: This cargo tank internal and external exam extension authority is only for those products carried in gravity tanks for which Table 151.05 refers to 46 CFR 151.04-5(b) for CTIE intervals (those products carried in gravity tanks with a "G" in the last column of Table 151.05).

Externally Framed Cargo Tanks on Double Hull Tank Barges

(4) OCMI's are provisionally authorized to extend the CTIE intervals from 5 to 10 years on double hull barges that are externally framed with the exception of the deck (see the definition for externally framed cargo tanks in subparagraph MSM II-B3.B.6.d.(2). OCMI's shall report to Commandant (G-MOC) any significant findings regarding under deck framing in both externally framed tanks examined at the 10-year interval, when authorized, and internally framed tanks examined at the 5-year interval.

Fuel Oil Tank Examination

(5) Fuel oil tank examinations are required at 5-year intervals during an ISE. If an ISE extension is granted per subparagraph MSM II-B3.A.4.d.(2) above, the fuel oil tank exam should likewise be extended.

Small Passenger Vessels

(6) OCMI's may grant DE extensions for T-Boats for a period up to a maximum of 1 year once applicable procedures under subparagraph MSM II-B3.A.4.b above have been met.

Mobile Offshore Drilling Units (MODU's)

(7) DE Extensions for MODU's

(a) Upon completion of the procedures under subparagraph MSM II-B3.A.4.b above, OCMI's may grant DE extensions for a period up to a maximum of 6 months, and district commanders may grant a second 6-month extension. The maximum period of time that a DE interval may be extended is 12 months.

MODU's in Lay-Up

(b) District commanders may grant extensions of exam intervals beyond 3 years for laid-up MODU's provided that a current COI is maintained and a letter attesting to the safe condition of the unit is submitted by the owner or operator. A Form CG-835 should be issued extending the DE and/or special underwater intervals until such time as the unit is either returned to service or the COI expires. In no case should the expiration of the Form CG-835 be beyond the expiration of the COI. The Deficiency letter shall require the vessel owner to conduct the appropriate exam prior to returning the vessel to service, or renewing the COI, whichever occurs first.

Great Lakes Vessels

(8) The Commander, Ninth Coast Guard District is authorized to grant DE extensions for Great Lakes vessels under the following guidelines:

(a) Extensions shall not exceed 90 days; and

(b) Extensions should be considered on a ship-by-ship basis and will be based on the results of a non-credit ISE, the extent of which should be to the satisfaction of the Commander, Ninth Coast Guard District.

Inland Passenger Vessel Special Drydock Extension Criteria

(9) Drydock extensions of up to 30-months are available to inland passenger vessels that operate in a benign environment, on restricted routes, upon successful completion of a special drydock extension survey. The survey criteria outlined below is similar to the traditional underwater survey program presented in NVIC 1-89 with exception that it is more detailed and comprehensive.

(a) Eligibility Criteria.

(i) The following criteria shall be met for any passenger vessel (inspected under 46 CFR Subchapter H, K, or T) requesting a drydock extension beyond one year:

- The vessel must be constructed of steel or aluminum. Wood and FRP hulls are excluded from eligibility.
- The vessel must have operated exclusively in fresh water since its last drydock examination. To further clarify, this means year-round operation in fresh water.
- Vessel operation must be restricted to rivers or protected lakes. This restriction must be indicated on the vessel's Certificate of Inspection. The definition of a protected lake will be left to OCMI discretion.

- The vessel must operate exclusively in shallow water or within 0.5 NM from shore. For shallow water operation, the maximum water depth may be defined as the depth at which, if the vessel sinks, the uppermost deck(s) that could safely accommodate all passengers and crew remains above water. To make this determination, vessel stability (passenger heeling moment) must be considered.

NOTE: Water clarity is not included as a condition of eligibility. If water clarity is a problem, then the use of a "clear box" of at least 18 inches in diameter must be used for the underwater video.

(ii) The cognizant OCMI will determine eligibility for drydock extensions. In addition to the above criteria, decisions of acceptability will be based on:

- The overall condition of the vessel (based on inspection history) and the hull protection system (cathodic protection is required as a minimum).
- The vessel's history of casualties involving the hull and other hull-related deficiencies.
- Review of the written extension request (see Section 2 below for details).

NOTE: Although a vessel age limitation has not been included as a criterion, the OCMI shall consider the impact of vessel age on the overall condition of the hull when determining vessel eligibility.

(iii) Unlike the traditional underwater survey program, a pre-survey drydocking is not required. Permanent hull markings, hinged sea chest grates, and reference videos are optional.

Drydock Extension Applications

(b) The information required for the drydock extension application is identical to the requirements for the traditional underwater survey program (see Section 2 of End. (1) to NVIC 1-89) with the following exceptions:

(i) Hull Maintenance and Condition Assessment Program. The extension request must include a hull maintenance and condition assessment program which shall, as a minimum, contain the following:

- A preventative maintenance plan for the vessel's hull and related systems/equipment. A preventative maintenance plan should consider the following:
- Inspection and replacement (as needed) of zinc anodes
- Inspection and cleaning (as needed) of the underwater hull
- Inspection and maintenance of rudder and shaft seals
- Inspection and operational testing of sea valves
- Flushing of sea chests and sea strainers
- Provisions for an annual condition assessment of the hull in the presence of a third party examiner. The third party examiner should be a qualified marine surveyor (recognized by a national marine surveyor association) or have prior experience as a Coast Guard marine inspector or classification society surveyor. As a minimum, the third-party examiner should have at least three years experience in the examination of steel or aluminum-hulled vessels. The OCMI shall have the discretionary authority to accept or deny the use of a particular third party examiner and may, as an option, require the presence of a marine inspector. The condition assessment plan should include the following:
- Evaluation of the vessel's underwater hull and appurtenances (using qualified divers and appropriate video equipment). This will be done primarily to verify that hull coatings remain intact and to check for fouling of hull appurtenances. This can also be used as an opportunity for preventative maintenance.
- Hull gaugings (representative sampling) of suspect areas.

- A mechanism for providing a written hull assessment and preventative maintenance report or checklist to the cognizant OCMI on an annual basis.

Internal Structural Examination

(ii) A thorough ISE shall be conducted during the survey. All internal spaces shall be made accessible for examination and gasfreed as appropriate. However, integral fuel oil tanks shall be examined as required by MSM, Volume II, Chapter 8.B.5. and by 46 CFR *71.53,* 115.610, or 176.6 10 (as applicable).

(iii) Vessels of 15 Years of Age or Older. Vessels 15 years of age or older are eligible for drydock extensions under this policy.

Preparatory Meeting

(c) Preparatory Meeting. Before conducting the drydock extension survey, a preparatory meeting shall be held. See Section 4 of Encl. (1) to NVIC 1-89 for details.

Survey Criteria

(d) Survey Criteria. The drydock extension survey shall be conducted in accordance with Section 5 of End (1) to NVIC 1-89, with the following additions or modifications:

(i) Duration of the Drydock Extension Survey. The survey should take as long as the inspector considers necessary to ensure that the ship is in a safe condition to continue operation for the next 30 months. At least five days should be allowed to conduct the examination. However, with use of a third party examiner, the marine inspector's time on-site may be reduced. With the exception of those portions of the survey that require marine inspector presence, the duration and scope of participation by a marine inspector shall be subject to OCMI discretion.

(ii) Site Selection. The site must be in an area with sufficient water depth under the keel and sufficient clearance adjacent to both sides of the vessel to allow the diver to safely survey the entire underwater hull of the ship. Current velocity must be minimal to ensure diver safety. If air temperatures are below freezing, dive equipment must be designed for use in sub-freezing conditions. Diving should not take place when ice exists on the water surface.

NOTE: Water clarity is not a great concern because use of a "clear box" will enable a clear, albeit limited, view of the hull regardless of water conditions.

Hull Markings

(iii) If permanent hull markings as required by NVIC 1-89 are not in place, a temporary underwater grid system shall be used. The temporary grid system shall consist of stainless or galvanized steel cables, spaced not more than 10 feet apart, with sequentially numbered tags spaced at one-foot intervals. The grid system shall remain in place during the entire survey.

Preliminary Examination

(iv) Prior to holding the preparatory meeting as noted in Section 3 above, a third-party examiner (acceptable to the OCMI) together with qualified divers shall conduct a preliminary examination of the hull. The preliminary examination shall be used to assess the overall condition of the vessel hull and identify specific concerns that should be addressed. A marine inspector need not be present during this portion of the survey process.

Underwater Inspection

(v) A complete underwater hull examination (as defined below) shall be supervised by the third-party examiner and recorded on videotape. The third-party examiner will identify areas requiring further examination by a marine inspector. The videotape will be indexed to enable the marine inspector to readily identify and review important sections of the tape.

As a minimum, the underwater survey shall include a general examination of the hull plating and a detailed examination of all hull welds, propeller, rudder, other hull appurtenances, sea chests, and sea valves. As a guide, examination of the hull plating should cover all welds and at least five points on each plate, evenly spaced, where ultrasonic gaugings will be taken. The plugging of sea chests and gauging of rudder and tailshaft bearings shall also be recorded on videotape. The attending marine inspector may require a detailed examination of other areas of the hull as deemed necessary.

In addition to the above gaugings, divers shall take belt gaugings at the bow, stern, and midships and along the wind and water strake. The number and exact location of belt gaugings will be subject to OCMI discretion.

A Coast Guard marine inspector shall be present during critical portions of the underwater survey process. Critical portions would include, as a minimum:

- Examination of critical welds (identified at preparatory meeting), propeller, rudder, other hull appurtenances, sea chests, and sea valves.
- Plugging sea chests and removal of sea valves.
- Gauging of rudder and tailshaft bearings.
- Any other portions identified by the OCMI.
- Sea valves shall be removed and examined in accordance with the guidance contained in NVIC 1-89. The OCMI must be completely satisfied that sea valves can be removed safely. **Passengers must be removed from the vessel during this evolution.**
- It must be stressed that this special drydock extension program is an option that the vessel's owner/operator has elected to use. Responsibility for the management of the vessel, its personnel, and maintenance of necessary safety and service systems remains at all times with the master and owner/operator.
- The vessel owner will provide the OCMI with a detailed examination report including a gauging report, bearing clearances, and a copy of the videotape.

Underwater Inspection Techniques and Equipment

(vi) Underwater Inspection Techniques and Equipment.

Underwater inspection techniques and equipment shall be in accordance with Section *5* of End. (1) to NVIC 1-89.

If water visibility will affect the quality of the underwater video, the video camera must incorporate use of a "clear box". A clear box is a device which uses clean, fresh water to displace the surrounding water and provide a clear view for the camera. In order to provide an adequate field of view, the clear box must measure at least 18 inches in diameter (or, if rectangular, at least 18 inches in height and width).

As a general rule, modern video and audio equipment shall be used to assure the best quality results.

Internal Structural Examination (ISE) and Integral Fuel Oil Tank Examination

(vii) Internal Structural Examination (ISE) and Integral Fuel Oil Tank Examination.

A complete 1SE shall be conducted as part of the drydock extension survey. All internal areas of the hull must be accessible for examination.

The marine inspector must conduct the entire ISE. The third-party examiner or a suitable representative will accompany the inspector to take additional hull gaugings. The extent of internal gaugings should be limited to that necessary to confirm the information gathered during the underwater survey.

Integral Fuel oil tanks shall be examined as required by MSM II-B3.B.5. and by 46 CFR 71.53, 115.610, or 176.610 (as applicable).

Acceptable Underwater Repairs

(viii) Acceptable Underwater Repairs. The acceptance of underwater repair proposals and the actual repairs will be subject to OCMI discretion. Repairs using underwater welding shall be subject to periodic reevaluation at subsequent inspections. Such repairs shall be completed in accordance with the standards found in the American Welding Society's, "Specifications for Underwater Welding". The OCMI may require immediate drydocking of the vessel if an underwater repair proposal or the actual repairs are considered unsatisfactory.

Evaluating Results of the Survey

(ix) Evaluating Results of the Survey. The OCMI may require drydocking of the vessel at any time if not satisfied with the results of the drydock extension survey.

Administrative Procedure

(e) Administrative Procedure. If fully satisfied with results of the survey, the attending marine inspector may recommend a drydock extension of up to 30 months.

(i) The drydock extension policy contained in MSM II-B3.A.4 shall be followed for administrative purposes. Based on results of the survey, the OCMI may recommend a drydock extension of up to 30 months.

(ii) Each completed application and survey, with the OCMI's recommendation, shall be forwarded to Commandant (G-MOC), via District, for action. Commandant (G-MOC) has final approval authority for drydock extensions submitted in accordance with this policy.

(10) Tank Vessels, Tank Barges, And Freight Vessels. District commanders may grant DE interval extensions for these vessels under the following guidelines:

(a) The extension period shall not exceed three months. DE extensions beyond three months may only be granted by Commandant (G-MOC). Requests for all extensions shall be forwarded with recommendations to the appropriate office, via the chain of command.

(b) In all cases where an extension is granted (except for Great Lakes vessels), the extension date will be the new drydock base date. That date will be back dated to the actual DE due date.

(c) In all cases (except for DE extensions for 30 days or less), a pre-drydock extension examination will be conducted by the OCMI to ascertain the material condition of the vessels. OCMI recommendations concerning the DE extension request shall be forwarded with the DE extension request for further consideration.

Guidance for Drydock Examination Interval Extensions

(11) The revised drydock regulations require that certain vessels in salt water service be examined on drydock twice within <u>any</u> five year period, with no more than three years between any two examinations. This requirement prevents a vessel from ending a five year drydock period with a three year interval between dockings and beginning the next period with another three year interval. The vessel owners attempting to do so have misinterpreted the requirement to drydock their vessels twice within <u>any</u> five year period.

Extensions to Drydock Examination Intervals

(12) Extensions to drydock examination intervals will not normally be considered, except under unusual circumstances. Examples of unusual circumstances are the sudden unavailability of drydock space (e.g., due to high river stage, weather damage to facilities, or the scheduled drydock facility unexpectedly going out of business), the employment of the vessel where it cannot be replace without risk, or circumstances clearly beyond the owner's control. Singularly, financial hardship is not a valid reason for granting a drydock extension. Requests for drydock examination interval extentions forwarded to Commandant (G-MOC) should be sent via the chain of command with endorsements that provide recommendations. The recommendations made by the Officer in Charge, Marine Inspection (OCMI) and the District (m) officer are necessary to properly evaluate the request. Every effort should be made by the OCMI to ascertain and indicate the material condition of the vessel in question.

Administering Extensions

e. If an extension is granted, it should extend the affected exam to no later than the date to which the extension was requested, or shorter if necessary to meet other requirements discussed above. MSIS shall be updated accordingly to reflect the extension dates. If the OCMI deems it appropriate, the COI should be reissued with a statement under "Conditions of Operations" reflecting that hull exams have been extended.

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5. Documenting Fresh Water Service

a. For vessels that qualify, or desire to qualify, for fresh water DE intervals, the OCMI should require whatever documentation considered necessary to ensure that only those vessels qualifying for a fresh water exam interval are receiving it. Upon acceptance of satisfactory documentation of fresh water service, the OCMI should allow a longer DE interval as provided by the regulations for fresh water service and amend the COI accordingly. The vessel's service should be evaluated annually for extensions up to the standard intervals allowed for fresh water service.

b. OCMI's may add a "Fresh Water Only" restriction to a Lakes, Bays, and Sounds route endorsement as an alternative to requiring letters that document fresh water service. These route restrictions should be made only at the request of the vessel owner. Due to the length and detail to which COI's have grown in recent years, lengthy route endorsements or restrictions to limit salt water exposure are discouraged.

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6. Impact of Lay-Up on Hull Examination Schedules

The following apply to vessels with a 2.5-year DE interval that are drydocked when they come out of a lay-up period:

a. A vessel for which the lay-up period exceeds 6 months is subject to the following criteria if more than 2 years have elapsed since its last drydocking:

(1) The hull exam cycle when coming out of lay-up will start anew with the re-activation hull exams. The next hull exam will be required between 2 and 3 years after the activation DE, the actual date being the owner/operator's choice.

(2) All hull examinations, i.e., DE, ISE, CTIE, underwater survey (if approved by the OCMI and applicable), and tailshaft exam, are included.

b. For a vessel coming out of a lay-up period of less than 6 months, where more than 3 years have elapsed since the last drydocking, the next required drydocking need not be less than 2 years.

c. Vessels coming out of lay-up periods of any length, but for which less than 3 years have elapsed since the last DE, shall be subject to the normal 2.5-year hull exam intervals.

B. CONDUCT OF HULL EXAMINATIONS

Vessel owners or operators are responsible for preparing the hull, through-hull fittings, shaft(s), propeller(s), rudder, tanks, voids, and other confined spaces, as appropriate, for any hull examination. This includes cleaning, disassembling, gas freeing, testing for toxicity, and ventilating. The inspector should normally conduct the examinations in the company of a vessel representative (port engineer, ship's officer, etc.), as well as any other interested parties or agencies (a classification society surveyor, an insurance underwriter, a shipyard representative, etc.). Whether accomplished in one visit or over a period of time, each particular exam should consist of a careful inspection of all accessible parts of the vessel's structure, fittings, and appurtenances, as appropriate. Deficiencies should be called to the attention of the owner's representative at once. When deemed necessary, the inspector should note requirements for correction of deficiencies on Form CG-835. Discussion of the vessel's condition and alternate methods of repair should result in adequate repairs with the least disagreement over methods and extent of repair. The marine inspector must be satisfied that the vessel can operate safely. In cases of severe damage, controversy, or unusual circumstances beyond the inspector's experience, the OCMI should be notified immediately.

1. References

Navigation and Vessel Inspection Circular (NVIC) 7-68, "Notes on Inspection and Repair of Steel Hulls," contains guidance on judging the condition of steel hulls and the repair of same. NVIC 1-63, "Notes on Inspection and Repair of Wooden Hulls," contains guidance on repair of wooden hulls. Inspectors shall be familiar with the recommended procedures in these NVIC's. MSM II-A5 contains inspection and repair standards for tank barges. Chapter 10 of volume I of this manual contains Coast Guard occupational safety and health policy for marine safety personnel. NVIC 5-82, "Fixed Ballast," contains guidance on permanent ballast tanks, corrosion inhibitors, test plates and ballast mediums.

2. Drydocking Exam for Credit

All vessels in drydock shall be cleaned and their fittings opened to the extent necessary for the inspector to determine the condition of the underwater body and fittings. Past casualties have indicated a need to examine fittings in the underside hull that might be hidden by keel blocks. When it is known that docking plugs are fitted in the hull, the inspector should ensure that they are viewed when the vessel is in drydock.

Drydocking in Excess of Requirements

a. Drydocking in Excess of Requirements. When a vessel is drydocked for repairs to the underwater body or fittings, or for other purposes in excess of the requirements for complete periodic inspections, an examination should normally be made by an inspector. This examination should be sufficient to determine that all repairs are adequate and that the vessel is safe for continued operation. If the owner or operator requests credit for a drydocking after the vessel has already been hauled out, a complete examination for credit should be conducted if the OCMI has the resources available to dedicate an inspector to the job. If the drydocking is not for full credit, the inspector should examine the underwater hull structure and fittings to the fullest extent practicable under the circumstances. In such cases, the degree of preparation and opening of fittings may be less in scope. This policy does not prevent the inspector from conducting such reasonable inspections, requiring reasonable cleaning or opening of fittings, as deemed necessary to determine that the vessels's condition is safe for continued operation. However, excessive or arbitrary requirements for the cleaning or opening of fittings are not desired.

b. Drydocking of "T-Boats." For vessels inspected under Subchapter T, an inspector need not attend every drydocking that is not for full credit. An inspector shall attend each of the periodic drydockings required by 46 CFR 176.15.

NOTE: 46 CFR 176.15-10 does not contemplate examination by the inspector when T-boats are drydocked for minor repairs, such as changing a propeller, painting, or cleaning.

3. Internal Structural Exam (ISE)

The ISE requirement is in addition to the statutory requirement to determine the suitability of the hull structure at the time of a vessel's COI, as required per 46 U.S.C. 3305 and 3307. The scope of an examination of the vessel's structure during an inspection for certification that does not include a DE is left to the discretion of the OCMI. It is intended that the results of the more recent ISE's be used by an OCMI when assessing the suitability of the structure for the intended service at the time of certification. This concept is not new and has essentially been applied anytime a COI was issued as the result of an inspection that did not include a drydocking.

4. Cargo Tank Internal Exam (CTIE)

The scope of this exam consists of an examination of the internals of all cargo tanks, including but not limited to framing, piping, sounding devices, closure devices, and all attached appurtenances. This exam does not extend to pressure vessel type cargo tanks, which are being addressed in a separate regulatory project.

5. Internal Examination of Integral Fuel Oil Tanks

In order to promote safety and to comply with the recommendations of the National Transportation Safety Board (NTSB) resulting from the sinking of the GLOMAR JAVA SEA, the internal examination of integral fuel oil tanks is now required.

a. Timing. The fuel oil tank examination intervals are structured to permit alignment with the similar Load Line requirements (46 CFR 42.09-15) and the American Bureau of Shipping (ABS) special survey standards (e.g., our regulations require ABS third special survey standards to be met by vessels 10 years of age or more but less than 15 years of age). This 5-year window, and other similar windows, will enable vessel owners to schedule fuel tank examinations as required with the vessel's ISE, or to coincide with the DE if desired.

b. Selection of Tanks to be Internally Examined. As with the ABS Rules, the mandatory internal inspection of a representative sampling of fuel oil tanks only applies to double bottom tanks. Integral non-double bottom fuel oil tanks need not be cleaned out and internally examined if the marine inspector is able to determine by external examination that the general condition of the tanks is satisfactory. When selecting those tanks to be internally examined, due consideration should be given to the results of the external fuel oil tank examination as well as previous inspection records to ensure that, as appropriate, a variety of tanks are entered during the life of a vessel.

6. Examination of Tank Vessels

Introduction

a. Introduction. Attention has been focused upon certain unsatisfactory conditions found on tankships as a result of casualties, information furnished through crew complaints, and individual examinations of vessels by Headquarters representatives. These include the following:

(1) Deteriorated underdeck and side shell longitudinals;

(2) Fractures in bottom transverses, bilge brackets, and web frames, particularly in areas where stress raisers are found, i.e., "notches" caused by rat holes, lap joints, square cutouts, and improperly radiused transitions;

(3) Severe general wastage of internals in tanks or compartments exclusively used for ballast or as cofferdams;

(4) General wastage by corrosion of deck piping, expansion trunks, and pipe brackets;

(5) General wastage and severe binding of the required remote control reach rods; and

(6) Deterioration of through hull fittings, spool pieces, and expansion joints.

Hull Examinations

b. The findings noted above, coupled with observations of the overall condition of several older tankers, indicate that the scope and caliber of inspections have occasionally been unsatisfactory. To ensure complete coverage of a vessel of any age during an inspection cycle, the scope of DE's, ISE's, CTIE's, underwater surveys, integral fuel oil tank examinations, inspections for certification, and midperiod inspections should be recorded as follows:

(1) The inspector should sign the "Remarks" section of form booklets CG-840A, CG-840H, and CG-840S, after indicating each internal compartment that was not examined and why; and

(2) Signed entries should be made on Form CG-2832, Vessel Inspection Record, indicating each internal compartment that was examined.

INSPECTION NOTE: Inspections of double bottom and other tanks and cofferdams should be carried out during internal structural examinations, although such spaces may be inspected during an inspection for certification, reinspection, or drydocking. In all cases, all gas-free compartments of ocean and coastwise tankships (with the exception of fresh water tanks) should be examined internally at vessel DE's, underwater surveys (if approved and applicable), ISE's, CTIE's, integral fuel oil tank examinations, inspections for certification, and midperiod inspections. If at the time of an inspection the OCMI is not satisfied that these compartments were examined during the previous inspection, an appropriate gas-freeing requirement should be made to permit such examination.

OCMI's should consult MSIS or contact one another to obtain appropriate records to ensure that internal compartments are examined as required.

In addition, the OCMI should take such steps as considered necessary to ensure that thorough examinations are made to detect the conditions described in subparagraph B.6.a above. Particular care should be taken to examine all structural members and areas subject to wastage by corrosion from cargoes or salt water.

Examination of Vessels Built with Reduced Scantlings (VLCC/ULCC)

c. Examination of Vessels Built with Reduced Scantlings (VLCC/ULCC).

(1) Introduction. Very large crude carriers (VLCC's) and ultra large crude carriers (ULCC's) present a unique inspection problem due to their size, lighter construction, and susceptibility to corrosion. Experience has shown that vessel age is a much more important factor for inspection of VLCC's than for a conventional tanker. Vessels built to reduced scantling standards should have a special notation on their COI. These vessels have less corrosion allowance and are required to have tank coatings as a condition of construction. The proper use of thickness gauge readings and inspections of tank coatings and corrosion control systems are therefore very important. Accelerated corrosion loss has been prevalent in cargo/dirty ballast tanks, flume openings, and bottom shell plating. Crude Oil Washing (COW) has also presented localized wastage problems due to direct impingement of crude and cleaner on surfaces. Tank coating conditions will be noted in the inspection diary, and coating restoration will be required if existing coatings have failed.

(2) CTIE. The size of cargo tanks on ULCC's and VLCC's present a special problem in the examination of underdeck structural members. Methods of conducting an inspection have included rafts, high-powered lights with binoculars, special cranes, and catwalks. Although enhanced special surveys require “close up” inspections, conventional climbing about with a flashlight or staging methods are neither safe nor practical in larger cargo tanks. The method of tank inspection should be discussed and approved in advance of the vessel's scheduled inspection whenever possible. The raft method can be hazardous and should be conducted only with the OCMI's specific approval. Catwalks or other permanent in-tank structures may not be safe due to weakening from accelerated corrosion.

Tank Barge Examinations

d. Tank Barge Examinations

(1) General. The longer drydock intervals were established with the intent that the required intermediate ISE's would be thorough. It is imperative that a complete examination of internal framing, hull plating, and tank boundaries in the void and ballast spaces be conducted. The regulations allow an OCMI to require a vessel to be drydocked or otherwise taken out of service, if, during an ISE, damage or deterioration to the hull plating or structural members is discovered.

(2) Externally Framed Tanks. The 10-year CTIE interval permitted for double hull barges with externally framed gravity cargo tanks is applicable to those tanks that are externally framed on both ends, both sides, bottom and top. Double hull barges with framed bulkheads in the cargo tanks, or with trusses, girders, or stanchions in the cargo tanks, qualify for the externally framed intervals as long as the exterior cargo tank envelope is externally framed (all 6 sides). In addition, on an interim basis pending inspection results per subparagraph A.4.d.(4) above, double hull barges that are externally framed with the exception of the deck shall be considered to be externally framed. This policy shall be applied to all Subchapter D and I double hull barges, and to those carrying Subchapter O products that have a "G" in the last column of Table 151.05.

7. Examination of Permanent Fresh Water Ballast Tanks

Ballast tanks containing permanent freshwater ballast may be exempted from internal inspection under the following conditions:

a. The ballast fluid shall be chemically tested to ensure that its corrosion inhibiting properties are still effective. The test sample shall be taken from mid-depth in the ballast tank.

b. The corrosion test plate shall be examined to ensure that the ballast tanks are free of corrosion.

c. An external examination of each ballast tank, to include bottom shell plating, tank top, and all internal structural members that constitute the exterior of the ballast tank, shall be conducted to the extent practicable, to determine the external condition of the ballast tank.

INSPECTION NOTE: When significant corrosion is found, structural damage is evident, or the permanent ballast medium is determined to be inadequate, the OCMI may require that the subject tank be made gas-free (if necessary) and available for internal inspection.

C. UNDERWATER SURVEYS INSTEAD OF ALTERNATE DRYDOCK EXAMINATIONS

In December 1980, the Coast Guard published the final report of a research project entitled "1980 Underwater Technology Survey for Extension of Time Between Drydockings" (National Technical Information Service (NTIS) Report ADA 101-131). The report indicates that current technology, properly applied with additional administrative and operational controls, can provide a satisfactory means of inspecting the underwater bodies of vessels without their being hauled out. Underwater examinations using video equipment have been accepted on occasion by the Coast Guard as a means of verifying the continuing acceptability of the structure of large MODU's since 1969. Since publication of 46 CFR 107 in 1978, underwater examinations for column-stabilized and self-elevating MODU's have been allowed by regulation. The revision of the drydock and tailshaft regulations in 1988 provide the option of alternating DE's with underwater surveys to owners and operators of tank vessels, cargo and miscellaneous vessels, and oceanographic research vessels, less than 15 years of age, and also permit continued participation in the underwater survey program for vessels 15 years of age and older. Vessels older than 15 years of age which have not previously participated in the underwater survey program are ineligible.

1. Entry into Underwater Survey Program

Pre-Survey Drydocking

a. Pre-Survey Drydocking. An owner who desires to enter his vessel into the underwater survey program must first drydock the vessel. The purpose of this drydocking is to conduct a preliminary survey of the hull to evaluate its condition and the feasibility of conducting an underwater survey. This survey and the video discussed in subparagraph C.1.d below are to be used as a reference for the first underwater survey once the vessel has been approved for the underwater survey program.

Hull Markings

b. Hull Markings. During the pre-survey drydocking, a means must be provided whereby the location of the diver relative to the hull can be determined with sufficient accuracy to locate specific points on the underwater body. This may entail a weld bead grid system on the hull, a contrasting color coating system, a movable grid, an acoustic "pinger" locating system, or any other arrangement that is satisfactory to the OCMI. Hull markings, or "targets," every 100 feet, at the keel, below the turn of the bilge, and below the water line are recommended. Consideration should be given to the possibility that bottom coatings alone may wear off over time.

Sea Chests

c. Sea Chests. Hinged gratings must be installed on all sea chests to allow divers access into each sea chest to inspect the external sides of through hull connections and sea valves.

Reference Video

d. Reference Video. Once all hull markings and preparations have been made, a video tape with audio commentary shall be made of all external areas of the underwater hull, including rudder, propeller(s), tailshaft(s), hull protective system, and all other attached appurtenances. The video is to clearly show the hull reference markings.

2. Applications for Underwater Surveys Instead of Alternate Drydock Examinations

Applications for underwater surveys should be submitted to the cognizant OCMI at least 90 days before the requested survey. In addition to the information required by the applicable sections of the CFR cited in section C above, the following information should also be included with each application:

a. Identity of the diving contractor;

b. Number of divers to be employed, type of diving equipment to be used, and their underwater nondestructive testing (NDT) and damage repair capabilities;

c. Means of waterborne diver support;

d. Means of taking rudder bearing clearances;

e. A letter signed by the vessel's master, chief engineer, or the person in charge, stating the general overall condition of the vessel, level of maintenance, any known or suspected damage, cleanliness of the underwater body, and the anticipated draft of the vessel at the time of the survey;

f. The number of additional or vessel personnel that will be available to assist the dive team and Coast Guard marine inspector in conducting the underwater survey;

g. The anticipated duration of the underwater survey (experience indicates that at least 5-10 days should be allowed); and

h. Whether or not ISE, CTIE, and integral fuel oil tank exams as required will be conducted concurrently with the underwater survey.

3. Applications for Continued Participation in the Underwater Survey Program by Vessels 15 Years of Age and Older

Requests to continue in the underwater survey program for those vessels which will be 15 years of age or older at the time of the next underwater survey must be submitted to Commandant (G-MOC) via the cognizant OCMI at least 90 days before the drydocking preceding the underwater survey. This advance notice, which would be 3 to 5 years in advance of the requested underwater survey, is intended to ensure that a thorough assessment of the vessel is made during the drydocking preceding the underwater survey, with an eye towards the vessel's suitability to go twice the drydock interval between actual haul outs. Additionally, it will ensure that a complete set of suitable hull gaugings is taken. A complete set of hull gaugings is considered to be all of the gaugings deemed necessary by the OCMI to determine the condition of that particular vessel's hull. They should include as a minimum gaugings taken around two or more complete transverse sections of the hull. Plate gaugings of one or more strakes in the wind and water area, of additional transverse belts, or of questionable areas such as those with heavy pitting or fractures, may also be required. The results of the drydock examination and the hull gaugings, together with the OCMI's recommendations, shall be submitted to Commandant (G-MOC) for final determination of whether the vessel may remain in the underwater survey program.

4. Preparatory Meeting

The Coast Guard inspector, a shipowner's representative, and a member of the diving team should conduct a preparatory meeting prior to the underwater survey to discuss the details of the survey. In the case of overseas surveys, every effort should be made to hold this meeting before the inspector proceeds overseas. At this meeting, the duration of the survey, the site selection, the diver's equipment, personnel and operation, hull cleanliness and preparation, extent of internal examinations, route of the survey along the vessel's bottom, and the overall conduct of the survey should be discussed. In addition, the inspector will be able to advise the shipowner's representative and the diver of all the items the inspector intends to inspect during the underwater survey. Additional items may need to be surveyed depending upon the actual conditions found aboard the ship during the survey.

5. Conducting the Survey

The following guidelines have been developed based upon Coast Guard underwater survey experience, the NTIS report, and the ABS Guide for Underwater Inspections in Lieu of Drydocking Survey, 1975:

General

a. General. As a minimum, an underwater survey should include a general examination of the hull plating and a detailed examination of all critical welds, propeller, rudder, other hull appurtenances, sea chests, and sea valves. Detailed examination of other areas should be conducted as considered necessary by the inspector. It must be stressed that the underwater survey program is an option that the ship's owners/operators have elected to use. Responsibility for the management of the vessel, its personnel, and maintenance of necessary safety and service systems remains at all times with the master and his representatives.

Duration of the Underwater Survey

b. Duration of the Underwater Survey. The underwater survey should take as long as the inspector considers necessary to ensure that the ship is in a safe condition to continue until the next DE (up to 3 years for salt water service and five years for fresh water service). Previous experience indicates that at least 5 days should be allowed to conduct the underwater survey. However, if problems develop or repairs become necessary, more time will be required. Initial estimates of the duration of the underwater survey should be proposed by the owner in the application and either refined or confirmed during the preparatory meeting.

Site Selection

c. Site Selection. The location of the underwater survey is of the utmost importance for two major reasons. First, the site must be in an area with sufficient water depth under the keel and sufficient clearance adjacent to both sides of the vessel to allow the diver to safely survey the entire underwater hull of the ship, without concern for the presence of hostile sea life or high current velocities. Second, the site must have good underwater visibility. Conducting an underwater survey in poor visibility could adversely affect the intent of the program (equivalency to a DE) and the safety of the ship. Water turbidity (clarity) is a particularly subjective item, and the decision of acceptability should be based primarily on the clarity of the television monitor presentation. If the inspector feels that better visibility is required, the shipowner should be given the option of either moving the ship to a location with better visibility or drydocking the ship.

Additional Personnel

d. Additional Personnel. Current trends in automation and reduced staffing may result in a situation where a vessel's normal complement will not provide a sufficient number of personnel to assist in the inspection process and maintain the shipboard watch. Additional personnel may be needed to act as line handlers to support the dive boat, to position a movable grid if used, to pull sea valves, etc. Consideration should be given to crew watchstanding responsibilities when evaluating the need for additional personnel.

Divers, Diving Equipment, and Operations

e. Divers, Diving Equipment, and Operations.

(1) General. The underwater survey should not be conducted unless the inspector is satisfied that the equipment and procedures being used by the divers will provide a safe and meaningful examination of the ship. Safety must be foremost on the minds of all those working together on the actual diving operation. While matters in this regard are best left to the experienced, professional individuals normally found conducting this type of work, everyone involved in the survey should be alert to these needs and ensure that any requirements regarding this inspection can be safely accomplished.

Acceptability of Diving Personnel and Equipment

(2) Acceptability of Diving Personnel and Equipment. A professional commercial diving firm should be employed by the owner. While specific approval is not required by the Coast Guard, a subjective evaluation by the OCMI or the attending inspector should be conducted. Such an evaluation may consider the following:

(a) Prior experience or training.

(b) Qualifications of dive team members in photography, NDT, underwater damage repair, and other training and experience.

(c) The type, quality, and condition of equipment to be used, i.e., a color monitor and color tape video recording system is required along with two-way recorded audio between the diver and the inspector. A still underwater photographic capability must also be available.

(d) The degree of professional approach/attitude, as evidenced by an organized dive plan, personnel assignments, standbys and backups, compliance with appropriate safety regulations (Coast Guard, Occupational Safety and Health Administration (OSHA), various states).

Hull Preparation

f. Hull Preparation. The underwater survey should not begin until the inspector is satisfied that all areas of the hull to be inspected, including sea chests and sea valves, have been cleaned to allow for a meaningful examination. The method of cleaning is left to the discretion of the vessel owner. The inspector should review the reference video taken at the pre-survey drydocking to familiarize himself with the layout of the hull markings and overall condition of the hull at the time the recording was made. The internal examination (opening up) of sea valves may require diver installation of custom prefabricated blanks or watertight boxes on through hull fittings. Each hull opening to be blanked or plugged should be permanently marked or identified on the hull. This will simplify verification that blanks are inserted and removed from the correct hull openings. The ship should be at, or as close as possible to, its light draft.

Sea Valves

g. Sea Valves.

(1) Preparation. The preparation of the sea valves for inspection during an underwater exam is most critical, as it will affect the watertight integrity of the hull and the ability to keep essential machinery in operation. Prior to commencing the examination of sea valves, the vessel's personnel should develop and provide a detailed procedure which at a minimum includes the following:

(a) The number, type, size, and method of operating the sea valves to be opened;

(b) The disabling of automation features which might affect the sea valves being examined;

(c) Method of installing blanks/plugs for sea chests/valves;

(d) The sequence of valves to be blanked/opened should ensure that vital cooling systems, essential electrical service, and bilge and fire pumping capabilities are maintained;

(e) Closure of watertight doors;

(f) An emergency procedures plan; and

(g) Means of communication between the bridge, dive team and engineroom (direct communications via sound powered phones are preferred).

(2) Safeguards. Removing and examining sea valves while a vessel is afloat and while some portion of the machinery plant remains in operation is a situation not generally experienced by shipboard personnel. Of necessity, all involved personnel should maintain the highest sensitivity to problems which may start out small but could lead to more serious matters. Intentionally disabling some systems is not a typical operation and should be carefully controlled by the ship's personnel. Sometimes the failure of internal safeguards or other construction features can lead to pressure in piping systems thought to be de-pressurized. This condition can lead to lengthy delays while the cause is located and corrected. Points to consider are as follows:

(a) Interconnected sea chest vents that meet below the water line will subject both sea chests to sea pressure unless both sea chests are blanked simultaneously.

(b) Failure of check valves can pressurize secured systems. This would most likely occur in crossovers between main and auxiliary fire pump lines, main and auxiliary cooling systems, and crossovers to the sanitary systems from any other salt water system.

(c) Temporary "jumpers" installed to keep essential systems on line may defeat the designed system isolation.

(d) Pressurizing auxiliary and sanitary systems with full fire main pressure can damage equipment designed for low pressure service.

Bearing Clearances

h. Bearing Clearances. Readings of the propulsion shaft bearing and rudder shaft bearing clearance should be taken. These readings should be acceptable to the inspector as accurate and reliable. Otherwise, drydocking the ship may be necessary. Clearances should be compared with those obtained during the last examination and meet the standards set in 46 CFR 61.20-23.

ISE, CTIE and Fuel Oil Tank Exam

i. ISE, CTIE and Fuel Oil Tank Exam. These exams include an examination of the vessel's main strength members, including major internal framing, hull plating, voids, and ballast tanks. In most situations, the ISE should be conducted before, or at the same time, as the underwater survey. The results of the ISE should be used to identify those areas where a problem exists or is suspect. These areas should be given special emphasis when conducting the external underwater survey.

Repairs and Deficiencies

j. Repairs and Deficiencies. Any required repairs should be performed to the satisfaction of the inspector. Depending upon the magnitude of the repair or the number of repairs necessary, this may result in an unsatisfactory examination and require drydocking of the ship. Deficiencies that are not repaired, or are not considered severe enough to require repair, should be evaluated in conjunction with the overall results of the underwater survey in determining whether the ship should be allowed to operate a full interval until the next drydocking. If there is doubt as to whether a ship is in a sufficiently safe condition to operate a full interval until the next drydocking (up to 3 years for salt water service and 5 years for fresh water service), the ship should be drydocked.

Underwater Inspection Techniques and Equipment

k. Underwater Inspection Techniques and Equipment.

(1) General. The attending inspector will generally be limited to viewing the television (TV) monitor, reviewing video tapes, talking with the diver, observing NDT procedures, reviewing any still photos, and reading the diver's survey report. This method of survey does not generally lend itself to the flexibility and "hands-on" aspects marine inspectors have come to know at normal haul outs. Nevertheless, there are a number of things that can and should be prepared for. The diving operation will normally be a surface supplied air dive that includes the diver, a tender watching the diver's umbilical, a standby diver (usually the tender), and the diving supervisor. Communications with the diver should be via hardwire. The TV monitor should be located close to the diving supervisor's position to facilitate simultaneous viewing of the TV monitor and communication with the diver.

(2) Diver's Observations. The diver's visual findings and commentary can be very beneficial. A knowledgeable inspection diver can provide greatly enhancing detail and description to the TV monitor. For example, wiping off sea growth to clear a picture of weld or carrying a short ruler or a marked diving knife to give dimensions can be helpful to topside viewers. On the other hand, the camera used by the diver provides a small field of view. The view can be affected by water clarity, the diver's exhaust bubbles, the diver's motion and speed of advance, glare from the diver's light as well as the amount of available light, etc. The diver's comments on the overall condition of the hull regarding sea growth, damages, and the coating system may prove to be helpful, but the inspector should maintain control of the inspection by requiring the diver to proceed at a pace such that there is good visual acuity of the section of the hull being photographed. The inspector may also have to direct the diver to adjust the attitude of the camera to reduce glare or to bring an item more into focus. The measure of reliance upon such information is left to the judgement of the inspector at the time of the inspection and, ultimately, to the OCMI.

(3) Monitor System. A color TV system should be used. A color bar or test slate should be available to allow proper adjustment of the picture for maximum efficiency and clarity. This includes consideration for a compatible lighting system (type of light, candlepower, etc.). The monitor presentation should be satisfactory to the inspector/OCMI. It should concentrate on hull appurtenances (propellers, rudders, bilge keels, sea chests, etc.) as well as any areas of damage. Although it may not be necessary to cover every inch of every weld on the underwater body, the attending inspector/OCMI should be satisfied as to their satisfactory condition.

NOTE: The owner should provide a copy of the audiovisual tape and the written report by the diving company to the OCMI.

(4) Photography. Still photography, particularly 35mm, provides generally improved detail as compared to TV pictures. This is particularly useful in specific or localized applications such as damage or deformation. Its use is highly recommended when questionable areas are found on a hull.

(5) NDT Procedures. These may consist of the diver's visual examination, magnetic particle inspection, or ultrasonic testing. For crack detection or help in determining the extent of cracks, magnetic particle methods are available. For thickness gauging, ultrasonic testing is recommended. In any case, operators should be appropriately qualified and qualifications should be verified. Equipment calibration is likewise necessary.

Acceptable Underwater Repairs

l. Acceptable Underwater Repairs. Limited underwater repairs are possible, using newly developed techniques or materials. Some applications of welding, both wet and dry, below the water's surface are possible. Presently, any underwater weld should be considered a temporary repair, subject to reevaluation at subsequent inspections and haul outs.

Evaluating Results of the Survey

m. Evaluating Results of the Survey. The ship's operating schedule should not prevent the underwater survey from being conducted to the complete satisfaction of the inspector. If the OCMI is not completely satisfied with the results of the survey, credit should not be given for the survey.

D. TAILSHAFT EXAMINATIONS

1. Introduction

Periodic examinations of tailshafts are conducted to determine: (1) evidence of undue wear on the liner or bearing; (2) cracks in the shaft or liner; and (3) that the watertight integrity of the through-hull assembly (gland, bearing, and seals) remains satisfactory for continued service.

2. Inspection Standards and Applicability

The regulations which generally apply to ocean and coastwise vessels are 46 CFR 61.20-15 through 23. These regulations reserve all extension authority for the Commandant. That extension authority is delegated to the district commanders for certain vessels per subparagraph MSM II-B3.A.4.d.(9) above.

a. T-Boats. For these vessels, the regulations require only that the inspector examine the tailshaft and stern bearing to determine that they are in satisfactory condition.

b. Great Lakes Vessels. 46 CFR 61.20-23 applies only to vessels operating on ocean or coastwise routes. There are no comparable Coast Guard regulations for vessels operating on other routes. For these vessels, the standards in the ABS Rules for Building and Classing Steel Vessels may be used as a guide to determine the limits of weardown in the stern tube and strut bearings. The ABS Rules permit an additional 1/16" weardown for Great Lakes service when the shaft diameter is 12 inches or less, and an additional 1/8" weardown when the shaft diameter exceeds 12 inches. The ABS Rules may also be used in determining the limits of weardown for other vessels on inland routes, but they should not be applied as mandatory requirements for corrective action to be taken when these limits are exceeded or as authorization for weardown to reach these limits. Requirements for corrective action on inland vessels shall be determined by the OCMI, depending on the route, the diameter of the shaft, the type of bearing, and other safety factors involved.

c. Propellers Without Tailshafts. Thrusters and similar propulsion units without "in-line" shafts are not normally subject to tailshaft examination requirements (see MODU requirements in paragraph D.11 below).

3. Examination Intervals

Propulsion tailshafts are required to be drawn for examination at different specified intervals. These regulations allow different examination intervals for various criteria, such as the number of separate propulsion shafts; materials of fabrication; whether or not the shaft is exposed to saltwater; type of bearing lubrication; whether or not the shaft has "stress reduction properties"; type of bearing material; propeller-to-shaft connection; and whether or not the shaft has been previously repaired.

4. Examination Procedures

When a tailshaft is examined, special attention shall be given to detect fractures and wear in way of the taper, keyway, and liners. The stern bushing (after bearing) shall also be carefully examined, and replaced or rebushed if necessary. At every DE and underwater survey, the amount of wear in the after tailshaft bearing shall be determined. The inspector shall require corrective action to be taken on all vessels when: (1) the clearance exceeds the limits prescribed in 46 CFR 61.20-23 for ocean or coastwise vessels; (2) the condition of the bearing, shaft or liner is determined to be unsatisfactory; or (3) the wear is otherwise considered excessive. For oil bearings, the manufacturer's instructions for periodic maintenance and examination should be followed.

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5. Design Standards to Reduce Stress Concentrations

Generally speaking, there are several different factors recognized to reduce "stress concentrations" in tailshaft design. These include:

a. "Spooning" the forward area of the keyway;

b. "Slotting" the forward end of the key;

c. Locating the first keybolt "well back" from the forward end of the key;

d. Providing an "ample fillet" at the bottom corners of the keyway;

e. "Radiusing" the corners at the top of the keyway;

f. Providing a "hoop stress" groove for the liner; or

g. Using a gradual rise from the bottom of the keyway to the surface of the shaft and ending several inches back from the propeller hub counterbore. Also, a "keyless" design strives to eliminate stress concentrations. Regardless of design, the forward one-third of the taper remains a critical area to be examined for fractures.

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6. Tailshafts With Non-continuous Liners

To determine the interval at which a tailshaft must be drawn under 46 CFR 61.20-17, tailshafts that have a noncontinuous liner may be considered as having continuous liners, provided the liner sections are joined as follows:

a. The gap between the sections must be 1 inch or less; and

b. The connection between them must be made of vulcanized or synthetic rubber that is reinforced between layers.

7. Bearing Weardown

Weardown readings are used to give a general indication of any change in the clearance between the bearing and the shaft. For oil bath bearings, they are compared with the "original" readings that were taken when the bearings were installed or renewed. For water lubricated bearings, the weardown is either a measure of the total clearance between the bearings and the shaft (wood bearings), or the depth of the water groove (rubber bearings). Weardown readings should be taken so as to duplicate the original readings as much as possible. This includes the same measuring instrument and method, shaft location and loading, and even environmental conditions.

8. Water Lubricated Bearings

With wood or rubber bearings, "feeler" gauges of known thickness can be inserted between the shaft and the bearing to determine the amount of weardown. Weardown may also be taken on wood bearings with a small wedge. The wedge is inserted between the shaft and then removed. The impressed clearance is measured with a micrometer to determine the weardown. Maximum weardown readings for wood bearings are found in 46 CFR 61.20-23(a). Rubber bearings must be renewed when any water groove is found to be half its original depth.

9. Oil Lubricated Bearings

Experience has shown that oil bearing tailshafts rarely have problems unless they are disturbed. Drawing, shifting, or "bumping" the tailshaft requires the removal of bearing seals and increases the chance of scoring the tailshaft and bearings. Tailshafts with oil lubricated bearings need not be drawn for examination provided the provisions of 46 CFR 61.20-17(d) are met. Weardown readings should be taken and compared to previous readings, and the results of the required semi-annual lubricating oil analysis should be reviewed.

10. Strut Bearings On vessels with separate strut bearing arrangements, both the after stern tube bearing and the strut bearing need to be evaluated.

a. The after stern tube bearing should be evaluated for watertight integrity reasons. Weardown readings are normally taken. This portion of the tailshaft is not required to be shifted aft.

b. The strut bearing is of primary importance for evaluating the overall bearing wear and tailshaft condition. Although the tailshaft bearing weardown requirements in 46 CFR 61.20-23 refer to the "after stern tube bearing," the intent is to evaluate weardown at the aftermost bearing. The weardown requirements therefore apply to the after strut bearing.

c. Oil lubricated strut bearings may be examined without shifting the shaft aft under the equivalent inspection arrangement described in paragraph 8.D.9 above.

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11. Tailshafts on MODU's MODU's are provided an alternative tailshaft inspection procedure in 46 CFR 61.20-17. To meet the requirements of 46 CFR 61.20-17(c)(2), a MODU's tailshaft(s) should be examined during each underwater examination for credit. An examination procedure should be included in the special plan submitted by the vessel's owner in accordance with 46 CFR 107.265 or 107.267. During approval of special examination procedures, the OCMI may require any tests or examination requirements that are deemed necessary to ensure satisfactory condition of the tailshafts.

a. To examine wooden or rubber bearings, a hole in the top of the rope guard and a suitable wedge or gauge should be provided for checking the clearance. For oil lubricated bearings, means of ensuring that the oil seal is intact and for checking the stern bearing clearance should be provided. Maintenance records and a statement from the chief engineer should also be used to evaluate the condition of the tailshaft(s).

b. Tailshafts, seals, and bearings on MODU's, regardless of the vessel's propulsion designation (self-propelled, propulsion assisted, non-self-propelled), may be more significant to the vessel's overall safety from a flooding hazard viewpoint than as a loss of propulsion. Inspectors should evaluate the flooding potential of shaft bearings and seals as is done with other through hull fittings.

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12. Flanged Tailshafts with Propeller Coupling Bolts

The NDT of propeller flange bolts that may be exposed to corrosive environments is particularly important. The testing procedure and the operator's qualifications should be approved by the inspector. For bolt designs that are totally enclosed in oil (e.g., a Ross Turnbull bearing design), the NDT requirement of 46 CFR 61.20-18(c)(ii) may be waived, provided both a visual examination and oil sample analysis are satisfactory.

13. Oil Sampling

The increasing reliance on lubricating oil analysis to detect early seal failure or bearing wear emphasizes the importance of proper sampling techniques. Oil samples should be taken in accordance with the bearing manufacturer's recommendations or at a minimum of once every 6 months. The sample should be taken from a low point in the system to catch any water or metal filings in the system.

14. Tailshaft Repairs

MSM II-A5 contains a discussion of welding repairs that is applicable to tailshafts.

E. RUDDER ASSEMBLIES

1. Rudder Stocks on C3 Freighters

Certain C3-type cargo vessels were fitted out with cast steel rudder stocks, with the stock cast integral with the upper palm. On some of these vessels, cracks have been detected just above the rudder stock palm, apparently due to the short fillet. In several cases, these cracks had progressed to the point where a complete fracture occurred. From available information, however, the incidence of fracture in these rudder stocks was not serious enough to warrant rejection of the design. During drydock inspections of this type of vessel, particular care shall be taken to determine whether fillet cracks have started in the forward end of the upper rudder stock palm assembly. If so, corrective repairs or replacement shall be required. Repairs can be made if the casting is of homogeneous structure. Unfortunately, this is generally not the case with wartime material. Replacement stocks should be of forged, rather than cast, material.

2. Pintle, Rudder, and Rudder Post Defects

a. Vessels Having Semi-Balanced Rudders (Without Rudder Posts).

(1) Case Histories. Generally, these are T2-type tank vessels, although the examinations described here should be conducted on all vessels having similar rudder arrangements. One vessel's loss of this type of rudder is believed to have resulted from fracturing of the lower pintle in heavy weather. The entire rudder below the rudder stock palm, the lower pintle, the pintle, and the pintle nut were missing completely; the upper pintle was bent. Another vessel having such a rudder assembly lost the rudder; investigation revealed that the lower pintle had broken off completely, just below the securing point.

(2) Inspection Requirements. In view of these casualties, when a pintle is found loose or is withdrawn for any other reason, it should be examined by magnetic particle testing or another suitable method, particularly adjacent to the sleeve and between the threads and the small end of the taper. During the drydock examination, the condition of the pintle bushings, sleeves, nuts, and locking devices should be carefully examined. The discovery of a loose pintle would certainly justify its removal for further examination and verification of proper fit. Finally, the arrangements of the pintle locking devices should be such that the pintle cannot work free (on a third vessel, the pintle was found to have backed off, leaving the nut held in place only by a clip welded to the rudder frame casting). It is essential for the nut to be positively secured, to preclude "turning" of the pintle.

Vessels Having Rudder Posts

b. Vessels Having Rudder Posts. Generally, these are C3-type cargo vessels, although the examinations described below should be conducted on all vessels having similar rudder arrangements. Fractures have been found on some of these vessels in the rudder post castings just above or below the gudgeons; similar fractures have been found in the rudder frame casting. In some cases, the fractures in the rudder posts extended from or into the core-hole closing plates on the after side of the rudder post. During drydock examinations, the rudder frame and rudder post castings shall be carefully examined at close range for possible fractures. When conditions are suspect, the rudder post casting should be drilled, about 6 inches above the welded joint, to determine if water has entered the rudder post. If so, or if fractures are evident in the vicinity of the rudder frame gudgeons, a part of the rudder side plating should be removed for examination of the cast rudder frame arms, to which the horizontal diaphragms are attached. Particular attention shall be directed to the casting at the midheight of the rudder.

F. SEA CONNECTIONS

1. General Care

The need for careful inspection of all sea connections and their attached fittings, while a vessel is drydocked or undergoing other inspection must be emphasized. In one instance, a 3-inch nipple spool piece on the sanitary sea chest of a government vessel wasted away undetected; a casualty costing nearly $1 mi1lion resulted from flooding of the vessel's engineroom. It is imperative for all sea connections to be examined thoroughly and determined to be in good condition, even if drydocking is required to accomplish this. Particular attention shall be directed to piping and fittings installed between sea valves and the sea.

2. Condenser Water Boxes

Case Histories

a. Case Histories. Investigation of one sinking determined that the outlet water box of the vessel's main condenser had ruptured. This resulted in a stream of water approximately 20 inches in diameter that flowed freely into the engineroom, at approximately 20,000 gallons per minute. The overboard and sea valves, 24-inch gate valves, each required 2 people to make 40-50 turns to close them; attempts to do so failed because of the rapidity of the flooding. Approximately 5 minutes after the water box had ruptured, the engineroom was abandoned with the valves closed only partially. The condenser water boxes had been opened and examined by ship's personnel only 6 weeks before this casualty; 8 months earlier, they had been painted over with apexior. The last inspection for certification had been made 16 months before the casualty. Neither crewmembers nor the inspector had noted any defects, and the condition of the water boxes was considered satisfactory at the time. Within a few months of this casualty, another vessel was inspected after complaints of a defective main condenser water box. The water box was found to be pinholed, and had 2 brass plate patches and a 20"x18"x16" cement patch. Both vessels were built in the 1940's; available records indicated that the water boxes had not been replaced since the vessels were put into service.

b. Inspection Requirements. Considering the age of such installations, it is essential for all condenser water boxes to be examined closely, at frequent intervals, both by ship's personnel and by Coast Guard inspectors. At all inspections for certification and midperiod inspections of cargo and tank vessels, the inspector should examine condenser water boxes externally for patches, temporary repairs, and other obvious defects. In addition, the inspector should ask the ship's personnel about inspections they have made and the conditions observed. When conditions so warrant, the inspector shall make internal examinations or tests to verify that the water boxes are in satisfactory condition, or to determine the extent of required repairs.

3. Nonmetallic Expansion Joints

A casualty to a rubber expansion joint in the main low-sea suction intake of a vessel resulted in flooding of the engineroom and the near loss of the vessel. The life expectancies of nonmetallic expansion joints depend upon their applications and the surrounding environments and the regulations require that these expansion joints be replaced within 10 years after installation. A complete internal examination should be made of nonmetallic expansion joints whenever they are available for inspection and when external visual inspections reveal wear or other signs of deterioration or damage. If an adequate external or internal examination cannot be conducted by the inspector, the expansion joint should be removed for inspection. Following are various problem areas associated with rubber expansion joints, their probable causes, and recommended repairs:

Leaks at the Flange

a. Leaks at the Flange. Retaining ring splits should be as close together as possible, and flat steel washers should be used on the bolts over the splits. The bolts should be tightened uniformly by moving alternately around the flange from bolt to bolt, until the rubber on the joint flange bulges slightly and uniformly between the steel retaining ring and the piping flange.

Cracks at Base of Arch or Flange

b. Cracks at Base of Arch or Flange. These are caused by unexpected pipe movements that put excessive stress on the joint, most commonly from initial misalignment at the time of installation, excessive pipe movement, improper anchorage, or failure to use control rods. If such cracks are severe enough to interfere with the integrity of the joint, it must be replaced after the cause of the damage has been corrected.

Ballooned or Otherwise Deformed Arches

c. Ballooned or Otherwise Deformed Arches. These indicate interior displacement of reinforcing rings or wire, usually because of higher-than-recommended pressures. The joint must be replaced after all working conditions have been checked and proper recommendations made.

Loose Outer Body Fabric

d. Loose Outer Body Fabric. A feeling of softness or looseness near the surface of the arch indicates a loss of adhesion between fabric plies. If plies have separated, the joint must be replaced.

Spongy Feeling of the Joint Body

e. Spongy Feeling of the Joint Body. This is caused by moisture penetration and deterioration of the fabric, usually from loose bolts or deterioration of, or physical damage to, the bolt hole sealant. Operating conditions should be checked and the joint replaced.

Hardness and Cracking of the Cover

f. Hardness and Cracking of the Cover. This is caused by exposure to extreme heat, chemical fumes, ozone, and other elements in service conditions. The joint should be replaced after the cause has been determined and corrected.

Cuts and Gouges in the Cover

g. Cuts and Gouges in the Cover. These are caused by careless handling or damage from tools. Repairs should be made after consultation with the manufacturer and notification of the OCMI.

G. CREDIT FOR DRYDOCKING IN FOREIGN YARDS

Occasionally, vessel owners request credit for foreign drydockings during which Coast Guard inspectors were not present. These requests are normally denied. However, in certain unusual cases, the Commandant has authorized an OCMI to grant extensions of time for making permanent repairs or credit for drawing of the tailshaft in a foreign yard. In the interest of safety, extensions are generally discouraged. Commandant (G-MOC) will consider crediting foreign drydockings in unusual cases, upon a written request from the vessel owner or the owner's representative. The request must include:

a. Evidence that the drydocking was performed due to an emergency, not for routine repairs, cleaning, or inspection; and

b. Documentary evidence that the vessel's underwater hull and fittings were in a satisfactory condition at the completion of the drydocking. Normally, a certified copy of the drydocking report should be submitted by the foreign government's inspector or the classification society to indicate the conditions found and any repairs made. Evidence that an inspection was requested, but an inspector was unavailable.

H. RECORDS OF DRYDOCKINGS

➔ See MSM II, Section A, Chapter 3 (MSMII-A3) for information on the forms and means of recording hull examinations.

I. CRITICAL AREA INSPECTION PLAN (CAIP) SURVEYS

General Hull examinations required as a part of a vessel's CAIP will be conducted as outlined in NVIC 15-91, NVIC 15-91**,** Change 1, and Section A, Chapter 5 and Section B, Chapter 4 of this volume.

CHAPTER 4: INSPECTION PROCEDURES APPLICABLE TO VESSEL TYPES, CLASSES, AND CATEGORIES

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A. SMALL PASSENGER VESSELS ("T-BOATS")

1. Introduction

The statutes relating to the inspection and certification of small passenger vessels are found in 46 U.S.C. 3301 et seq. The implementing regulations are contained in 46 CFR 175-187 (Subchapter T). The regulatory program for small passenger vessel inspection requires a realistic appraisal of the operational needs of this industry. Because of the many types of vessels and operations to be considered, it is not practical to develop regulations that cover all situations. Under Subchapter T, Officers-in-Charge, Marine Inspection (OCMI) are authorized to accept alternates or equivalents, and to grant departures from the regulations when circumstances so warrant. In the development of the T-boat regulations, the primary considerations were:

a. Ignorance or misunderstanding by most passengers of the hazards of the sea;

b. Overloading, fires, explosions, and marginal seaworthiness (these had caused several serious casualties on uninspected passenger-carrying vessels); and

c. The need for a means of ready escape and survival in case of casualty.

SPECIAL CONSIDERATION: In carrying out the T-boat inspection program, it can never be assumed that vessel owners or operators are familiar with Coast Guard regulations and procedures. Inspection personnel must communicate with them on a continuing, personal basis to explain requirements in detail. Experience has shown that after a vessel is inspected and requirements are understood, most of an owner's apprehension subsides and cooperation is enhanced. Reports of inspection for certification and reinspection should note all items that have required interpretations of regulations by the OCMI, the district commander, or the Commandant. Such items include equivalents, substitutions, non-approved equipment, nonstandard fuel tanks, variations from subdivision standards, etc. These notes will form the basis for comparison of installed items with regulatory requirements at subsequent inspections.

2. Application

a. Title 46 U.S.C. 3301(8) requires the inspection of small passenger vessels. Title 46 U.S.C. 2101(35) defines "small passenger vessels", and 46 U.S.C. 2101(21) and (21a) define "passenger" and "passenger for hire." These statutory definitions should be used in applying the inspection regulations.

b. There have been inquiries concerning application of the passenger vessel laws to vessels which are owned by a corporation. The specific questions related to the exemption in 46 U.S.C. 2101(21)(B)(v) and whether corporate owned vessels could ever be used only for pleasure. Each investigation into possible illegal passenger vessel operations must be evaluated based on the facts of that specific case. There are many corporate owned, documented vessels with pleasure as the only endorsement. Some of these vessels may be operating illegally by carrying passengers, however, most are undoubtedly legitimate corporate owned pleasure vessels.

c. Corporate ownership alone does not prove that the vessel was a small passenger vessel. If business was not conducted during the voyage (i.e. - carrying company employees as a morale incentive or bonus for performance) and no expectation of future business was anticipated (good will) from the voyage, the vessel should be considered as being operated for pleasure, and not as a small passenger vessel.

3. Inspection Standards

General

a. By statute, vessels less than 100 gross tons (GT) carrying more than 6 passengers unless exempted from inspection by 46 CFR 175.05-1, shall be inspected and certificated under Subchapter T (thereby referred to as "T-boats"). The regulations only apply to vessels carrying more than 6 passengers. Vessels carrying more than 150 passengers are subject to certain additional requirements contained in 46 CFR, Subchapters F, H, J, K and P, as determined by the OCMI. (Those vessels coming under Subchapter K classification are hence termed "K-boats").

Vessels Carrying Freight for Hire

b. A T-boat may carry freight for hire, provided that:

(1) None of the cargo is prohibited from carriage on passenger vessels under 49 CFR, Subchapter C (Hazardous Materials);

(2) Sufficient space is provided for the number of passengers carried;

(3) The vessel's stability is not endangered;

(4) The vessel is not overloaded;

(5) Passenger emergency escapes and access to emergency systems are not blocked; and

(6) Passengers are notified of the presence of any dangerous articles or of any other conditions or circumstances that would constitute an element of risk.

Hazardous Materials

c. All Subchapter T vessels are subject to the HMTA (U.S.C. 1801-1812) when carrying hazardous materials. For the purposes of 49 CFR, a vessel is a "cargo" vessel when carrying 16 or less passengers. When carrying more than 16 passengers, Subchapter T vessels are "small passenger" vessels.

Foreign Vessels

d. A vessel of a foreign nation party to the 1974 International Convention for the Safety of Life At Sea (SOLAS), and to the 1978 Protocol to the convention, that possesses a valid Passenger Ship Safety Certificate or Exemption Certificate shall be examined at least annually. If in compliance with requirements of the convention, it shall be issued a Control Verification for Foreign Vessel (Form CG-4504). A Canadian vessel possessing a valid Canadian Certificate of Inspection (COI) shall be examined at least annually. If in compliance with the terms of its COI, it shall be issued Form CG-4504 (see chapter 20 of this volume). Foreign vessels not possessing SOLAS certificates that meet the applicability requirements of Subchapter T shall be inspected and certificated in the same manner as are U.S. vessels.

Vessels Propelled by Sail

e. A "sail vessel," for purposes of Subchapter T, is a vessel that is propelled entirely by sail. A vessel with sails that also has means of steam, mechanical, or electrical propulsion shall not be considered a "sail vessel."

Temporary COIs

f. Form CG-854 shall be used as on other inspected vessels. Pending receipt of new Forms CG-854, reference to "46 U.S.C. 399" in the first paragraph should be changed to "46 U.S.C. 3309(b)."

Accepted Classification Society Standards

g. The American Bureau of Shipping (ABS) and Lloyd's Register of Shipping are currently the only classification societies whose standards of construction and equipment have been accepted by the Commandant relative to vessels inspected under Subchapter T.

Life Ring Buoys

h. Previous specifications for life ring buoys in 46 CFR 160.009 and 160.050 required marking as follows: "For use on motorboats not carrying passengers for hire." These specifications have now deleted the requirement for such markings. Life ring buoys already manufactured shall not be disapproved on the basis of such markings.

Spare Fuel for Outboard Motors

i. Under the authority of 46 CFR 147.4, certification has been given by the Commandant for the on-deck stowage of spare gasoline on T-boats. This applies to vessels that are propelled by outboard motors, as well as vessels carrying tenders, launches, etc., that are propelled by outboard motors. This certification is contingent upon the following conditions:

(1) The gasoline must be carried in steel containers with a capacity not exceeding 23 liters (6 gallons), constructed so as to have a built-in ullage space.

(2) Such containers must be of at least 20-gauge, welded steel construction built to withstand an internal pressure of 25 psi.

(3) Containers shall comply with the American Boat and Yacht Council, Inc. (ABYC) H-25 standard for portable fuel systems and portable containers for flammable liquids.

(4) Containers must be stowed in a rack on deck as far as possible from areas normally transited by passengers, to facilitate effective firefighting. Particularly, they must be stowed away from ventilation intakes and sources of ignition. The stowage arrangement must be approved by the OCMI.

(5) Fire extinguishing devices and their locations shall be approved by the OCMI.

(6) A maximum of 10 gasoline containers may be stowed aboard the vessel at any time.

(7) "No Smoking" signs must be prominently displayed in the container stowage area.

(8) Empty containers must be handled and stowed with the same care as full containers.

(9) The vessel's COI must be endorsed to reflect the stowage of gasoline containers aboard.

Final authority to authorize such carriage of gasoline rests with the OCMI. It should be granted only after the vessel's owner documents a bona fide need for the extra fuel and meets all the control conditions.

Radiator or Air Cooled Engines

j. Radiator or air cooled engines are prohibited by 46 CFR 182.15-10. This regulation was the result of a past ABYC standard to discourage the use of standard-type automobile engines, which had proven unreliable. The ABYC now permits air or radiator cooled engines provided that there is adequate ventilation for the engine. A departure from this regulation is authorized for well protected and ventilated engines, provided that a temperature alarm and remote indicator are installed. Section 182.15-10 will be revised to reflect this change in policy.

SOLAS 74

k. For Application of SOLAS 74, see MSM II-E2.

MSDs

l. For information on Marine Sanitation Devices (MSDs), see MSM II-C2 regarding installation of MSDs.

4. Control of Unseaworthy Vessels

An uncertificated T-boat may be sold to a party who wishes to carry more than six passengers without having it inspected and recertificated, whether in ignorance or intentional disregard of the inspection statutes and regulations. This could result in operation of an unseaworthy vessel that subjects its passengers and crew to potential hazards. Therefore, upon voluntary surrender or withdrawal of a T-boat's COI, the OCMI shall notify the owner, in writing, that:

a. The vessel may not carry more than six passengers unless it is inspected and certificated for passenger service.

b. If the vessel is disposed of by sale, transfer, or other means, the former owner should inform the buyer of the obligation to obtain a valid COI before operating the vessel with more than six passengers. The former owner should notify the OCMI of the transaction within 48 hours, providing the name and address of the new owner.

c. Continued operation or use of the vessel, for any purpose, in an unseaworthy condition may constitute "negligent operations" under 46 U.S.C. 2302, and may subject the owner to civil or criminal penalties.

ACTION GUIDANCE: Notification may take the form of the sample letter found in Figure B4-1. A copy of the notification shall be placed in the vessel's file. If the vessel is documented, a copy shall be forwarded to the vessel's port of documentation. OCMIs shall maintain a monitoring program for all T-boats within their zones that are determined to be unseaworthy. Local Coast Guard and CG Auxiliary units should be advised of the names of such vessels. To assist inspectors and Auxiliary Courtesy Examiners, T-boats are required to display a Certification Expiration Date sticker in a readily visible location near the boarding area (see paragraph A.7).

FIGURE B4-1
SAMPLE WRITTEN NOTICE TO THE OWNER OF A

SMALL PASSENGER VESSEL

[On OCMI's Official Letterhead]

[ADDRESS OF OWNER]

Dear Mr./Mrs./Ms./Sir:

I am writing to you in regard to the small passenger vessel (Vessel Name), Official Number (O.N.), for which our records indicate you are the owner. As you may know, the Coast Guard Certificate of Inspection for this vessel recently (expired/was suspended/revoked) on (Date) for the following reason(s): (Specify). For your own protection, this letter is to inform you of some of the less apparent aspects of small passenger vessel laws and regulations and to ensure that you are aware of certain requirements this situation presents for you.

First, the vessel may not be operated carrying more than six passengers until existing deficiencies are corrected and/or the vessel is inspected and re-certified for passenger service.

Second, if you should sell or transfer your vessel to a new owner, please inform the new owner of his or her obligation to obtain a valid Certificate of Inspection before employing the vessel in the carriage of more than six passengers. I ask that you also inform my Inspection Department, within 48 hours, of any change of ownership and provide the name and address of the new owner.

Finally, you should be aware that operating a vessel in an unseaworthy condition may constitute negligent use under Federal Law (Title 46, United States Code, Section 2302), and could subject you to civil or criminal penalties.

A copy of this letter has been placed in the vessel's file at this office (and a copy forwarded to the vessel's port of documentation). If you should have any questions, please do not hesitate to contact my Inspection Department at the telephone number listed above

Sincerely,

(Signature)
(Title)

5. Charters of Small Passenger Vessels

Demise or "Bareboat" Charters

a. The following guidance is intended to be helpful in determining whether a vessel under a purported demise, or "bareboat," charter is subject to inspection. Often, information is received from third parties that must be verified before such a decision may be made. An effort should be made to discuss each case with the vessel owner to learn the details of the owner's operation, to inform the owner of the requirements of a valid bareboat charter, or to clarify Coast Guard enforcement policy, if necessary. OCMI's shall refer to the district commander all cases that cannot be clearly determined initially, deferring action pending the district commander's determination.

Background

b. The law that requires the inspection and certification of small commercial passenger-carrying vessels was enacted on May 10, 1956, by a Congress gravely concerned over several marine casualties involving loss of life on uninspected vessels that were carrying passengers for hire. Three of the most tragic incidents were the sinkings of the motor vessels JACK and PELICAN off Long Island, in separate incidents in 1951, and the loss of the sailing vessel LEVIN J. MARVEL in Chesapeake Bay in 1955. These casualties resulted in the combined loss of 70 lives. The legislative history of the Act (now codified in Title 46, U.S.C.) reflects the will of a Congress determined to lessen the assumption of needless risks by private citizens who are carried aboard small passenger vessels.

Demise Charter Concept

c. The concept of bareboat, or demise, chartering of vessels has developed in admiralty law as a legitimate means of transferring the rights of ownership of a vessel to a charterer for a period of time. At the time of the drafting of the Act of May 10, 1956, demise charters were seldom used by private firms, in favor of other more convenient and less risky charter agreements such as the time charter. Their use was most often made by the federal government as a device for acquiring necessary merchant vessel tonnage in times of war and emergency. During World War II, the government took over and operated, directly and through "general agency agreements," many privately owned ships. Rather than condemn and pay for such a ship, the government frequently used the device of taking it on demise from the private owner. Virtually all bareboat charters were made for a period of time that exceeded a single voyage. Considering the motivating factors behind the Act and the way in which bareboat charters were commonly used at the time of its drafting, it is doubtful that the Congress intended to create a specific exemption from inspection for private yachts being bareboat-chartered to carry large parties of passengers on pleasure cruises. This practice has, however, become fairly common in recent years, and has withstood most legal challenges when all of the requirements of a valid bareboat charter are complied with. Such a charter, although it may expose the charterer to considerably higher risk than the charterer would assume as a passenger aboard an inspected vessel, is a legitimate option the charterer has the freedom to choose.

Enforcement

d. The Coast Guard's enforcement role in this specific area is then limited to ensuring that charters that purport to be bareboat, in fact are. Some vessel owners are unaware or have been misinformed of the requirements for a valid bareboat charter. Others attempt to create the appearance of a bareboat charter to avoid the perceived expenses and inconvenience of Coast Guard inspection. Many of these persons never ask the local marine safety office (MSO) or marine inspection office (MIO) what would be required to meet the small passenger vessel rules. In fact, the cost and inconvenience in many cases is considerably less than might be thought.

Evaluations of Charters

e. The decision as to whether or not a valid bareboat charter exists is not a subjective one. The necessary conditions of bareboat charters have been fairly well standardized, with the most significant and difficult test being that of "control." The owner must give up his or her vessel "pro hac vice" (for the occasion) as a complete demise, turning over the incidents of ownership to the charterer: this includes complete management, control, and operation. Some yacht owners are reluctant to give charterers such complete control. Nevertheless, failure to do so creates an invalid bareboat charter. Likewise, any payment of consideration by the guests of the charterer, either to the charterer or the owner, would result in the guests being considered passengers for the purpose of the inspection statutes. To determine accurately if a bareboat charter is valid, it is necessary to evaluate not just the terms of the agreement between the parties, but also the operation itself. It is not uncommon for the two to be leagues apart. In other cases, the charter may be fully in accordance with the agreement, which is itself faulty. For this reason, the evaluation process sometimes requires boarding a vessel while underway so that investigating officers may obtain first-hand information.

Elements of Valid Bareboat Charters

f. The following provisions are indicative of a valid bareboat charter. Note that a valid bareboat charter does not necessarily require that all of these elements be present. Each arrangement must be evaluated on its own standing:

(1) Although a master or crew may be furnished by the owner, full possession and control must be vested in the charterer (a provision requiring the charterer to be guided by the advice of the furnished master or crew, in regard to technical matters or navigation, is acceptable);

(2) The master and crew are paid by the charterer;

(3) All food, fuel, and stores are provided by the charterer;

(4) All port charges and pilotage fees are paid by the charterer;

(5) Insurance is obtained by the charterer, at least to the extent of covering liability not included in the owner's insurance. A greater indication of full control in the charterer is shown if all insurance is carried by the charterer (of course, the owner retains every right to protect his or her interest in the vessel);

NOTE: Any provision that tends to show retention of possession and control (including basic navigation) by the owner or the owner's representative should be carefully examined to see if it contradicts the claim to have created a bareboat charter.

(6) The charterer may discharge, for cause, the master or any crewmember without referral to the owner; or

(7) The vessel is to be surveyed upon its delivery and return.

6. Cable Ferries

On 25 July 1922, the Acting Solicitor of the Department of Commerce rendered an opinion regarding a vessel operated as a double-ended ferry. The vessel had two drums aboard for endless cable that was rigged onshore at each side of the river; the vessel was thus pulled back and forth by machinery. This vessel was determined to be "propelled by machinery" and thus subject to inspection under 46 U.S.C. Chapter 33.

7. Railing Installations

Case History

a. A recent casualty has indicated a need for particular attention to railing installations on T-boats. The vessel involved was a 95-foot party fishing boat, with 63 persons aboard. In a moderate sea, the vessel rolled to starboard and all passengers on that side of the vessel leaned or fell heavily upon the railing at the same time. The railing gave way and nine persons fell overboard. Fortunately, all were recovered and no injuries were sustained. The vessel had been inspected 7 months prior to the casualty. Subsequently (not as a requirement of the inspection), the owner replaced the aluminum railing sockets without the OCMI's knowledge or approval. The replacement sockets were not of a type accepted for marine use, and when installed and painted the material type was not readily discernible. The failure of these aluminum sockets was determined to be the primary cause of the casualty.

Inspection Requirements

b. During inspection of a T-boat, the inspector shall question the owner or the owner's representative as to any repairs that have been made or are anticipated. The requirement for such repairs or alterations to be made only with the OCMI's approval shall be emphasized. All railings shall be examined visually to identify defects or material problems, then given an appropriate test of their ability to withstand the cumulative load of persons who may rely upon it for support. Prior to this casualty, moderate shaking of a railing installation had been regarded as sufficient, in the interest of avoiding costly, inspection-related repairs. However, the casualty cited above demonstrated that railings may periodically be required to withstand a cumulative, instantaneous lateral force from a large number of people. Although a destructive test is not desired, the inspector shall be satisfied that a similar casualty is not likely to occur.

8. Inspection of Shell Plate Butt Welds of Aluminum T-Boats

In 1996, during routine drydocking examinations of several aluminum T-boats constructed in a southern Louisiana shipyard, circa 1990, inspectors discovered that the edges of the shell plate at the joints had received no edge preparation (i.e, square butts). This lack of proper edge preparation precludes any chance for consistent full penetration welds to be achieved. The particular builder has constructed over 400 aluminum boats since 1969, many of which remain in current service with no known history of structural failure due to the poor welding detail. It is further believed that this phenomenon is not restricted to this single builder but is probably common place in aluminum boats constructed by other U.S. yards on the Gulf Coast.

Due to the method of fit-up, welding and lack of back gouging, a lack of fusion line exists within the weld and is not readily apparent from visual inspection. Existence of this lack of fusion was confirmed by x-rays of the shell welds.

Prior to these discoveries, this type of fit-up and welding, though not generally deemed to be good marine practice, was not widely discouraged by the Coast Guard. While not considered acceptable from a technical standpoint, it has nonetheless proven its serviceability over time. However, a recent review of this detail by Commandant (G-MSE-2) personnel suggested that while it may not cause immediate catastrophic structural failure of the hull, the long ten-n effects of fatigue, to which aluminum is particularly susceptible, may affect the long-term durability of the hull to resist inherent fracturing while in service or from some mechanical impact damage.

As previously mentioned, there is no readily apparent failure history which warrants a complete reweld of the hull solely because it was constructed with lack of attention to good marine practice. To preclude future occurrence of this problem, specific policy for shell plate welding in new construction has been established in MSM II-A5.5.C.7 of this Volume. When considering the risk to existing aluminum vessels, the short interval longitudinal and transverse stiffening required by NVIC II -80, plus their proven in-service record, and excellent durability, obviate the need for immediate drastic repairs.

To standardize inspection procedures and to minimize the potential for future failures, the following actions shall apply to all aluminum T-boats in service, especially those fabricated in Gulf Coast shipyards.

a. All vessels shall be subject to a mandatory annual internal structural examination in conjunction with regularly scheduled inspections for the purpose of determining if butt and scam welds are being adversely affected by subsurface defects and discontinuities.

b. Careful attention shall be paid to the condition of the longitudinal and transverse structural members and their weld attachments to the shell plate. Any fractures to these welds shall be documented and repaired immediately.

c. The use of non-destructive testing, particularly X-rays, for the sole purpose of identifying lack of full penetration welds is discouraged.

d. Any subsurface discontinuity which results in an in service structural failure, or has been exposed by mechanical damage, shall be gouged to good metal and rewelded in accordance with the procedures set forth in the American Bureau of Shipping (ABS) Rules for Building Aluminum Vessels (I 975), Chapter 30 Section 30.7. or Lloyd's Rules and Regulations for Classification of Yachts and Small Craft, Part 2, Chapter 3, dependent on the standard originally used to meet the structural design requirement of 46 CFR 177.300.

e. Surface discontinuities, such as porosity stemming from new construction, should be accepted as is, unless it is determined that it is being caused by electrolytic corrosion.

f. A notation will be made in the MSIS data for each vessel to ensure that the annual examination requirement is followed. Additional MSIS entries shall be made concerning the discovery of structural failures and their repairs.

9. Public Awareness

General

a. The general public is typically unaware of the Coast Guard's requirements for small passenger vessels. It is for this reason that an aggressive public information program is considered necessary, particularly in zones in which a large number of this type of vessel operates. A primary means of conveying information to the public is publication of a marine safety newsletter. An information package that can either be mailed out in response to telephone inquiries or handed out during personal visits from the public is another convenient method of distributing information.

Certification Expiration Date Stickers

b. 46 CFR 176.01-45 requires T-boats to display certification expiration date stickers. This requirement is intended to increase public awareness of vessel inspection requirements and to encourage the public to favor T-boats that indicate that they meet those requirements. Stickers shall be provided by the inspector after the inspection for certification, or at any time that the inspector determines them to be necessary to meet the intent of the regulations (the federal stock number for these is 7530-01-GF2-8620). The stickers are designed so that the expiration date of the COI can be punched in the date block at the bottom with a standard one-hole punch. Expired stickers and those on vessels whose COI's are surrendered or revoked shall be removed. OCMI's shall provide punches and scrapers to marine inspectors as needed.

B. EXCURSION VESSELS

1. Definition

An "excursion vessel," as referred to in 46 CFR 2.01-45, 72.40-5 (c), and 177.35-1(c), is a passenger vessel that engages in short cruises for special events or recreational purposes. The operation of an excursion vessel is chiefly seasonal and normally involves the carriage of deck passengers.

2. Permit to Carry Excursion Party, Form CG-949

When such operation is not permitted under the vessel's normal COI, Form CG-949 may be issued under 46 CFR 71.10 or 176.01-30, as applicable. This is the case when a passenger vessel is permitted to carry additional passengers or to operate on an extended route, or when a cargo or miscellaneous vessel is permitted to carry recreation parties on a 1-day basis. The permit shall be issued for a limited time, and shall be considered a temporary supplement to the COI only. An excursion permit shall not be used to circumvent inspection requirements. Instructions on the issuance of Form CG-949 are contained in chapter 3 of this volume.

3. Conditions of Permits

The OCMI shall determine the maximum number of additional passengers that may be carried, the number and type of lifesaving appliances that must be provided, and the limitations of route, etc., for a vessel to engage in an excursion as provided in 46 U.S.C. 2113. Inspection of the vessel prior to issuance of Form CG-949 shall be equivalent to reinspection of a passenger vessel. Particular attention shall be given to lifesaving and firefighting appliances. The applicable minimum stability and fire safety standards shall not be waived or relaxed in any case.

4. Passenger Capacity

The number of passengers normally permitted on excursion vessels shall be governed by 46 CFR 176.01-25. Vessels that do not comply with structural fire protection requirements of 46 CFR 177.10-5 shall not carry more than 150 passengers. For those vessels inspected under 46 CFR, Subchapter H (Passenger Vessels), there are no specific limitations of the number of passengers permitted (other than stability and subdivision criteria). To obtain some degree of uniformity in the application of the regulations, the criterion of one passenger for every 10 square feet of deck space shall be used as a guide in determining the number of passengers permitted.

5. Operational Limits

The number of passengers and the route permitted for a vessel engaging on a temporary excursion shall be limited to an operation that the OCMI believes can be safely undertaken. Careful consideration of possible downflooding (interior flooding of a vessel from the decks or over the gunwale) shall be given in permitting an excursion route different from that which appears on the COI. Likewise, stability of the vessel must always be considered.

C. CARGO VESSELS

1. Carriage of Passengers (Persons in Addition to the Crew).

Requirements for Notice to Passengers

a. Under 46 U.S.C. 3304, the owner, charterer, managing operator, agent, master, or individual in charge of a cargo vessel shall notify all passengers of the presence aboard of any dangerous articles, or of any other condition or circumstance that would constitute a risk of safety for the passengers or crew, prior to sailing. Accordingly, all persons other than members of the crew and military personnel carried (either under waiver or otherwise) must be given this notice. Failure to give such notice renders the owner, charterer, managing operator, agent, master, or individual in charge subject to a civil penalty of not more than $1,000, for which the vessel is liable in rem (see 46 U.S.C. 3318(h)).

Operation upon Examination

b. A cargo or tank vessel shall be examined to ensure that it complies with the laws and regulations relative to lifeboats, life preservers, and other lifesaving equipment before it may carry persons in addition to the crew. After a satisfactory examination, authority to carry up to 16 persons in addition to the crew on domestic voyages, and up to 12 persons in addition to the crew on international voyages, may be granted by issuing a COI Amendment or by a special endorsement on the COI.

2. Subdivision

The 1966 Load Line Convention allows deeper drafts for those cargo vessels (other than tankers) that qualify as one or two compartment subdivision vessels. The determination and assignment of a load line is a function delegated to ABS. Therefore, when a deeper draft is allowed due to subdivision consideration, inspections for certification and reinspections must be conducted with the object of proper maintenance of bulkheads, closures, etc., essential to the preservation of the applicable subdivision criteria (see volume IV of this manual).

3. Equivalents Filed with the International Maritime Organization (IMO)

➔ See MSM II, Section E, Chapter 2 (MSM II-E2).

4. Carriage of Combustible Liquids in Bulk Aboard Vessels

General

a. Vessels certificated as passenger, cargo, or miscellaneous vessels may carry limited quantities of flammable or combustible liquid cargo in bulk in accordance with 46 CFR 30.10-5, 70.05-30, and 90.05-35. However, the carriage of such cargo may not be the principal purpose or use of such vessels. "Limited quantities" shall not exceed 20 percent of the vessel's deadweight tonnage, as applied to bulk liquid cargo or that carried in integral or independent tanks. The OCMI must determine on a case-by-case basis that the vessel's "principal purpose" is not the carriage of liquid bulk cargo.

Carriage Aboard Barges

b. Cargo barges certificated under Subchapter I may not carry flammable or combustible bulk liquid cargoes in any quantity. Barges carrying such cargoes shall be considered tank barges and must meet the requirements of Subchapter D. Subchapter I barges may carry fuel for the use of their machinery and, when there is a need for additional fuel on occasional long voyages, fuel for the propelling vessel. This may be done only when a genuine need for the fuel exists and there is no attempt to circumvent the applicable admeasurement or safety regulations.

NOTE: This concept should be applied only for occasional long voyages. If additional fuel is needed on a regular route, a propelling vessel with sufficient fuel capacity of its own should be employed.

Discharge Containment

c. The cargo oil discharge containment requirements of 33 CFR 155.310 shall be applied to Subchapter I vessels, with a capacity of 250 or more barrels, which are carrying oil cargo. The requirements of 33 CFR 156 apply during transfer operations aboard such vessels, but 33 CFR 157 does not apply to vessels certificated solely under Subchapter I.

Carriage of Unusable, Bunker and/or Oil Residue on Vessels Permanently Laid-Up, Dismantled, or Out-of-Commission

d. Bunker oil and bunker oil residue existing in such vessels (i.e., on board at the time the vessel was permanently laid up, dismantled, or placed out of commission and remaining on board) will not be classed as cargo. The condition of the tanks must be acceptable to the OCMI. Additional oil or oil residue cannot be added to any bunker, cargo or independent tanks on a vessel permanently laid up, dismantled, or out of commission (See MSM II-B1.C.11 of this volume).

Carriage of Fuel for the Towing Vessel on Vessels Permanently Laid-Up, Dismantled, or Out-of-Commission

e. The carriage of fuel for the towing vessel on non-certificated vessels permanently laid up, dismantled, or out of commission being towed to scrap is not allowed. A vessel that carries fuel for the towing vessel would need to be inspected and certificated as a tank vessel. It would also need to be issued the appropriate domestic and international certificates.

D. TANK VESSELS

1. Permanently Moored Tank Vessels

General

a. A tank vessel permanently moored at a fixed location to dispense, receive, or store flammable or combustible liquids in bulk may, at the request of the owner, be considered "substantially a land structure" subject to the waterfront facility regulations (33 CFR 126, 154, and 156). To qualify under this terminology, the vessel must be securely and substantially moored by means such as cables, chains, or structural steel to a solid onshore structure. Such mooring arrangements must be approved by the OCMI and must be capable of withstanding wind, ice, and water conditions normally encountered at the location.

Requirements for Notification

b. It is incumbent upon the owner, the owner's representative, or the operator to notify the OCMI before any changes are made in the mooring arrangement or location of the structure. The structure may be temporarily placed in navigation (becoming a vessel again) only with the approval of the OCMI, who may issue requirements as necessary to ensure the safety of the vessel and U.S. waters. The authorization to return the vessel to navigation may be issued by letter, a COI of limited duration, or a Permit to Proceed, as appropriate. When the vessel is re-moored, the OCMI must approve the new arrangement before the vessel may again be considered "substantially a land structure." A ship documented as a vessel of the United States may be considered "substantially a land structure" under this policy under some circumstances (see paragraph MSM II-B4.I.1 below for further discussion of permanently moored structures).

2. Tankships Carrying Grain Cargo

General

a. Study of the modifications needed for a tank vessel to carry grain in bulk in its cargo tanks indicates that ordinarily none of the essential features of a tankship are lost. Sounding pipes are fitted to each tank; the cargo stripping suctions are fitted with burlap-covered roseboxes and made to serve as bilge suctions; a nonreturn valve is installed at the stripping pump suction; the main cargo suctions are blanked off and cement-sealed burlap is installed at each bell mouth; the main cargo header in the pumproom is blanked off; and all cargo valves are closed and locked. Returning the vessel to tanker service requires removal of blanks from the main cargo suctions and manifolds, removal of burlap and cement seals in the cargo tanks after discharge of the grain cargo, and cleaning out of the remnants.

Requirements for OCMI's Evaluation

b. Upon inspection of a tank vessel that has been modified to carry grain in bulk, the OCMI shall determine if the essential features that make the vessel eligible to carry flammable or combustible liquid cargo in bulk have been removed. If not, the COI need not be amended unless this is requested by the owner.

3. Tank Barges Not Carrying Flammable or Combustible Liquids

A barge that has been certificated to transport flammable or combustible Grade D and E liquids may retain its unexpired COI aboard when transporting nonflammable or noncombustible liquid cargoes. However, the barge must at all times comply with Subchapter D requirements.

> **NOTE:** Any changes to the vessel's equipment or construction required by the regulations for transporting other cargoes would automatically make the COI subject to withdrawal.

4. Metal Hoods and Housings

46 CFR 32.35-5 requires a metal hood or housing over pump engines on tank barges, to protect the pump engine against weather and damage during cargo or hose handling. Installations in which metal hoods or housings are unnecessary to provide the desired protection may be accepted, provided the arrangement affords equivalent protection. Each tank barge pump engine installation should be evaluated on its own merits to determine whether installation of a metal hood or housing is necessary.

5. Refinery Waste, Dirty Ballast, Etc.

Barges used for the transportation of refinery waste, residual cargo, or dirty ballast from tank cleaning operations are subject to inspection and certification when they carry flammable or combustible liquids in bulk. The application of 46 U.S.C. 3701 et seq., to vessels other than public vessels is not contingent on the vessel's use in trade or commercial service, as long as the liquid is cargo or residue.

> **NOTE:** When such barges are used to handle flammable or combustible liquids, even if diluted with water, fire and explosion hazards are present and the applicable safeguards contained in Subchapter D must be met.

6. Location of Flame Arresters

In part, 46 CFR 32.55-20(b)(4) states that "The vent header shall be fitted with a flame arrester or pressure-vacuum relief valve." This regulation applies to the venting of tanks transporting Grade A liquid on tankships constructed on or after 1 July 1951. This regulation does not require either the flame arrester or the pressure-vacuum relief valve to be installed at the outlet. Some vessels have installed a pressure-vacuum relief valve in the horizontal deck header, rather than installing this type of valve or a flame arrester at or near the outlet; the Commandant has accepted this arrangement. The required installation of a pressure-vacuum relief valve in the header is in addition to the pressure-vacuum relief valve in the individual branch vent line, which is not mandatory (see 46 CFR 32.55-20(b)(3)).

7. Carriage of Passengers

The provisions of paragraph C.1 above apply to tank vessels as well as to cargo vessels.

8. Unmanned Tank Barge Inspections and Examinations

General Policy

a. Vessels that carry oil or any hazardous materials in bulk as cargo or in residue are required to be inspected or examined at least once annually by 46 U.S.C. 3710. To satisfy these requirements, the Commandant's policy for the inspection of unmanned tank barges is that these vessels will have:

(1) Biennial inspections for certification; and

(2) Annual examinations occurring between the 10th and 14th month after the issue date of the COI.

The biennial inspections for certification shall be conducted by qualified marine inspectors in accordance with chapter 6 of this volume. For unmanned tank barges that are certificated for the carriage of bulk dangerous cargoes under 46 CFR 151, annual examinations (formerly called "midperiods") shall be conducted by qualified marine inspectors. For unmanned petroleum tank barges not certificated for the carriage of bulk dangerous cargoes, annual examinations may be conducted by qualified marine inspectors or port safety boarding teams provided they are qualified to conduct these examinations.

Port Safety Boarding Team Guidelines

b. Port safety boarding teams will, in the course of routine monitoring or boardings, observe most of the items that should be inspected for an annual examination. In conducting an annual examination, a boarding team shall include on its checklist of items to be examined:

(1) An examination of all firefighting and safety equipment on the vessel; and

(2) A visual inspection of accessible parts of the vessel. Particular attention shall be paid to any obvious signs of damage, deterioration, or temporary repairs to the cargo piping, visible hull, flame screens, etc.

When a routine monitoring/boarding of an unmanned petroleum tank barge is scheduled between the 10th and 14th month after the COI is issued, the annual examination may also be conducted by the port safety boarding team. When no discrepancies are found, the boarding team should date and sign the COI. If discrepancies are discovered, they should be rectified per local OCMI guidelines. An entry should be made into the Marine Safety Information System (MSIS) indicating that a reinspection has been done. See also COMDTINST 5010.8.

Local Procedures

c. Commanding officers (CO's) of MSO's should establish local procedures as to when a port safety boarding team will be authorized to conduct an annual examination and endorse the COI on unmanned petroleum tank barges. Local monitoring/boarding checklists should also be modified or established as necessary.

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9. Pressure Vessel Type Cargo Tanks

A review of the records of several tank barges, over 20 years old, that were certificated to carry liquefied gas in pressure vessel type cargo tanks has indicated that their tanks were never hydrostatically tested. Under 46 CFR 38.25-1(b), a hydrostatic test of such tanks may be conducted at any time that an inspector considers it necessary to determine their condition. When a tank barge 20 or more years old becomes due for internal examination, the cargo tanks should be very carefully examined; the desirability of a hydrostatic test should be especially considered.

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10. Trans-Alaska Pipeline Service (TAPS) Tankships

Background

a. Background. The "Report of the TAPS Tanker Structural Failure Study" was published on 25 June 1990. The "TAPS Tanker Structural Failure Study Follow-up Report" was published in May 1991. Both reports addressed the reasons why TAPS tankers experienced a disproportional high number of structural failures compared to vessels in other trades. In order to combat these failures effectively, the principal recommendation of the TAPS study concerned the establishment of Critical Areas Inspection Plans (CAIPS) for all'TAPS tankers. Specific guidance for CAIPs is contained in NVIC 15-91, NVIC 15-91, Change 1 and Section 5.J. of this manual.

Between June 1990 and June 1996, the Coast Guard in partnership with TAPS operators and the ABS have conducted literally hundreds of CAIP examinations of TAPS vessels. While all TAPS vessels.were subject to an annual examination of at least some portion of the cargo block, 16 vessels of which 14 were in three distinct classes, were subject to more frequent examinations due to severe structural problems caused by a combination of a number of factors including but not limited to poor design details, poor construction practices, lack of adequate internal coatings systems, lack of maintenance, age and harsh environmental conditions that stressed hulls and were exacerbated by various operating practices employed prior to the studies.

As of June 1996, only six of these targeted vessels in the ATIGUN PASS 165,000 deadweight ton class remain in existence. Only two of these vessels are currently in service. However, both operators of these vessels, BP America and SeaRiver Maritime, have been very effective in improving original design and construction details to the extent that the special six month interval between CAIPs originally imposed on these vessels is removed and the vessels may be examined under the one-year CAIP interval provided for by NVIC 15-91. The vessels in this class are:

- S.S. ATIGUN PASS
- S.S. THOMPSON PASS
- S.S. BROOKS RANGE
- S.S. KEYSTONE CANYON (downsized to 125,000 dwt in 1990)
- S.S. S-R BENICIA
- S.S. S-R NORTH SLOPE

Definitions

b. Definitions

(1) TAPS Tanker A vessel that transports oil in bulk from Valdez, Alaska to any U.S. or foreign port.

(2) ANS Service Alaska North Slope service. A term designated by the U.S. Department of Commerce for tankers carrying oil in bulk from Valdez to foreign ports. This definition is interchangeable with TAPS.

(3) Cargo Block As applicable to tankers and OBOS, all cargo and ballast tanks between the forward most and after most transverse cargo bulkheads.

CAIP Requirements for TAPS Tankers

c. CAIP Requirements for TAPS Tankers. G-MOC will maintain an MSIS VFSC for CAIP status of TAPS tankers. TAPS tankers will be required to subscribe to CAIP requirements as follows:

Tankers New to TAPS Service

(1) Tankers New to TAPS Service. All tankers initially entering the TAPS trade will be required to establish a CAIP for the full cargo block per NVIC 15-91. Operators may apply to Commandant (G-MOC) for alternative compliance with CAIP requirements per NVIC 15-91, Change 1, 5.b.(2)(d) - (f) but will be subject to a baseline examination by the Traveling inspectors (G-MO-1) prior to G-MOC approval. The CAIP interval will be no longer than one year until a structural history can be developed by the Coast Guard. CAIPs may be performed within the tenth or fourteenth month following the previous CAIP survey.

Existing TAPS Tankers

(2) Existing TAPS Tankers. Tankers that have been in continuous TAPS service are normally subject to annual CAIPS. However, operators may apply G-MOC for relief of certain CAIP requirements on a case by case basis as outlined in NVIC 15-91, Change 1. This includes elimination of certain portions of the cargo block from a CAIP examination or extending CAIP intervals. Favorable approval of these requests will be based primarily on review of the structural failure history which may show the lack of significant problems over time or past structural problems which have permanently been corrected.

Tankers In and Out of TAPS Service

(3) Tankers In and Out of TAPS Service. Circumstances may cause TAPS tanker operators to place vessels on other routes for extended periods. It is not mandatory to maintain the CAIP during this period. However, the vessel must complete a CAIP prior to return to TAPS service if the prescribed interval since the last CAIP has been exceeded.

CAIPs vs. ABS Enhanced Survey

(4) CAIPs vs. ABS Enhanced Survey. Guidelines NVIC 15-91, Change 1 permits TAPS-operators to substitute ABS Enhanced Survey guidelines for CAIPs on a case by case basis. It has been determined that the Enhanced Survey 3'.s equivalent to the CAIP requirements for those vessels that are approved for a normal two-in-five-year internal examination interval which would correspond to the ABS Special Survey and Intermediate Survey requirements. However, the Enhanced Survey requirements do not equate with a CAIP in both scope and depth of examination on an annual basis. Operators must affirm in writing to G-MOC that the Enhanced Survey requirements normally complied with at Special Survey will be performed to satisfy annual CAIP requirements.

TAPS Tankers involved in Export Trade

(5) TAPS Tankers involved in Export Trade. In April 1996, the President signed an authorization allowing export of Alaskan oil to foreign markets. The authorization requires that exporters obtain a special permit from the Department of Commerce to engage in this trade. As a condition of obtaining the permit, the exporter must employ a tanker that is subject to an annual CAIP survey.. Consequently, although NVIC 15-91, Change 1 provides operators to extend CAIP intervals, separate rule making by the Department of Commerce will require those vessels employed in oil export service to undergo a mandatory annual CAIP.

TAPS Tankers Enrolled in the ACP

(6) TAPS Tankers Enrolled in the ACP. Tankers enrolled in the Alternative Compliance Program described in MSM II-A5.E.6 may substitute ABS Enhanced Survey Guidelines for the CAIP examine provided that surveys are performed to the same extent required by the CAIP.

Reports of Structural Failure

(7) Reports of Structural Failure. TAPS operators shall report Class 1 and 2 structural failures in accordance with the procedures outlined in Subsections MSM II-A5.E.3.a and A5.E.9.a. Acceptance of Enhanced Survey requirements in lieu of CAIPs or enrollment of a vessel in ACP does not relieve an operator of reporting responsibility to the cognizant OCMI.

Maintenance of Records

(8) Maintenance of Records. A complete, up to date CAIP shall be required on each TAPS tanker and in the operator's office. A copy of the detailed survey report normally completed to append the vessel CAIP shall be provided to the cognizant OCMI where the survey is performed or where repair work, if required, will be conducted. An executive summary highlighting the CAIP shall be provided to G-MOC for review and forwarding to the Traveling Inspectors for maintenance in the TAPS file. The executive summary should contain the same, but less detailed information, required by enclosure (4) of NVIC 15-91. It is expected that the CAIP update and the executive summary be completed and placed aboard the vessel and forwarded, respectively, within 60 days of the CAIP. The cognizant OCMI shall ensure the vessel's MSIS files are updated to reflect the current CAIP.

TAPS Repair Guidance

d. TAPS Repair Guidance. The hierarchy of repairs described in this section shall be considered as a guideline for repairs whether the fracture is found at the CAIP survey during routine operations.

Class 1 Structural Failures

(1) Class 1 Structural Failures. All such failures must be immediately repaired prior to the vessel being permitted to return to service in accordance with MSM II-A5.E.3. Operators are always required to submit a Coast Guard form CG-2692, "Report of Marine Accident, Injury or Death" whenever a Class 1 failure occurs or is found.

Class 2 Structural Failures

(2) Class 2 Structural Failures. These failures shall be evaluated by the operator in concert with the cognizant OCMI and vessel's class society. Temporary repairs may be authorized. in some cases, if the failure has arrested itself or poses no further chance of propagation, monitoring of the fracture with no repair may be authorized by the OCMI until the next scheduled repair period. No CO-2692 "Ls required to be filed.

Class 3 Structural Failures

(3) Class 3 Structural Failures. Repair of Class 3 failures may be held in abeyance to the next regularly scheduled repair period at the discretion of the operator. Repair of a Class 3 failure may be deferred and monitored if the OCMI determines that the repair would actually create a bigger problem such as expanding the heat effected zone between the weldment and base metal and causing additional stresses to be concentrated into a design detail.

Temporary vs Permanent Repairs

(4) Temporary vs Permanent Repairs. It is imperative that OCMIs consider all past approved repair procedures which have been effective in service in order to ensure consistency between zones. It is also important that the root cause of any structural failure be determined or understood prior to approving a repair as either "temporary" or permanent." The primary goal of the CAIP guidelines is to prevent reoccurrence of structural failures and not simply just to address the end result of the root cause of the problem. The terms "temporary" and "permanent" can have multiple meanings that are clarified as follows:

(a) For Class 1 structural failures, temporary repairs mean emergency measures taken to allow a vessel to safely transit to a port or facility to effectively evaluate the failure and accomplish permanent repairs. In no case will a vessel be continued in service under the terms and conditions of the Certificate of Inspection, solely with these repairs, beyond the singular voyage to a discharge port and/or repair facility.

(b) For Class 2 and 3 structural repairs, temporary repairs mean measures taken to prevent a structural failure from propagating to the next higher class. Generally, it is intended that these measures need suffice only to the next regularly scheduled repair period when "permanent" repairs could be effected. However, past history has shown that in many cases, these "temporary" measures have satisfactorily arrested the cause of the failures. At the request of the operator, the OCMI should evaluate their effectiveness and may accept them as permanent, if warranted. In such cases, a CG-835 noting the temporary repair and requiring a subsequent permanent repair may simply be written off as completed, accordingly.

(c) For all three classes of failure, permanent repairs should not be necessarily construed as "repairs in kind." Structural failures resulting from a poor design detail will recur if that detail is restored as original. Much of the success realized to date in curtailing numbers of TAPS structural failures has resulted from improving design details. However, unless it is ascertained that a certain repetitive type fracture could reach critical proportions, it is acceptable to permit repair by traditional means such as "veeing" and welding. It should be recognized that structural repairs could be an iterative process, that is, several "permanent" repairs may be proposed and accepted before a modification is successful in preventing recurring fractures.

Repair Guidance

(5) Repair Guidance. Guidance on previously approved repairs can be obtained from numerous sources including but not limited to:

(a) The vessel's CAIP

(b) Traveling Inspectors (G-MO-1) files

(c) Classification society files

(d) "Guidance Manual for the Inspection and Condition Assessment of Tanker Structures" published by the international Chamber of Shipping.

E. SEAGOING BARGES

1. Introduction

46 U.S.C. 2101(32) and 3301(6) require hull and equipment inspections of every seagoing barge that is either manned or carries hazardous materials, flammable/combustible liquid including oil in bulk as cargo. However, any barges transiting beyond the boundary line, are either 79' or greater (for new vessels), or $\geq$ 150 GT (existing vessels) are required to have a valid Load Line Certificate. A certificated barge is subject to inspection requirements until the COI is surrendered or expired, even though it may be operated for part of the time in inland waters.

2. General Inspection Provisions

Operation on the High Seas

a. Only those vessels which are manned or carry hazardous materials, as noted in paragraph 1, above, are required to be inspected and certificated.

Plan Approval

b. Complete plan approval is required for all vessels contracted for on and after 1 January 1964; plans shall be submitted in accordance with 46 CFR 91.55.

Acceptance of Alternate Arrangements

c. The basic inspection requirements for these vessels are contained in 46 CFR, Subchapter I. It is the Commandant's policy that the OCMI construe the intent of the regulations liberally, while ensuring that the vessel can be navigated safely. Any unusual condition or feature of the vessel that is accepted by the OCMI at the initial or subsequent inspections shall be made a matter of record, so that it will not be questioned at a later date.

Load Lines

d. See 46 CFR, Subchapter E and volume IV of this manual for load line requirements. Barges over 79 feet in length which transit beyond established boundaries shall require load lines. If a load line assignment is not required, draft limitations may be imposed as a prerequisite to obtaining a COI when the OCMI judges them to be necessary for the safety of life and property.

NOTE: Recent revisions to the statutory language governing loadline requirements in 46 USC §5102 have eliminated the exemption opportunity vessels previously enjoyed from the wording in 46 CFR §42.03-5(b)(v). This revision makes load lines mandatory for all vessels which transit beyond the boundary line, including vessels conducting round-trip domestic “coastwise” voyages without visiting another U.S. port—so called “voyages to nowhere.” Until the regulations in Title 46 CFR are revised, this guidance shall hold as the Coast Guard enforcement policy on loadline requirements for vessels transiting beyond the boundary line, regardless of whether or not another port is visited during that voyage.

Lifesaving Equipment

e. When seagoing barges are manned, whether manning is required or permitted, the requirements of 46 CFR 94 apply. The regulations permitting substitution of inflatable life rafts may be applied. However, barges that do not sail more than 20 miles from a harbor of refuge and return to that harbor may be equipped with lifefloats or buoyant apparatus, in lieu of lifeboats or inflatable life rafts.

Manning requirements

(1) Certain barges may be unmanned if so authorized by the OCMI. However, if a crew is required by the OCMI:

(a) 75 percent of the crew must be citizens of the U.S., if the barge is documented and whenever departing a port of the U.S. (see 46 U.S.C. 8103);

(b) 65 percent of the deck department, exclusive of licensed personnel, must be able seamen as defined in 46 U.S.C. 8702 (This may be reduced to 50 percent on vessels permitted to have a 2-watch system.);

(c) On barges over 100 GT, all crewmembers must possess a Merchant Mariner's Document (MMD); and

(d) The watch system applies.

Permit Manning

(2) When the OCMI does not require the presence of a crew, one may be permitted, provided that:

(a) Persons carried as maintenance persons shall have no duties connected with navigation. A sample endorsement that may be used on the COI is:

> *"Certificated without a navigating crew. The vessel may carry one person as maintenance person and operator of the dumping mechanism, with no duties connected with the navigation of the vessel."*

(b) 75 percent of the personnel of the "permitted" crew are U.S. citizens, if the barge is documented and whenever departing a port of the U.S. (see 46 U.S.C. 8103); and

(c) On barges over 100 GT, all crewmembers possess an MMD.

3. Wooden Barges

Particular attention should be given to the inspection of seagoing wooden barges. If such a vessel is not in drydock at the time of its inspection, a thorough examination of the structure shall be made, insofar as possible. To this end, the ceiling may be lifted for examination of the framing as the marine inspector deems necessary. Should doubt as to the soundness of the structure remain, the vessel should be drydocked for further examination.

4. Non-Self-Propelled Harbor Dredges and Barges; Change Places of Employment

General

a. Non-self-propelled harbor dredges and barges of 100 or more GT, when voyaging on the high seas to change places of employment, are subject to inspection and certification. 46 CFR 91.01-10(c) provides for a limited or short-term certificate, by which the vessel may be operated manned or unmanned. In those cases when the vessel is manned, the intent is to require a more thorough inspection than if it were unmanned.

Plan Approval

b. Plan approval is not required for the certification of such vessels.

Inspections

c. The basic requirements for inspection of such vessels are contained in 46 CFR, Subchapter I. It is the Commandant's policy that in applying the regulations, the OCMI's construe their intent liberally, bearing in mind the overall responsibility to ensure that the vessel can be navigated safely.

Load Lines

d. See volume IV of this manual. When such vessels are not required to have a load line, the inspector shall ensure that there are adequate closures to maintain watertight integrity for the duration of the voyage. Draft limitations may be imposed as a prerequisite to obtaining a COI if the OCMI judges them to be necessary for the safety of life and property. Non-self-propelled dredges may carry spare parts for their own machinery without having them considered as cargo, if the OCMI judges the quantity and weight of such spare parts to be reasonable.

Lifesaving Equipment

e. When vessels are manned, whether manning is required or permitted, the requirements of 46 CFR 94 apply. Substitution of inflatable life rafts may be permitted.

Boilers

f. Some such vessels are equipped with boilers. When these boilers will be used during the voyage, they shall be given such operating tests and examinations as the OCMI deems necessary to ensure their proper functioning throughout the voyage. When these boilers will not be used during any part of the voyage, they will not be inspected (in any case, unsafe or unsatisfactory conditions shall be made a matter of record and the owner of the vessel so advised in writing by the OCMI).

Wiring

g. Only the electrical wiring that will be energized during any part of the voyage shall be subject to inspection. Any unsafe or unsatisfactory condition detected shall be made a matter of record and the owner of the vessel so advised in writing by the OCMI.

Drydocking

h. Drydocking: Domestic & Foreign Voyage Vessels

(1) *Foreign Voyage.* A drydock examination of the underwater hull and outboard fittings of such vessels is a prerequisite to issuance of a COI, unless there is a record of a satisfactory drydock examination within the preceding 18 months.

(2) *Domestic Voyage.* The OCMI shall normally require a drydock examination unless there is acceptable evidence presented of a satisfactory drydock examination within the past 3 years.

Manning

i. Manning: Required and Permitted

(1) *Required Manning.* Such vessels may be towed unmanned if authorized by the OCMI. However, if a crew is required by the OCMI:

(a) 75 percent of the crew must be citizens of the U.S., if the vessel is documented and whenever departing a port of the U.S. (see 46 U.S.C. 8103);

(b) 65 percent of the deck department, exclusive of licensed personnel, must be able seamen (for seagoing barges);

(c) On vessels over 100 GT, all crewmembers must possess an MMD; and

(d) The watch system applies (on voyages up to 600 miles only a 2-watch system is necessary).

(2) *Permitted Manning.* When the OCMI does not require a crew on such vessels, one may be permitted, provided that:

(a) Persons carried as maintenance persons have no duties connected with navigation. A sample endorsement that may be used on the COI is:

> *"Certificated without a navigating crew. The vessel may carry persons as maintenance persons with no duties connected with the navigation of the vessel."*

(b) 75 percent of the personnel of this "permitted" crew are U.S. citizens, if the vessel is documented and whenever departing a port of the U.S. (see 46 U.S.C. 8103); and

(c) On vessels over 100 GT, all crewmembers possess an MMD.

5. Barges Operated on Sheltered Waters of British Columbia

Barges of 100 GT and more making voyages on sheltered waters of British Columbia, defined in a U.S.-Canadian treaty of 26 July 1934 as "The waters of Puget Sound, the waters lying between Vancouver Island and the mainland, and east of a line from a point one nautical mile west of the city limits of Port Angeles in the State of Washington to Race Rocks on Vancouver Island, and of a line from Hope Island, British Columbia, to Cape Calvert, Calvert Island, British Columbia, the waters east of a line from Cape Calvert to Duke Point on Duke Island, and the waters north of Duke Island and east of Prince of Wales Island, Baranof Island and Chicagof Island, the waters of Peril, Neva and Olga Straits to Sitka, and the waters east of a line from Port Althorp on Chicagof Island to Cape Spencer, Alaska. . ." should not be inspected as seagoing barges.

6. Towing of Vessels to be Scrapped

➔ See MSM II, Section B, Chapter 1.

7. Ship Hulls used as Seagoing Barges

Ship hulls operated under the U.S. flag as seagoing barges to deliver cargo and scrap to foreign countries are subject to the following minimal requirements:

a. The vessel must comply with the regulations governing cargo stowage and securing arrangements. Approval by the National Cargo Bureau, Inc. (NCB) of these arrangements may be accepted as prima facie evidence of compliance.

b. A load line is required.

c. Inspection is required (including a drydock examination if necessary), followed by certification as a seagoing barge.

d. Should the vessel be manned, the following manning and equipment requirements are applicable:

(1) The vessel shall be manned by a master and at least six mariners;

(2) Sufficient primary lifesaving equipment for all persons on board is required; a lifeboat (carried in such a manner that it may be readily launched) or life raft is acceptable;

(3) Means for pumping bilges and discharging normal amounts of bilge water shall be provided;

(4) Provision should be made to supply electric power, when applicable to loads covered by 46 CFR 112.15; and

(5) Sufficient firefighting equipment should be provided to cope with any fire that may be anticipated during the voyage.

NOTE: For operations under a foreign flag, the vessel must possess a valid Load Line Certificate. Requirements other than these shall be imposed by the vessel's home administration or insurance underwriters, etc., not by the Coast Guard.

8. Inland Tank Barge Pressure Vacuum (PV) Valve Requirement (46 CFR 39.20-11)

The regulation requires that cargo tank PV valves be set not lower than 1 psig and 0.5 psig on the vacuum side. Some inland tank barge cargo tanks are not structurally designed for pressures and vacuums. During Vapor Control System (VCS) plan review, these barges were approved by the Coast Guard with PV valves set below those required by 46 CFR 39, to protect the structure of the barge.

a. The lower P/V valve settings have resulted in problems being encountered by some facilities attempting to conduct VCS operations with these barges. The problems may range from very slow transfer rates, to the inability to conduct transfer. Provided transfer procedures are followed, these are operational, not safety issues, since the tank venting system still serves to protect the cargo tanks from over/under pressurization during VCS operations. Vessel operators may continue to operate with these P/V valve settings if they so desire. However, if the owner/operator decides to upgrade the pressure settings or if the barge is displaying obvious signs of over-pressurization, then additional plan review or approvals may be necessary.

b. The Marine Safety Center (MSC) will enter PV valve settings in the MSIS (Vessel File Cargo Systems product set) for all future planned reviews of VCS. OCMIs shall make these entries for those not made by MSC and verify the PV valve is approved for the set pressures during routine scheduled inspections.

F. MOBILE OFFSHORE DRILLING UNITS (MODUS)

1. Introduction

MODUs are inspected and certificated under 46 CFR, Subchapter I-A. Subchapter I-A requires an inspection for certification every 2 years and a reinspection between the tenth and fourteenth month after issuance of the certificate. MODUs operating on the U.S. Outer Continental Shelf (OCS) are required to have annual onsite inspections, in accordance with the OCS Lands Act Amendments of 1978 (43 U.S.C. 1331, et seq). Self-propelled MODUs of 500 or more GT engaged in international voyages are subject to the requirements of SOLAS 74/78. These units have the option of compliance with SOLAS or with the IMO MODU Code. U.S. flag MODUs are subject to Coast Guard inspection requirements any time the vessel is operating (46 U.S.C. 3311). Therefore, unless "laid-up," a U.S. flag MODU must be in compliance with its COI regardless of its location or whether floating or bottom bearing. Consequently, regardless of the vessel's location, mode of operation, or type of international certificates the vessel may possess, a U.S. flag MODU will receive an inspection or reinspection annually.

2. IMO MODU Code

Introduction

a. On 26 July 1982, the Commandant advised the Secretary General of the IMO that the U.S. accepted the organization's MODU Code as equivalent to the requirements of SOLAS 74/78 for such vessels. As noted above, MODUs may comply with SOLAS or with the terms of the code itself. In addition, there will be a number of MODUs not subject to SOLAS for which IMO Code certificates are desired. Revision of Subchapter I-A has been initiated by Commandant (G-MOC). One of the stated objectives of the regulatory workplan is to dovetail Subchapter I-A with the IMO MODU Code.

Administration

b. Upon request of the vessel owner, U.S. MODUs should be inspected to verify compliance with the IMO Code. It is anticipated that such inspections will be conducted in conjunction with inspections for certification. Should a conflict exist between the IMO Code and the provisions of Subchapter I-A, the owner must request an exemption under paragraph 1.4 of the code or the Coast Guard must determine equivalency under paragraph 1.5 of the code. Upon satisfactory completion of the inspection, a MODU Safety Certificate, Form CG-5334, shall be issued to the vessel (see chapter 3 of this volume). The certificate should be dated to expire 2 years from the date of the inspection.

3. U.S. Flag MODUs Operating in Foreign Waters

a. Full compliance with the U.S. regulations may be difficult for units operating in foreign waters and subject to coastal state requirements. When another country's requirements conflict with ours, U.S. Coast Guard regulations shall take precedence unless specifically authorized by the cognizant OCMI.

Electrical Installations in Hazardous Locations

b. 46 CFR 111.105 requires explosion-proof and intrinsically safe systems to be "listed by Underwriters Laboratories, Inc., Factory Mutual Research Corp. or other independent laboratory acceptable to the Commandant." Other laboratories that are acceptable are the Canadian Standards Association (CSA) and MET Testing Laboratory. However, requiring electrical equipment to be listed by these North American laboratories is not always reasonable in foreign waters because such equipment may not be available, or it may not meet coastal state equipment listing requirements. For subcontractor equipment or other temporary installations, other independent laboratories are acceptable for listing explosion-proof equipment and intrinsically safe systems.

(1) *Subcontractor Services.* Drilling operations aboard MODUs often require subcontractor services. Subcontracted services include, among others, well logging, cementing, and casing perforation. Typically, these services are obtained locally by the leaseholder without regard to vessel flag. Contractor electrical equipment usually meets the certification requirements of the coastal state, and not necessarily those of the vessel's home administration. These installations are considered "temporary" although they may be installed for a few days or a few years.

(2) *Temporary Installations.* For temporary installations, equipment approved by an independent laboratory acceptable to the coastal state may be permitted by the OCMI in whose zone the vessel is operating. Where the coastal state has no certification requirements, equipment must be listed by one of the North American laboratories previously indicated, by one of the agencies listed at the end of this section, or by another agency acceptable to Commandant (G-MTH-2). In no case should equipment required by 46 CFR 111.105 to be listed, i.e., explosion-proof (flameproof) equipment or intrinsically safe systems, be permitted based on manufacturer or classification society certification. Upon return to U.S. waters and prior to engaging in OCS activities, MODU's must utilize equipment listed by one of the North American laboratories. Listed below are independent laboratories that are acceptable, provided they are recognized by the coastal state. This list is not intended to be all-inclusive; other laboratories acceptable to the coastal state may be acceptable.

Recognized International Testing Laboratories

Country	Symbol	Organization
Belgium	INIEX	Institut Nationale des Industries Extractives
Denmark	DEMKO	Danmarks elektriske materielkontrol
France	LCIE	Laboratoire centrale des industries electriques
	CERCHAR	Centre d'Etudes Recherches des Charbonnages de France
Italy	CESI	Centro Elettrotecnico Sperimentale Italiano
Norway	NEMKO	Norges Elektriske Materiallkontroll
U.K.	BASEEFA	British Approvals Service for Electrical Equipment in Flammable Atmospheres
Germany	PTB	Physikalisch-Technische Bundesanstalt
	BVS	Berggewerkschaftliche Versuchsstrecke

G. DRILLING TENDERS

1. Introduction

Artificial islands and structures erected on the OCS to support the development of mineral resources may be regarded as "places in the United States" for purposes of the navigation and vessel inspection laws. Accordingly, a drilling tender that is moored to one of these artificial islands or structures may be considered to be "at a port or place in the U.S."

2. Inspection Procedures

Special Agreements

a. Certain inspection agreements have been made with respect to drilling tenders engaged exclusively in providing power, machinery, and accommodations for material and personnel used in underwater drilling, mining, and related production operations. Such vessels are normally anchored for several months at a time at one location, and normally move only when proceeding to a new drilling site or a shipyard. Some of these vessels are self-propelled and others are not. They are all inspected and certificated under Subchapter I.

Drydocking

b. Procedures for extension of drydocking intervals are contained in chapter 8 of this volume. Requests received by an OCMI who did not conduct the last inspection for certification on the vessel should not be granted until approved by the certificating OCMI. Appropriate inspection of the vessel is a prerequisite to granting an extension in all but the most unusual circumstances. Underscantling vessels such as Landing Ships, Tank (LST's) should not be granted extensions.

Examinations of Tailshafts and Stern Tube Bearings

c. Due to their limited amount of time underway, drilling tenders need not have their tailshafts drawn for examination until the weardown exceeds the maximum permitted by 46 CFR 61.20-15. This should be handled on an individual basis, upon written request by the vessel owner. Extensions should be granted in writing, in a manner similar to an authorization to extend the drydocking interval. The date on which the tailshaft was last drawn shall be shown on the vessel's COI, with a notation concerning the extension.

Additional Requirements

d. The standards discussed above do not affect the prerogative of the OCMI to require drydocking or other inspection procedures at any time for cause. Copies of all owner requests and letters of authorization shall be sent to Commandant (G-MOC) and the last certificating OCMI.

3. Delivery of Excess Fuel to Drilling Platforms

Under 46 U.S.C. 3702(b), certain offshore supply vessels (OSVs) are permitted to transfer fuel from their own fuel tanks to offshore drilling or production facilities without being inspected and certificated as tank vessels. Specifically, 46 U.S.C. Chapter 37 does not apply to a documented vessel under these circumstances provided that the vessel in question is not more than 500 GT, it is not a tanker, and it is in the service of oil exploration. A requirement for this exemption is that the person in charge of transfer operations must be a certified tankerman.

H. OCEANOGRAPHIC RESEARCH VESSELS (ORVS)

1. Introduction

ORVs shall receive inspections for certification and reinspections in accordance with 46 CFR, Subchapter U (Oceanographic Research Vessels). Classification as an ORV requires a determination by the Coast Guard. In arriving at such a determination, an analysis of the particulars of service, method of operation, and classes of persons carried should be conducted. For uninspected vessels claimed to be less than 300 GT, tonnage measurement may be a part of this analysis.

2. Accom-modations

Accommodations for officers, crew, and scientific personnel shall comply with the requirements of 46 CFR 190.20. However, members of deck and engine groups that stand watch at the same time may be quartered together. In addition, special consideration shall be given to accommodations for scientific personnel carried on voyages of 14 days or less, provided the general intent of 46 CFR 190.20-5 is met. A space intended as a hospital space under the requirements of 46 CFR 190.20-35(a) may be used for ordinary berthing on voyages of 3 days or less.

3. Scientific Personnel

Scientific personnel are not classed as either "mariners" or as "members of the crew" but as "other persons" engaged on board for the purpose of conducting the business of the vessel. The carriage of scientific personnel shall be indicated by separate endorsement on the COI and reflected in the "Total Persons Allowed."

4. Uninspected Vessels Used as ORVs

Letters of Designation

a. Owners/operators of uninspected seagoing motor vessels of less than 300 GT, and any uninspected motor vessels operating on the Great Lakes, that are intended to be operated as ORVs may request a Letter of Designation as an ORV under 46 U.S.C. 2101(18). After determining that such a vessel is employed exclusively in oceanographic research, the OCMI shall issue a Letter of Designation valid for a period of 2 years (see Figure 10-2 for a sample letter). This letter designates the vessel as an ORV, and advises the owner/operator that the vessel must maintain exclusive employment in oceanographic/limnologic research or instruction and that any deviation from such exclusive use may constitute violations of the inspection statutes. In prior administrative rulings, the study of celestial navigation, seamanship, scuba diving, and other topics, in conjunction with oceanographic research or instruction, has voided a vessel's claim of exclusive employment. Additionally, a vessel documented as a pleasure vessel under 46 U.S.C. 12109 may not secure an ORV designation without surrendering its document, as the vessel would not be used exclusively for pleasure.

Evaluation by the OCMI

b. It is the Commandant's policy that the vessel should be able to retain its designation under 46 CFR 3.10-5 even though the terms of its charter or specific oceanographic work may vary periodically. However, if a change of employment or operating conditions deviates from exclusive oceanographic research/limnologic activities, the owner/operator or master must advise the OCMI who granted the designation. Taking into account the particulars of the case, the OCMI shall determine the eligibility of the vessel to retain its ORV designation based on its new employment/operations. If the vessel is not eligible to retain its ORV designation, it may be subject to inspection under (for example) Subchapter T or I. A formerly designated vessel, upon returning to bona fide oceanographic/limnologic activities, may be considered for a new ORV designation. If all operating conditions are as originally accepted, the information given for the initial request need not be resubmitted. Copies of the Letter of Designation shall be retained by the issuing OCMI and Commandant (G-MOC).

Research Operations Not Under a Letter of Designation

c. An uninspected seagoing motor vessel of less than 300 GT, or an uninspected motor vessel of any size operating on the Great Lakes, that does not possess a Letter of Designation may engage in oceanographic research operations, provided that such use does not violate applicable manning and inspection requirements. Such a vessel shall not be considered an ORV for purposes of 46 CFR 3, 14, 24, and 188-189. Furthermore, scientific personnel who serve in any capacity aboard an "undesignated" vessel of at least 100 GT require MMD's as members of the crew. Carriage of students would be considered carriage of "passengers"; this would compel inspection, depending on the size of the vessel and the number of students/passengers carried. The designation procedure is, however, purely voluntary in nature and needed only where equitable relief from otherwise applicable inspection or shipment and discharge requirements is desired.

Appeals of Evaluation

d. An adverse decision of an OCMI regarding any Letter of Designation request may be appealed to the district commander and to Commandant (G-MOC), according to the procedures outlined in 46 CFR 2.01-70.

FIGURE B4-2
SAMPLE LETTER OF DESIGNATION FOR AN

OCEANOGRAPHIC RESEARCH VESSEL

(On Official OCMI's Letterhead)

[Date]

Name of Vessel Owner/Operator]
[Address]

Subj: Letter of Designation as an Oceanographic Research Vessel,
[Name of Vessel and O.N.]

Dear Sir:

In accordance with the provisions of Title 46, United States Code, 2101 (18), the [Vessel Name and O.N.] is hereby designated an oceanographic research vessel. This designation shall remain in effect until [Date 2 Years From Date of Letter], provided the vessel does not change employment or deviate from engaging exclusively in oceanographic research operations. Any such changes or deviations may constitute violations of inspection laws and must be reported to this office by the master, owner, or agent of the vessel. A determination will then be made regarding the vessel's eligibility to retain this designation.

A request for renewal of this designation should be made by [date, 60 days prior to expiration]. This letter shall be maintained on board the vessel.

Sincerely,

[Signature]
[Title]

Copy: Commandant (G-MOC)
CCGDX(m)

5. Public Vessels Public (e.g., U.S. Navy and National Oceanic and Atmospheric Administration (NOAA)) vessels as defined in 46 U.S.C. 2101(24) operated for oceanographic research are not required to be inspected and certificated by the Coast Guard. However, such vessels may be inspected and certificated upon request by the parent agency and upon an interagency agreement to this effect. When public vessels are alternatively furnished a letter indicating some degree of compliance with the regulations, every effort should be made to obtain one compartment subdivision and damage stability calculations when only 100 percent lifeboatage is provided.

NOTE: Refer to MSM II, Section B, Chapter 5; Inspection of Public Vessels.

I. VESSELS IN IMMOBILE STATUS

1. Permanently Moored Vessels

Introduction and Coast Guard responsibility

a. The intent of this section is to give the COTP / OCMI overall guidance and philosophy on how to best address safety and risk management for permanently moored passenger vessels. Some examples of such PMVs are showboats, theaters, hotels, gaming sites, restaurants, museums, and business offices on a barge. The primary concerns for the Coast Guard COTP and OCMI are assessing the suitability of the site, and deciding if risks are best handled as a certificated vessel or through appropriate standards enforced by local building codes, fire marshal and other jurisdictions. In any case, it is the Coast Guard's obligation to ensure safety for all on or near the water.

Definitions

b. Vessel: A vessel is defined in 46 USC 2101(45) as "any watercraft or other artificial contrivance, used or capable of being used as a means of transportation on the water". A vessel taken out of transportation and permanently moored (or a PMV) falls somewhere between a statutory definition of a vessel and a building or land structure and is deemed to be "substantially a land structure."

Determination and Designation Process for a Passenger PMV

c. PMVs are vessels that are removed from navigation and are not inspected by the Coast Guard. They are vessels that would have received a COI had they stayed in navigation but instead have become "substantially a land structure". However, prior to receiving this designation they must satisfy the Coast Guard that appropriate safeguards are in place and must meet the following criteria:

(1) immobilized (cannot be moved except on a deliberate basis where extensive effort and equipment would be required) and removed from navigation;

(2) meet an acceptable risk assessment;

(3) permitted or otherwise authorized by the United States Army Corps of Engineers (USACE) for the site, and;

(4) appropriate safety standards and local oversight jurisdiction clearly established and designated in writing.

Immobilized and removed from navigation

d. A series of incidents in the spring of '98, where PMVs broke free from their moorings, highlighted the need to critically assess a PMVs mooring arrangements. COTPs should require a professional engineer or equivalent to evaluate the mooring arrangements of any PMV. The determination of the standard to which the mooring arrangements must be evaluated should be made during the risk assessment that is conducted prior to the vessel being placed in PMV status (see MSM II-B4.I.1.e). Consideration should be given to local 100 year storm winds, 100 year flood waters, range of high and low water, etc. Mooring arrangements should consider allision and breakaway risks, and may take into account risk mitigation measures such as protective pilings.

Initial Risk Assessment

e. An initial risk assessment is an integral part of all new USACE site permit reviews done by the CG (see USCG/USACE MOA in MSM Vol. X), or any decisions to allow a vessel to become a PMV. This initial risk assessment should consist of using the simplified risk model described in the next paragraph. Depending on the results of this initial risk assessment a more formal, technical risk analysis may be required by the COTP.

Risk Model

f. The risk model uses six parameters to quantify the risk to the vessel. The model is shown as appendix to this chapter. Rate the vessel on the six parameters as described in the "discussion column" on the risk model.

Formal Risk Assessment

g. If the results of the initial risk assessment result in a location score of 2 or below, or a total score of 13 or below(high risk), then the COTP has articulable grounds for calling the safety of the site location into question. At this point the COTP should exercise COTP authority under the Ports and Waterways Safety Act and require the vessel owner/operator to present a formal risk assessment if they wish to continue to pursue PMV status. Concurrently, the COTP must work with USACE to provide input into the site permit award process as described in the next paragraph.

New Site Permit

h. The USACE has the sole authority to issue vessel or facility siting permits. Per the USCG/USACE MOA in MSM Vol. X, the USACE will seek COTP input on new site permit applications and approvals at the earliest opportunity. The COTP should actively engage with the USACE in siting risk management. If the initial risk assessment indicates a safety problem then the COTP should require the vessel owner to present a formal risk assessment prior to the Coast Guard "signing off" on the USACE site permit process. The COTP should advise the USACE of this determination and recommend that a formal risk assessment be completed prior to granting the site permit.

Existing Site

i. If a vessel is being moved to an existing site that already has a USACE permit, the determination of whether or not to allow the vessel to become a PMV at that site is a Coast Guard decision. If the initial risk assessment indicates a safety problem then the COTP should require a formal risk assessment be conducted.

Risk Mitigation

j. A formal risk assessment should address the safety concerns identified in the initial risk assessment and include risk mitigation measures to reduce the level of risk to which the vessel is exposed. The COTP should remain open to options as risk mitigation measures can cover a broad spectrum of options, such as:

(1) Location: the first and most effective option is to alter the location to reduce or eliminate the risk of allision. However, in many cases site selection options are limited and other risk mitigation tools must be used such as the installation of protective bumpers or “icebreaker” type cells.

(2) Operational Controls: emergency options such as closing businesses in high water, radio watches for timely warning and evacuation in case of runaway vessels etc. may be use to reduce risk

(3) Response Preparedness: emergency exercises and drills on a frequent basis.

Turnover to Local or State Authorities

k. Once the decision has been made that the site is safe and if necessary, appropriate risk mitigation measures are in place, then there must be a transition between the Coast Guard and the local entity that will be taking over responsibility for the regulation of safety issues on the PMV. The COTP should meet with the local or state authority and ensure that appropriate safety standards and local jurisdiction are clearly established. Most local authorities are not well-versed in vessel safety issues and the COTP/OCMI should ensure that, at a minimum, the following issues are addressed in the hand-over to the local entity:

(1) Hull Integrity. The hull structure should be periodically evaluated. This can be accomplished by contracting services from a local surveyor if the local entity does not have the expertise to conduct the evaluation itself.

(2) Integrity of mooring arrangements.

(3) Emergency egress.

(3) Any lifesaving appliances that are part of risk mitigation measures.

(4) Any navigation related operational issues such as maintaining a radio watch.

Designation in writing

l. After the hand over of the PMV to local authorities the transition should be documented in writing by a letter to the local authority with copy to the vessel owner/ operator. This letter should state that the safety issues relating to the PMV have been turned over to the local entity and that the PMV is no longer under Coast Guard inspection.

Record PMV in database

m. The PMV should be loaded in the marine safety database under the vessel type “PMV”. A good deal of information about a PMV such as: location, the local authority responsible for the PMV, process issues like risk mitigation measures, etc. are not data fields normally associated with a vessel. This information should be recorded in the narrative supplement of the activity report that establishes the vessel as a PMV. If the PMV is an existing PMV, then an activity report should be created to capture this information.

Periodically Review PMV Site and Condition.

n. The COTP/OCMI should re-evaluate risks to permanently moored passenger vessels whenever there is a change of traffic, local conditions, etc., or at least every two years. The risk model described herein should be used for this purpose. In addition, the COTP/OCMI should also periodically visit the site and satisfy himself/herself that the vessel is being maintained in satisfactory condition particularly with those aspects of the PMV that are identified herein.

Change of Status

o. A vessel may be placed in navigation periodically, yet keep its status as "substantially a land structure" when moored. When returned to navigation, it becomes subject to inspection under the regulations applicable to its particular operation. The vessel owner/operator must notify the OCMI prior to placing the vessel in navigation. When the vessel is again immobilized, the COTP must again approve the site before the vessel can be considered "permanently moored." Once these conditions are met, the vessel would again be considered out of navigation. This procedure is intended to allow a permanently moored vessel to make infrequent trips for purposes of overhaul, drydocking, location changes, etc. This procedure is not intended to allow the "permanent" mooring of a vessel that is placed in navigation on a regular basis (e.g., on weekly or monthly trips between ports). When intended operations are tantamount to use as a vessel normally requiring inspection, claims of status as substantially a land structure are voided and the structure must be inspected and certificated.

Permanently Moored Passenger Vessel Initial Risk Assessment

Name of Vessel: _____

Location: _____

Passenger Capacity: _____

The risk model use uses six parameters to quantify the risk to the vessel. The parameters are designed to capture the key risk elements associated with permanently moored vessels. Each of the six parameters is scored on a scale of one to five. A low score indicates an undesirable condition and conversely, a high score indicates a desirable situation**. Therefore, based on the six parameters, a vessel could receive a maximum total score of 30 and a minimum total score of 6.**

Rate the vessel on the six parameters as described in the "discussion column" using the following values as a rough guide: 1 = Poor 2 = Fair 3 = Good 4 = Excellent 5 = Outstanding

CATEGORY	VALUE	DISCUSSION
Location		Value based on the vessel's site location in terms of the risk the vessel is exposed to from a collision or allision. E.g., 1 = vessel sited on the outside bend of a river; 5 = boat in a moat. **Other considerations / mitigating factors:** **If total score is 2 or less:** Involve vessel owner /operator and review further risk mitigation actions. If score is still 2 or less, require owner to present a formal risk assessment.
Traffic		Value based on the amount/type/activities of vessel traffic adjacent to the PMV. Factors to consider - amount, size and frequency of traffic; speed of traffic/current; maneuvering constraints/limitations; vessel service. **Other considerations/ mitigating factors:**
Response		Value based on the ability of local maritime response community (including Federal, State and local governments) to provide timely, adequate assistance to disabled/damaged vessels. **Other considerations/ mitigating factors:**
Anticipated environmental factors		Value based on the duration a vessel may be exposed to high risk due to anticipated environmental factors that occur annually, such as fog, river flood stage, storms, etc. E.g. 1 = 4+ weeks/yr.; 5 = 0-1 week/yr. **Other considerations/ mitigating factors:**
Severe and sudden environmental factors		Value based on how often vessel could be at risk due to unpredictable sudden and severe environmental factors such as hurricane, flash flood, tornado. E.g. 1 = anticipated annual occurrence; 3 = occasional (every 5 - 10 yr.); 5 = unlikely (never occurred but possible). **Other considerations / mitigating factors:**
Passenger exposure		Value based on the amount of time and the number of passengers to which a vessel is accessible per week. E.g. 1 = 100,000 passenger-hours/wk.; 5 = 2000 passenger-hours/wk. **Other considerations/ mitigating factors:**

TOTAL		**If total score is 13 or less:** Involve vessel owner/operator and review risk mitigation actions. If score is still 13 or less, require owner to present a formal risk assessment.

J. BOY SCOUT VESSELS

1. Introduction

To assist local Boy Scout councils, chartering organizations, and leaders in complying with Coast Guard inspection regulations, the Boy Scouts of America's Exploring Division and the Coast Guard entered into formal agreement on 1 October 1979. Although the agreement principally addresses the Sea Explorer program, it applies equally to all vessels operated in the interests of the Boy Scouts of America (BSA). The Exploring Division intends that all Sea Explorer vessels, except pulling boats carrying no more than six passengers, will be inspected and certificated.

2. Inspection Procedures

Vessels Inspected Under Subchapter T

a. All Sea Explorer vessels under 100 GT that carry more than six Scouts shall be inspected and certificated under Subchapter T. These vessels are subject to inspection because the Scouts carried are considered to be passengers, as defined in 46 U.S.C. 2101(21)(B). In the past, a strict interpretation of the law did not require inspection and certification of vessels over 65 feet in length used exclusively for Sea Explorer activities. However, to ensure maximum safety, it was BSA policy that all Sea Explorer vessels over 65 feet possess a valid COI when carrying more than six persons in addition to the crew. Therefore, Sea Explorer vessels over 65 feet in length are now required to be inspected and certificated (46 U.S.C. 3301). The section of the 1 October 1979 agreement with BSA that deals with these vessels will be revised to reflect that change.

Vessels Inspected Under Agreement

b. Sea Explorer vessels of more than 100 GT, although not required to be inspected under 46 U.S.C. 3301 et seq., because they do not meet the definition of "passenger vessels," are inspected and certificated in accordance with the existing agreement with BSA. They may be inspected under the Subchapter T standards. Where these standards are inadequate, the provisions of Subchapters F (Marine Engineering), H (Passenger Vessels), and J (Electrical Engineering) may be used.

NOTE: Seagoing motor vessels over 300 GT operated by the Sea Explorers are required to be inspected under 46 U.S.C. 3301 et seq.]

Uninspected Sea Explorer Vessels

c. Sea Explorers engaged in the rowing of pulling boats are not considered passengers. Therefore, pulling boats are not required to be inspected for certification. Likewise, boats of less than 100 GT carrying six or less Sea Explorers (in addition to the crew) do not require certification. All Sea Explorer vessels not inspected under Subchapter T must comply with the appropriate requirements of Subchapter C (Uninspected Vessels). Annual application for a CG Auxiliary Courtesy Motorboat Examination is encouraged.

Manning

d. Certificated Sea Explorer vessels, whether sail or machinery propelled, shall not be operated without the minimum manning specified on the COI. The OCMI certificating the vessel shall determine minimum manning requirements. The OCMI may tailor license examinations to cover minimum professional requirements only, and may restrict the licensee to a particular vessel. The OCMI may permit Sea Explorers to be carried as crewmembers (deckhands) aboard Sea Explorer vessels. The OCMI shall consider the number of passengers carried, route, and general arrangement, in addition to the size of the vessel. The following guidelines are minimum requirements:

Vessel Type & Size	Required Manning
Sailing Vessels < 26 Feet	1 Operator, 2 Deckhands
Sailing Vessels ≥26 Feet	1 Operator, 4 Deckhands
Power Vessels < 26 Feet	1 Operator, 1 Deckhand
Power Vessels ≥ 26 Feet And Larger	1 Operator, 2 Deckhands

NOTE: When a vessel is cruising for more than 12 hours of continuous operation, the preceding minimum crew guidelines shall be doubled to provide two separate watches. Powered vessels not having engine controls at the steering station shall require at least one additional crewmember to provide engine control.

3. Special Situations

46 CFR 175.25-1 provides that the OCMI may consider departures from specific requirements when special circumstances or arrangements so warrant.

4. Right to Appeal

46 CFR 175.30-1 provides for appeal of decisions or actions of the OCMI. In addition, district commanders may arrange for a method of informal dispute settlement for minor disagreements.

5. Assistance from Coast Guard Marine Inspectors

When vessels will be acquired for Sea Explorer use, a marine inspector from the appropriate marine safety unit should be invited by the National Sea Exploring Committee, or the BSA regional office or local council to assist in the examination of the vessel. The inspector will be able to affirm the vessel's general suitability for the Sea Explorer program and indicate the requirements it must meet for certification.

6. Establishment of Agreements and Liaison

The BSA administrator of this agreement is the Director, National Sea Exploring Committee. All matters between the Coast Guard and Sea Explorers of national scope are resolved between the Commandant (or the Commandant's designee) and the National Sea Exploring Committee (or its designee). Liaison between BSA's regional officials and Coast Guard district commanders for the implementation of this agreement by local councils, chartered organizations, and Sea Explorer leaders is the responsibility of the regional director or the director's designee. Liaison responsibilities include resolution of disputes and recognition of significant local conditions.

K. CABLE-LAYING SHIPS

A cable-laying ship is subject to the requirements of Subchapter I. Regulation 3, Chapter I of SOLAS 74 and the 1978 Protocol to the convention do not refer to cable-laying ships or similar types concerning exemptions from SOLAS requirements. Therefore, such vessels, when documented, are subject to SOLAS 74/78 even though they cannot be categorized strictly as either passenger or cargo vessels. The Commandant will require the minimum arrangements that, considering the particular vessel's service and safety elements inherent in its design and construction, can be considered equivalent to the requirements of SOLAS 74/78. Suitable notice of equivalency must be given as provided by Regulation 5, Chapter I of SOLAS 74/78.

L. ELEVATOR VESSELS

The term "elevator vessel," as used in 46 CFR 146.02-2(f)(5), means a harbor service vessel that services cargo vessels by loading and offloading bulk cargo, such as grain and ores, by means of elevator buckets. This type of vessel is classed with cable vessels, dredges, fireboats, icebreakers, pile drivers, pilot boats, and welding vessels (none of which carries freight for hire as a "cargo ship") as miscellaneous vessels inspected and certificated under Subchapter I.

M. RECREATIONAL BOATS RENTED FROM LIVERIES

It is not uncommon for liveries to rent recreational boats, including those propelled by outboard motors, to persons unfamiliar with federal safety requirements. In some cases, when a deposit is required by the livery for the return of lifesaving or other safety equipment, renters decline to accept the equipment and take the boats without it. As a result, everyone aboard is deprived of the protection such equipment provides. Under 46 U.S.C. 4311, responsibility is placed solely on the operator of a recreational vessel to ensure that the proper safety equipment is aboard. Livery operators should advise their customers that failure to have the required equipment aboard a recreational vessel places the boat operator in violation of 33 C.F.R. 175, and operators should be encouraged to have the proper safety equipment on board.

N. APPROVAL PROCEDURES FOR SPECIAL-TYPE CRAFT OR UNUSUAL DESIGNS

1. Introduction

The Coast Guard is occasionally requested to certificate various vessels of unusual design, such as catamarans, hydrofoil surface effect ships, etc., or traditional types (such as sailing vessels and sailing auxiliaries) that incorporate innovative features requiring detailed evaluation. Experience in the operation of such craft may be very limited or totally lacking. Current regulations are based upon experiences with conventional craft, and may be unreasonable or inadequate when applied to unique or unusual designs; available engineering data may also have limited applicability. For these reasons, such craft should be certificated only upon careful evaluation of the proposed design(s) or feature(s).

2. Administration of Requests

When a request is received for certification of a special-type craft or an unusual design, pertinent plans, specifications, and design calculations shall be forwarded to the Marine Safety Center (MSC) for evaluation and approval. Elements considered by the MSC to be beyond its capabilities or expertise, or which require important policy decisions, shall be forwarded to Commandant (G-MOC) for evaluation and approval. In any case, the overall degree of safety shall not be less than the minimum attained by requirements applicable to conventional craft.

O. INTEGRATED TUG BARGES (ITBS)

See Navigation and Vessel Inspection Circular (NVIC) 2-81, "Coast Guard Guidance Regarding Integrated Tug Barge Combinations," and its Change-1.

P. OIL RECOVERY VESSELS

1. Introduction

Vessels built for the purpose of cleaning up spilled oil are of special interest to the Coast Guard. While the building and deployment of these vessels should be encouraged, they must be able to operate safely in areas where flammable vapors are present. Oil recovery vessels present unique problems from a regulatory standpoint. They are designed to carry various grades of oil (usually mixed with water) as cargo for short periods of time, often in a potentially hazardous environment. They are generally small vessels, with minimal crews who may be required to operate far from port under poor weather conditions. The primary safety concern for oil recovery vessels is the ignition of flammable vapors from oil spilled on the water and collected oil stored aboard. The hazard from oil on the water surface may be mitigated by weather conditions and elapsed time prior to cleanup. Likewise, collected oil is usually mixed with water, posing a lesser vapor hazard than does oil alone. In short, the hazard from vapor ignition is variable and difficult to ascertain. One design approach is to require the vessel to have no ignition sources for operation in a hazardous environment. Practically, however, it is extremely difficult to construct and maintain a vessel totally void of ignition sources. These vessels should be considered to have potential ignition sources, and should require the same operational restrictions as other vessels in spill areas.

2. Inspection Criteria

The following criteria shall be applied to oil recovery vessels in plan review and certification:

a. A vessel with no on board oil-holding capacity shall be inspected under Subchapter I only if the gross tonnage or the means of propulsion so require. Otherwise, the vessel shall be uninspected.

b. A vessel with an oil-holding capacity less than or equal to 20 percent of the deadweight tonnage shall be inspected under Subchapter I. Such amounts of oil shall be considered as "limited quantities" under 46 CFR 30.01-5 and 90.05-35.

c. A vessel with a holding capacity greater than 20 percent of the deadweight tonnage shall be inspected under Subchapter D (Tank Vessels).

d. When holding recovered oil, a vessel certificated under Subchapter I shall meet the requirements of Subchapter D.

e. Enclosed machinery spaces shall be provided with positive ventilation.

NOTE: For vessels under 100 GT, it may be appropriate to apply specific requirements of Subchapter T in lieu of comparable requirements under Subchapter F or J. Such application shall be done on a case-by-case basis by the OCMI, depending upon the design specifics of the vessel.

3. Hazardous Location Equipment

The following comments regarding "hazardous location equipment" shall apply:

a. Electrical equipment installations should be kept to a minimum. Hydraulically-powered equipment should be used when available (e.g., hydraulically-powered cargo pumps).

b. Where electrical equipment is employed (switches, lights, solenoid valves, etc.), it must be one of the following types:

(1) Spark ignitionproof (Underwriters Laboratories, Inc. (UL) 1500);

(2) Explosion-proof (various); or

(3) Intrinsically safe (UL 913).

NOTE: The UL listing "spark ignitionproof" (UL 1500) employs a standard that is based on part of the explosion-proof test. Those electrical devices that do not create sparks in normal operation (lights, solenoids, etc.) are inherently "spark ignitionproof" and should obtain UL listing.

c. Enclosed machinery spaces must be ventilated at a rate of at least 20 changes of air per hour by fans designated as "nonsparking" under the provisions of either 46 CFR 110.15-1(b)(16) or subparagraph MSM II-A3.K.3.b above.

d. Belt drives must use conducting belts, pulleys, and shafts to prevent the buildup of static electrical charges.

e. Machinery exhausts must be fitted with spark arrestors.

f. All exposed surfaces (machinery, light lenses, etc.) must be maintained at a temperature below 400oF. When these surfaces are normally accessible to personnel they must be maintained below 150oF for personnel protection.

g. Oil tank vents must be fitted with flame screens and must have a cross sectional area at least as large as the fill lines.

NOTE: Most oil recovery vessels are designed for use with Grades D and E liquids. If use with more flammable grades or with hazardous chemicals is desired, Commandant (G-MTH) should be consulted. Vessels engaged in other service when not operating as oil recovery vessels must meet normal requirements for that service.

4. Endorsements on the COI

The COI shall state that the vessel is an oil recovery vessel. The endorsement for route should be as broad as possible, consistent with the considerations of seaworthiness. Oil recovery vessels may be expected to respond to pollution incidents at great distances from their home ports, often in open sea conditions. When engaged in recovery operations, they are normally in close proximity to other vessels, and a restricted route would be neither desirable nor necessary. The COI will normally be endorsed for the recovery of a specific grade of oil, as is done with tank vessels. However, oil that is of a higher grade may have the reduced ignition potential of a lower grade after weathering. Therefore, the COI should include a statement such as, "Approved for the recovery of Grade and lower. Higher grades may be recovered, on a case-by-case basis, as determined by the OCMI/COTP after consideration of the special circumstances of each recovery operation." Such factors as temperature, wind velocity, and time since spillage shall be considered in permitting the recovery of higher grades of oil.

Q. SMALL MECHANICALLY FASTENED SHALLOW WATER OIL SPILL RESPONSE VESSELS (OSRVS)

1. Introduction

A national response organization, namely Marine Spill Response Corporation (MSRC) has developed and constructed small OSRVs for use in shallow water oil spill responses. Commandant G-MOC has conducted conceptual review and the Marine Safety Center has conducted plan and stability review of these OSRVs. These OSRVs are unique in that they are normally stored on land, capable of being trailered, launched, and outfitted at a spill site. The launching and outfitting includes joining two barges together to form a single stable OSRV of approximately 25 gross tons. Since the combined tonnage exceeds 15 gross tons Commandant G-MOC has determined that these OSRVs are subject to inspection for certification as small recovery vessels.

2. General Requirements

The inspection standards identified during the conceptual review for the MSRC OSRVs are contained in MVI Policy Ltr No. 03-92. Depending on whether the vessel is self-propelled or not, outfitting equipment may include life saving, fire fighting, cargo tank venting, cargo piping, navigation equipment, bilge pump, propulsion unit, crane, and hand rails. These OSRVs are subject to inspection as small recovery vessels, except; machinery and electrical may meet the requirements for a skimming vessel. The bilge pump and fire fighting equipment may be portable (barge), or semi-portable (self-propelled). Toilets and wash basins are not required, provided a tending vessel provides this service. The MSRC OSRVs are limited to operations not more than one mile from land due to the structural integrity of the connection devices.

3. Inspection

Officers-in-Charge, Marine Inspections (OCMIs) should satisfy themselves that the subject OSRVs are fit for the intended service. These OSRVs are stored in groups of eight barges. Recognizing that the individual barges are interchangeable provides merit to not requiring all of the barges to be completely outfitted, unless differences are noted. As a minimum, the self-propelled unit should be outfitted and demonstrated, and required equipment and paperwork for all of the barges examined/inspected. MSRC has provided stenciled equipment boxes for self-propelled and non-self-propelled configurations, which will facilitate the inventory of the equipment. The amount of equipment provided should match the intended number and type of vessels. Since the barge sections are interchangeable, the lifesaving equipment may be stenciled in a generic fashion, to show it belongs to the group of vessels.

4. COI Endorsement

Figure B4-Q-1 below is offered as a standard COI endorsement for the MSRC shallow water OSRVs.

Figure B4.Q-1.

COASTWISE: NOT MORE THAN ONE (1) MILE FROM LAND

AUTHORIZED TO CARRY RECOVERED OILS OF GRADE "B" WITH A SPECIFIC GRAVITY OF 1.05 OR LOWER. THE MAXIMUM DRAFT IS 2 FEET 10 INCHES. VESSEL MAY

NOT OPERATE IN A HAZARDOUS ATMOSPHERE. CONTINUOUS MONITORING MUST BE EMPLOYED ON MANNED VESSELS WHEN RESPONDING TO OIL SPILLS OF GRADE "B" & "C."

ONE (1) CERTIFIED TANKERMAN SHALL BE PROVIDED DURING ALL CARGO TRANSFER OPERATIONS.

PRIOR TO OPERATION AS A OIL SPILL RECOVERY BARGE:

1. MUST BE OPERATED WHILE MECHANICALLY FASTENED TO A SINGLE VESSEL OF THE SAME DESIGN AND CONSTRUCTION.

2. PRESSURE-VACUUM VALVES AND RECOVERED OIL PIPING AND VALVES MUST BE INSTALLED.

3. CLEATS AND DECK FITTINGS MUST BE INSTALLED.

4. NAVIGATION LIGHTS MUST BE INSTALLED.

5. DURING ALL MANNED CARGO OPERATIONS, THE BARGE SHALL BE EQUIPPED WITH HAND RAILS, ONE RING BOUY WITH LIGHT AND LINE, ONE TYPE I PFD FOR EACH PERSON ON BOARD, A PORTABLE BILGE PUMP WITH SUITABLE SUCTION AND DISCHARGE HOSE AND TWO B-II PORTABLE FIRE EXTINGUISHERS MUST BE INSTALLED.

PRIOR TO OPERATION AS A SELF-PROPELLED VESSEL, THE FOLLOWING ADDITIONAL ITEMS MUST BE PROVIDED:

1. ONE PORTABLE COMBUSTIBLE GAS METER FOR MONITORING ATMOSPHERE OR TANK VAPOR CONCENTRATIONS.

2. IN LIEU OF TWO B-II PORTABLE FIRE EXTINGUISHERS; ONE B-V SEMI-PORTABLE AND ONE B-II PORTABLE FIRE EXTINGUISHER SHALL BE PROVIDED.

3. WHEN MANNED A SUITABLE TENDING VESSEL WITH ADEQUATE SANITARY FACILITIES MUST BE PROVIDED.

4. THE MAXIMUM DRAFT IS 2 FEET 8 INCHES WHEN OPERATING IN THE SELF-PROPELLED MODE.

5. THE CRANE IS TO BE OPERATED IN ACCORDANCE WITH THE CAPACITY CHARTS BEARING U.S. COAST GUARD MARINE SAFETY CENTER APPROVAL STAMP DATED 25 JULY 1994.

6. WHEN OPERATING AS A SELF-PROPELLED VESSEL, THE VESSEL MUST BE MANNED WITH ONE MASTER AND A DECKHAND; HOWEVER, WHEN OPERATING OVER 12 HOURS IN ANY 24 HOUR PERIOD AN ALTERNATE CREW MUST BE PROVIDED TO SERVE IN A TWO WATCH ROTATION.

NOTE: The above endorsements are specific to the MSRC OSRVs. These endorsements serve as an example for other small shallow water OSRVs that may operate in a similar fashion, however endorsements must be modified based on each specific vessel/operation.

5. Manning

The proposed manning for 12-hour operations of the self-propelled vessel was a licensed master and a deckhand. Due to the relatively small size of these vessels, the master may act as the person-in-charge of transfer while navigating the OSRV, provided the master does not have to participate in manual tasks associated with the transfer. The adequacy of the manning level should be demonstrated during the OSRV's trials and must be sufficient to comply with the work hour limits of Title 46, U.S.C. 8104 (n). Deviations from the proposed manning level should be forwarded to Commandant (G-MOC) for final determination.

R. LANDING CRAFT-TYPE VESSELS

Landing craft used by the armed services in wartime are obviously designed for special purposes. They are of lighter construction than merchant ships, and the opening-bow design of most types presents structural integrity problems not found on conventional vessels. The Commandant strongly discourages the use of these vessels for commercial service. When landing craft are permitted to be used commercially, special consideration must be given to their suitability for the proposed operation. In some instances, the hull structure has been required to be strengthened before the vessel is certificated. In all cases in which ex-landing craft have been permitted to carry passengers, and in most cases in which they are permitted to carry cargo, a requirement has been made for the permanent closure of bow doors. For those cargo carriers on which bow doors were retained, indiscriminate beaching has not been permitted and suitable shore facilities must be provided. OCMI's shall continue to give particular attention to vessels of landing craft types. The construction, arrangement, equipage, and material condition of each particular vessel shall be considered in determining its suitability for the proposed operation. Each new request for inspection of such a vessel must be evaluated on its own merits. Unless covered by the following provisions, each new request should be referred to Commandant (G-MOC) with appropriate recommendations from the OCMI.

1. LSTs

NVIC 7-56 and NVIC 11-63 contain instructions concerning the structural reinforcement, drydocking, and hull inspection of manned and unmanned LST's, respectively. Since the issuance of these NVIC's, additional requirements have been applied. Hull bottom reinforcement, in addition to that shown in Figure 1 of NVIC 7-56, is required to provide at least 14 square inches of additional bottom plating sectional area on each side of the centerline. This may be provided by strapping, or by increasing the width of the 9/16-inch thick strakes at the centerline and in way of the longitudinal bulkheads. Existing machinery, pressure vessels, piping systems, electrical installations, lifesaving and firefighting equipment, etc., that will not be used must be removed or inactivated. Any original equipment or systems designed for use in the proposed service shall comply with the applicable regulations. Full detail plans of all modifications of the basic LST structure and configuration, including those called for in NVIC 7-56, NVIC 11-63, and this section, shall be approved by the Marine Safety Center (MSC) before inspection for certification. These plans should be submitted well in advance of anticipated alterations or operations to permit adequate review and lead time for work.

2. Other Types of Craft

Landing Crafts, Utility (LCU's), Medium (LCM's), and Tank (LCT's) with bow doors in use have been permitted to carry cargo on waters considered to be semi-protected, provided that:

a. The OCMI is satisfied as to the material condition of the vessel and its degree of meeting equipment requirements.

b. Appropriate conditions and limitations, including the qualification of routes to reasonable operating conditions, are stated on the COI.

c. Provisions are made to waive reporting requirements in instances of routine intentional grounding. The following statement shall be entered on the COI of a landing craft: "Notice of casualty in accordance with 46 CFR 97.07-1(a)(3) shall be made for any accidental stranding or grounding and for any intentional grounding that causes, or is suspected of having caused, damage affecting the seaworthiness of the vessel."

d. The cargo capacity of such vessels shall not exceed that prescribed by the following table:

Vessel Type & Length	Protected Waters / No Beaching Waters	Semi-Protected Waters / Beaching
LCM (50, 56 ft.)	30 Tons (Short)	20 Tons
LCT (117, 120 ft.)150 Tons	100 Tons	

e. Cargo must be loaded low in the vessel, well within the side walls, and properly lashed and stowed. The use of cranes on board these vessels should not be permitted without stability calculations being submitted.

f. Bow and stern sections of LCT's shall be welded to center sections.

3. DUKWs

These World War II-vintage amphibious craft are equipped with radiator cooled engines. Departures from 46 CFR 182.15-10 (which prohibits radiator cooled engines in vessels) are authorized due to the DUKWs unique arrangement, provided a temperature indicator and an alarm are installed (see subparagraph B.2.j above).

S. YACHTS

1. Application of Inspection Laws

Although normally operated as recreational vessels, yachts may be subject to inspection as seagoing motor or steam vessels, depending on the vessel size and area of operation.

2. Steam-Propelled Yachts

A "steam vessel" is defined under 46 U.S.C. 2101(37). Steam vessels are subject to inspection under 46 U.S.C. 3301. Steam-propelled yachts (recreational vessels) more than 65 feet overall in length are subject to inspection. Steam-propelled yachts more than 40 feet in length, but not more than 65 feet overall in length, only require inspection with respect to their boiler, engine, and other operating machinery, per 46 U.S.C. 3302(k).

3. Motor-Propelled Yachts

Motor-propelled yachts of at least 300 GT making voyages beyond the boundary line defined in 46 CFR 7 are, by definition, "seagoing motor vessels" subject to inspection under 46 U.S.C. 3301. Such vessels shall be inspected under Subchapter I.

4. Manning Requirements

➔ See MSM Volume III.

T. FISHING AND FISHERY-RELATED VESSELS

1. Introduction

Fishing vessels, fish processing vessels, and fish tender vessels, as defined in 46 U.S.C. 2101(11)(a), (b), and (c), respectively, may be exempt from vessel inspection requirements and most manning standards by specific wording in 46 U.S.C. 3302(b), (c)(1) and (2), 3304(d), and 3702(c) and (d). Basically, size, propulsion, and service or use of a vessel determines whether or not it is subject to inspection and manning regulations.

2. Determination of Exemptions

Determining the applicability of these exemptions from the various standards to all the different vessel types, fisheries, and locations can be difficult. Figure 10-3 provides a tabulation of the different requirements and is intended to assist in decision-making; it is not necessarily all-inclusive. Questions should be directed to the district commander (m) or Commandant (G-MOC). For uninspected vessels to which manning standards apply, reasonable attempts should be made to verify compliance. Boardings of opportunity in conjunction with casualty and pollution investigations, enforcement of laws and treaties (ELT) and search and rescue (SAR) assistance cases, etc., can be used to this end.

3. Reporting Requirements

Since the need for these vessel-specific exemptions and their impact on safety is periodically reviewed by the Congress, it is important that the Commandant have accurate information on the casualty records of exempted vessels. Whenever possible, casualty investigation reports should identify vessels known to be within these exemption categories. Likewise, any information obtained locally that is relevant to this issue should be forwarded to Commandant (G-MOC).

4. Safety and Lifesaving Equipment on Fishing Vessels

- All safety and lifesaving equipment in excess of that required by 46 CFR Part 28, whether an approved type or not, carried onboard any commercial fishing industry vessel must be;
- maintained and inspected as required by regulation and in compliance with the manufacturer's guidelines; or
- distinctly and permanently marked as to be used ONLY for training if not meeting the maintenance and inspection standards; or
- removed from the vessel if not meeting the maintenance and inspection standards.

SPECIAL NOTE: All excess safety or lifesaving equipment retained onboard a vessel for training purposes shall be stowed in such a manner or location that it will not be mistakenly utilized during an actual emergency.

5. Notes on the Statutes and Regulations Pertaining to Fishing and Fishery-Related Vessels

a. Fishing vessels, tenders, and processors exempted from inspection by 46 U.S.C. 3302 are not exempt from all manning requirements. See 46 U.S.C. 8103, 8104, 8301, 8701, and 8702. If the vessel has a COI, 46 U.S.C. 8101 applies. The implementing regulations are contained in 46 CFR 157.

b. The Officers' Competency Certificates Convention, 1936 is implemented by 46 U.S.C. 8304, and applies to vessels in this category that are of 200 or more GT. The implementing regulations are contained in 46 CFR 157.18.

c. Vessels in this category of 100 GT or less are subject to 46 U.S.C. 8901. The implementing regulations are contained in 46 CFR, Subchapter T.

d. Vessels in this category constructed before 1 January 1980, and vessels aboard which conversion for such use was begun before 1 January 1980 (and completed prior to 1 January 1983) are not required to have a coastwise load line assigned. See 46 U.S.C. Chapters 51 and 141.

e. All vessels in this category constructed before 15 August 1974 or converted for such use before 1 January 1983 are not required to have a coastwise load line assigned. See 46 U.S.C. Chapters 51 and 141.

f. Vessels engaged in foreign voyages or international voyages that are "new vessels" 79 or more feet in length, or "existing vessels" of 150 or more GT, are required to have a load line. See 46 U.S.C. Chapters 51 and 141.

g. Fishing and fish tender vessels of not more than 500 GT engaged in only the fishing industry are exempt from the requirements of 46 U.S.C. Chapter 37.

U. RIVER-RUNNING VESSELS

1. Introduction

The 1970's saw a tremendous national upsurge in commercial river-running activities, commonly referred to as "white water rafting." This enterprise involves an expedition of non-self-propelled boats (usually inflatable rafts), floating down streams marked by rapids of varying degrees of difficulty. These expeditions may last from several hours to several days. Expeditions on relatively calm waters offer novice adventurers the enjoyment of a wilderness journey, while rougher waters offer the thrill of "shooting the rapids." As some river-running operations carry passengers for hire on navigable waters of the U.S., they fall within the purview of 46 U.S.C. Chapters 33, 41, or 42 and, consequently, the regulations in 46 CFR, Subchapters C and T. As these regulations do not directly address river-running operations, a project was initiated to develop suitable regulations and a program for inspection and licensing.

> **NOTE:** The only requirements that apply specifically to white water activities are: have Type I or Type V (Special Purpose) personal flotation devices for each person aboard, and conduct safety orientation for passengers.

2. Program Evaluation

After considerable study, it became apparent that a new regulatory program was unnecessary and inappropriate. White water rafting is generally a thrill-type, inherently risky activity in which participants willingly seek an exciting adventure. Nevertheless, the industry has a good safety record, attributable in part to regulation by federal and state agencies (U.S. Department of the Interior, state boating safety administrators, etc.) and the guidance of rafting owner/operator trade associations. The occasional accidents that occur are not likely to be prevented by a Coast Guard inspection program. Further, because of the distances from most marine safety units to "wild river" areas, the Coast Guard would incur large increases in operating costs with little tangible improvement in safety. Therefore, inspection and licensing action will not be undertaken for commercial white water activities. Future efforts regarding these activities will be initiated to encourage the states (and, on federally-owned lands, cognizant federal agencies) to oversee white water activities.

3. Discretion of OCMIs

It is stressed that this policy does not abrogate Coast Guard authority over white water rafting. The OCMI should be aware of such activities in his or her zone, and should exercise jurisdiction if a specific problem demands corrective action at the local level. Inspection and licensing efforts should not be initiated without prior approval of Commandant (G-MOC). Casualties involving loss of life should be investigated with possible recourse to civil penalty proceedings for negligent operation under 46 U.S.C. 2302.

V. OCEAN INCINERATION VESSELS

1. Introduction

With the advent of stricter environmental controls on the disposal of hazardous wastes, ocean incineration has become a topic of greatly increased interest. This, like land-based incineration, is a high-temperature combustion process; however, it is performed on special-purpose vessels. Wastes disposed of in this manner are organic compounds, most commonly chlorinated hydrocarbon wastes, that are difficult to destroy by other processes and that produce highly acidic combustive wastes. The burning process itself is conducted at specific ocean sites that have been designated by the Environmental Protection Agency (EPA). One site is presently located in the Gulf of Mexico; another has been proposed in the Atlantic Ocean. U.S. involvement in the ocean incineration concept began in the early 1970's, when the Singapore registered vessel VULCANUS (renamed VULCANUS I) was employed to dispose of chlorinated hydrocarbon wastes for the Shell Oil Company. Since that time, VULCANUS I and now VULCANUS II have burned polychlorinated biphenyls (PCB's) and the herbicide 2,4,5-T ("Agent Orange").

2. Federal Controls

The EPA and the Maritime Administration (MARAD) established an interagency working group in which the Coast Guard participated. This group considered the environmental impacts of the ocean incineration process, its economic feasibility, possible government actions to encourage development of a U.S. incineration fleet, and presently applicable regulations. It was determined that the only government support for such development existed in MARAD construction loan guarantees. The EPA is responsible for incinerator efficiency, designations of burning sites, and enforcement of waste disposal requirements. The Coast Guard is responsible for approving the designs of such vessels, ensuring that they are maintained to acceptable standards, overseeing loading operations, and assisting the EPA in enforcement activities.

3. Coast Guard Enforcement Measures

A rider to the Fisheries Act Amendments of 1982, which became effective on 29 December 1982, places U.S. incineration activities under the protection of the Jones Act and restricts burning of U.S. wastes to U.S. vessels. Special exemptions have been given to the VULCANUS I and VULCANUS II; the latter, under Liberian registry, will operate principally from Mobile, Alabama. However, these vessels operate under COI's and are subject to drydock examinations and inspections to ensure their maintenance to the same standards as U.S. incinerator vessels. Coast Guard COTP personnel also monitor loading operations and assist in enforcement activities. Special inspection procedures may be required to ensure adequate protection for Coast Guard personnel. Commandant (G-MOC-2) will provide specific guidance when the VULCANUS I and VULCANUS II are due to be inspected.

W. LAUNCHES AND LIFEBOAT USES

1. Passenger Vessels—Launches

Foreign flag vessels occasionally use their own launches or lifeboats to ferry passengers ashore. Such use of ship's boats to ferry passengers between a passenger vessel and shore constitutes the carriage of passengers for hire. Operations and manning, including licensed operators, shall be in accordance with the regulations for passenger vessels. Some foreign flag states issue Lifeboat/Tender Safety Equipment Certificates to lifeboats used as passenger launches. Although these certificates are not SOLAS certificates, they certify that the boat meets an equivalent level of safety in view of its limited route and service. These launch certificates are considered certificates of inspection issued by the flag state (see 46 U.S.C. 3303). Foreign flag launches which have SOLAS Passenger Ship Safety Certificates or unexpired certificates of inspection issued by proper authority of its respective country are subject to Control Verification procedures. Launches without SOLAS certificates or unexpired certificates of inspection are subject to U.S. inspection and certification.

a. For foreign flag launches, a U.S. issued Certificate of Inspection (COI) should include appropriate limitations on the area of operation. In no case should the COI on a foreign flag launch authorize operation in areas outside of U.S. jurisdiction. As a minimum, the inspection should be sufficient to ensure that machinery and electrical installations are safe and appropriate, and that lifesaving equipment adequate for the area of operation is provided. Drydock inspections can be completed with the boat in the davits.

b. For foreign launches, including foreign-built boats on U.S. registered vessels, the U.S. Customs Service has ruled that transport of passengers between a passenger vessel (in U.S. territorial waters) and a point on shore is not a violation of 46 App. U.S.C. 289, if the following conditions are met:

(1) The transporting boats arrive in the U.S. territorial waters on board the vessel;

(2) The boats are used solely to transport the passengers between the vessel and the shore;

(3) The District Director of Customs is satisfied that it is not safe or feasible for the vessel to berth at a pier; and

(4) The boats depart U.S. territorial waters on board the vessel.

a. Foreign-built launches meeting the conditions of the Customs Service ruling would not be engaged in coastwise trade. The boats would, therefore, not have to be documented, even if carried on a U.S.-registered vessel. Depending upon state law, these boats might have to be numbered in the state of principal use, if they are not documented.

2. Passenger Vessels—Use of Lifeboats as Launches

All of the conditions for launches apply to lifeboats used as launches. In addition, the boats must meet all requirements for lifeboats. The boats may be used as passenger launches in and around the port in the vicinity of the vessel, as long as the vessel is at anchor or at the dock. (However, note that most operations in U.S. waters with the vessel at the dock would constitute coastwise trade with attendant documentation issues.) When the vessel is at anchor, there must be enough lifeboats and davit-launched liferafts remaining on board or alongside, to accommodate all persons remaining on board the vessel. The boats will be limited to launch service between the vessel and the shore at all times when there are passengers on the vessel.

a. For vessels with Coast Guard approved lifeboats, certification for the boats should not prove difficult, since the construction regulations for lifeboats have many similarities to Subchapter T requirements, such as fire-retardant resins for FRP construction, fuel and electrical system installation, and others.

b. It is possible that the number of persons permitted on board the boats in launch service will be different from the lifeboat capacity due to differing freeboard and stability requirements, and methods of determining capacity.

c. SOLAS Regulation III/19.2 (1983 SOLAS Amendments) states "Before the ship leaves port and at all times during the voyage, all lifesaving appliances shall be in working order and ready for immediate use." U.S. regulations for (large) passenger vessels require in 46 CFR 75.15-5 that the lifeboats and liferafts "be kept in good working order and available for immediate use at all times when the vessel is being navigated and, insofar as reasonable and practicable, while the vessel is not being navigated." This means that the boats will have to be stowed and configured for immediate use as lifeboats when the vessel is underway, including removal of floorboards and any other extra equipment carried for launch use which might interfere with use as a lifeboat.

d. Requirements for buoyant apparatus or life floats can normally be waived for lifeboats used as launches, since lifeboats are equipped with lifelines and inherent flotation that prevents them from sinking. Lifejackets and ring life buoys of the appropriate number are required, however, when the lifeboat is being used as a launch.

3. Cargo and Tank Vessel Launches

The situation for cargo and tank vessels is somewhat different. In some cases, these vessels are required to anchor offshore while awaiting cargo, berthing, stores, etc. The use of the ship's boats for transport of crew and stores between the vessel and the shore is acceptable. However, operation to or between different points on shore or to other vessels could constitute coastwise trade, and therefore involve issues of licensing and documentation.

X. SUBMERSIBLE VESSELS

A "submersible vessel" or "submersible" is a privately owned vessel, capable of completely submerging, that is designed for manned or unmanned independent operations underwater. Voluntary reports of submersible operations in or near U.S. waters may be made to the nearest Coast Guard Operations Center. Inquiries about the extent of such reports and other questions that cannot be resolved locally should be directed to Commandant (G-NRS) at (202) 267-1948. These reports are intended primarily for informative use in search and rescue (SAR) activities only.

1. Regulatory Oversight

a. General Requirements. Presently, the Coast Guard does not have inspection standards applicable to the design or construction of submersible vessels. As a submersible's size, means of propulsion, nature of operation, and cargo carried (if any) approximates those regulated under Title 46, Code of Federal Regulations (CFR) on surface vessels, the appropriate standards will be applied to ensure a degree of safety equivalent to that obtained on surface vessels.

b. Application of 46 CFR, Subchapter C. Generally, submersibles are subject to 46 CFR, Subchapter C (Uninspected Vessels) requirements for lifesaving and firefighting equipment, display of navigation lights and use of signals, and control of hazards associated with gasoline engines. Some items covered in Subchapter C may not be applicable for use on small submersibles. Owners or operators of such craft may request the officer in charge, marine inspection (OCMI) to accept equivalent equipment, under 46 CFR 24.15.

c. Application of 33 CFR, Subchapter S. Submersibles must also comply with certain provisions of 33 CFR, Subchapter S (Boating Safety). Undocumented submersibles (i.e., those not having federal documentation or license) with propulsion equipment, must be numbered in accordance with the federal numbering system or the numbering system of the state in which the submersible will be principally operated. When a submersible is involved in a collision, accident, or casualty, the operator is required to report such occurrences to the appropriate OCMI or state authorities, and to render all possible assistance to others involved in such incidents. 33 CFR 155 (Oil Pollution Prevention Regulations for Vessels) and 33 CFR 159 (Marine Sanitation Devices) also apply to submersibles.

2. Recreational Submersibles and Those Carrying Six or Fewer Passengers

These vessels are included within the meaning of the term "recreational vessel" in 46 U.S.C. 2101(25) and "uninspected passenger vessel" in 46 U.S.C. 2101(42). Accordingly, operators of such vessels are subject to the requirements of 46 U.S.C. Chapter 43 and 33 CFR, Subchapter S, as well as the regulations indicated above. For example:

a. All submersibles carrying six or fewer passengers for hire must be operated by a person licensed as a by the Coast Guard as an Operator of Uninspected Passenger Vessels.

b. 46 U.S.C. 4310 and 33 CFR 179 require the manufacturer of a submersible to notify the first purchaser of any defects and to correct them.

c. Under 33 CFR 181, the manufacturer must affix a hull identification number (HIN) to the submersible. This requirement applies to "backyard builders" as well as industrial firms. Upon written request from a manufacturer (or importer), Commandant (G-NAB) will assign a manufacturer identification code (MIC) which is a required part of the HIN. Persons who build or import boats for their own use and not for sale must obtain the required HIN from the State Boating Law Administrator of the state where the boat will be principally used, or from the Coast Guard district office in the area.

d. In addition, 46 U.S.C. 4302 authorizes the Coast Guard to prescribe safety standards for the design and performance of submersibles. These are published in 33 CFR, Subchapter S. Prospective manufacturers of submersibles should be encouraged to contact the Auxiliary, Boating and Consumer Affairs Division, Commandant (G-NAB), to determine which Subchapter S requirements will apply to their craft.

Y. PASSENGER CARRYING VESSELS

1. Passenger Vessels (PVs)

46 USC 2101(22) defines PV as a vessel of at least 100 gross tons, carrying more than 12 passengers, including at least one passenger for hire **OR** a vessel that is chartered and carrying more than 12 passengers. Employees of the owner of a PV who are on board and not engaged in the business of the vessel are passengers.

2. Uninspected Passenger Vessels (UPVs) and Small Passenger Vessels (SPVs)

The statutory definitions for UPVs and SPVs do not contain the "for hire" requirement. The definition of passenger is the test for whether compliance with the vessel inspection and manning regulations is required. When employees are on board an employer's PV or UPV, they are passengers by definition unless they are the master or a crewmember engaged in the business of the "vessel". An example of this might be a boat owned by a boating magazine covering an event on the water. The master and crew of the vessel would not be considered passengers for either a UPV or SPV. However, on a UPV a company advertising salesman on board to take notes on prospective clients would not be considered crew engaged in direct business of the vessel and would be a passenger. With an SPV, this same salesman is engaged in the business of the vessel owner and, by extension, is not a passenger.

If the vessel in question is operated on a legal bareboat charter and is carrying only employees who are not considered passengers under 46 USC 2101(21), then they are not engaged in coastwise trade and documentation is not required.

3. Passenger Vessel Investigations

Pending definitive legislative resolution, enforcement personnel shall continue investigations and boardings of passenger vessels as current procedures specify (except in situations where more specific guidance pertaining to particular vessels dictates otherwise). Any vessel documents and/or charter agreements reviewed during boardings, which appear to be in proper order, should be accepted at face value. This policy results in the following courses of conduct in specific situations:

a) If the condition of the documents and the circumstances of the voyage give the boarding officer no reason to doubt the validity of a purported bareboat charter party, a valid charter agreement shall be assumed to exist. For the purposes of any further safety inspection, the vessel shall be considered to be within 46 USC 41 or 43 as appropriate.

b) If a bareboat charter party appears on its face to be valid, but the circumstances nevertheless give the boarding officer some reason to doubt its validity, no further immediate inquiry into the nature of the agreement will be undertaken. In these circumstances, however, guest lists, pertinent legal documents, and the names and addresses of owners, operators, or persons-in-charge may be gathered during the boarding for later follow-up investigation ashore. Any further safety inspection during the boarding shall be conducted in accordance with the assumption that the documents are valid, i.e., the vessel shall be considered within 46 USC 41 or 43, as applicable.

c) If a purported bareboat charter party is invalid on its face, then the inspection shall proceed as if no bareboat charter party exists.

d) Naturally, the voyage of any vessel determined to be unsafe under the assumptions described above should be terminated in accordance with applicable guidelines.

Z. OIL/BULK ORE (OBO) VESSELS

1. Class Problems

OBO vessels are vessels that originally carried grain and ore cargoes and were then converted to oil carriers. The handling of grain and ore cargoes requires the use of clamshell buckets and draglines, as well as other types of shovel equipment that is literally dropped into the cargo holds. The bulk cargo is also moved around inside the holds with overhead unloaders and bulldozers. The use of this heavy machinery to handle these types of cargo causes damage to the cargo hold boundaries. When these vessels enter into the liquid cargo trade, there may be many leaks into the void spaces surrounding the converted cargo tanks. This presents an explosion and fire hazard if the void spaces are not properly cleaned or inerted.

2. Inspection Procedures

Although OBO vessels identified as having leakage problems are primarily Swedish built, all vessels of this configuration should be considered to have the potential of leakage into void spaces. The following action should be taken to minimize the potential for leakage risk:

a. During each required boarding of an OBO carrying flammable or combustible liquid cargoes, and more frequently if deemed appropriate by the OCMI, voids should be sounded for leakage and/or otherwise checked to ensure that they are clean and free of vapors. If cargo is found in a void space, then that space shall either be cleaned and gas-freed or inerted to the satisfaction of the OCMI.

b. Some vessels have inerting systems connected to void spaces, which require extra attention. These spaces should be checked for O_2 content. If the O_2 content is above allowable limits, the inerting system should be brought on line and the O_2 level reduced, unless it can be shown that there is no leakage of cargo into the void spaces.

3. Notification of Cargo Leakage

When leakage of cargo into a void space is found, the OCMI should take whatever action he or she deems appropriate to ensure that transfer operations can be conducted safely. Notification should be made to the vessel's master and owner or operator that the vessel will not be allowed to return to the U.S. until all leaks have been repaired. The vessel's classification society should also be notified of the defects. A Special Inspection Note should be entered into the vessel's MSIS file (see MSM II-A3).

AA. DRACONES

The Coast Guard has concluded that it would be unrealistic to apply inspection standards to dracones. It is the view that dracones are essentially employed as emergency response equipment, much the same as skimmers and containment boom. Although they may technically be considered vessels when deployed, their construction, operational limitations and mode of employment make application of the inspection statutes inappropriate.

It is recommended that contractors using dracones for temporary storage or transfer of product periodically examine them in accordance with manufacturer's instructions. Otherwise, there are no other applicable servicing or examination criteria.

BB. UNDOCUMENTED VESSELS

1. Authority for Numbering of Undocumented Vessels

Under 46 U.S.C. 12302, the Secretary of the Department of Transportation (SECDOT) has the authority to establish a federal standard numbering system for vessels, and to approve state numbering systems which are in accordance with this federal numbering system. The federal system is outlined in 33 CFR 173; provisions for state number systems are found in 33 CFR 174. Most states have met the basic intent of the federal standard system, and their numbering systems have been approved accordingly.

> **NOTE:** In 1985, only 2 jurisdictions lacked numbering systems that complied with the federal standard: Alaska and New Hampshire. The numbering of all boats registered in these states that operate on waters under the jurisdiction of the United States is accomplished by Marine Safety Office (MSO) Juneau, for Alaska, and the First Coast Guard District (CCGD1), for New Hampshire.

2. Comparing Federal and State Numbering

Approved state numbering systems meet the basic intent of the federal standards under 33 CFR 173 and 174, and they number all undocumented vessels equipped with propulsion machinery of any type. There are slight differences between the standard system and individual state systems. For example, Rhode Island registrations expire every 2 years, instead of the 3 years allowed by the standard system; in other states, the registration expires annually. Approximately one-quarter of the states require numbering of vessels other than those propelled by machinery only. Validation stickers, required for those vessels numbered by the Coast Guard, are optional under state numbering systems.

3. Numbering Undocumented Vessels

Federal and state systems for numbering undocumented vessels follow similar procedures. For a new number issue, the vessel owner forwards an Application for a Certificate of Number, plus a registration fee, to the appropriate numbering authority. Upon receipt of the application and fee, the numbering authority will usually issue a temporary Certificate of Number. The permanent certificate and validation decal(s), if required, will be forwarded at a later date. The validation decals are distinctively colored to indicate the year the number expires (see 33 CFR 173). Once approved, a state numbering system is in full effect and exemptions granted by the state are recognized by the Coast Guard. For example, North Carolina's approved system exempts boats powered by electric motors. Although an electrically propelled boat is required by federal regulations to be numbered, the North Carolina law is controlling, and the Coast Guard will not act against the operator of such a boat in that state.

> **NOTE:** 46 U.S.C. 12302(f) states that the SECDOT may withdraw approval if the state system is not consistent with the federal system.

4. Offenses Related to Numbering of Undocumented Vessels

In states which have an approved numbering system, enforcement of the numbering regulations will be deferred to the state authority. Enforcement of numbering regulations is done in the course of enforcement of all federal boating laws and regulations. A Report of Violation, Form CG-4100, shall be forwarded to the district commander for appropriate civil penalty action.

5. Numbering of Certificated but Undocumented Vessels

a. Subject Vessels. Due to the nature of their employment, the route upon which they operate, their size, or interagency understandings, certain classes of vessels are required to have a Certificate of Inspection (COI), but are not required to be state or federally numbered. These include, but are not limited to:

(1) Public vessels, public school ships, and civilian manned vessels of the Military Sealift Command (MSC), U.S. Navy, or the U.S. Army Corps of Engineers (USACE), which possess COI's.

(2) Barges, sailing vessels, and inland motor vessels carrying flammable or combustible cargo in bulk, or dangerous cargo, which require COI's but are not subject to federal documentation or state numbering statues.

(3) Vessels not normally inspected as a consequence of location of operation, which must obtain COI's for changes in location of operation or a change of service (e.g., a barge or dredge which changes location of employment via a route which would subject it to the requirements for seagoing barges).

b. Procedures. An internal Coast Guard numbering system has been established as a standard for record maintenance and tracking of tank and dangerous cargo barges. This system is used to track vessels through changes of ownership, operators, and names for maintenance of the Marine Safety Information System (MSIS). Upon receipt of a COI Amendment or Report of Marine Accident, Injury or Death, Form CG-2692, on a certificated but undocumented vessels, the Marine Safety Information System Branch, Commandant (G-MP-4), will assign to that vessel a number consisting of the letters "CG" followed by six numerals. Cognizant field units will be notified of the number assigned to each vessel; all COI's and reports should list that number in the "Official Number/Award Number" block of the form.

NOTE: Owners are encouraged, though not required, to mark their vessels with the Coast Guard number in a manner similar to marking of Official Numbers.

CC. INSPECTION AND CERTIFICATION OF MOORED PASSENGER/ATTRACTION VESSELS

1. Purpose

The purpose of this policy is to set forth procedures for the inspection and certification of temporarily moored attraction vessels as passenger vessels.

2. Discussion

a. Attraction vessels are vessels that are put on public display or used as a platform for a public exhibit and carry "passengers" only while temporarily moored to dock. By charging visitors some form of admission to board, or accepting donations or some other valuable consideration, attraction vessels are subject to U.S. inspection laws as passenger vessels or small passenger vessels. These vessels may operate on an established itinerary, calling on several ports for brief periods of time. Attraction vessels may be of unique or unusual design, have some historical significance, be restored or constructed as replicas of former vessels or provide some related maritime interest to the public. Generally, the design or construction of an attraction vessel precludes conformance with or retrofitting to meet U.S. passenger vessel requirements without damaging the originality of the vessel.

b. The term "passenger" as used in this policy is the same as defined in 46 USC 2101(21)(A).

3. General Policy

a. In recognition of the reduced safety risks associated with a vessel that is moored to a fixed structure, an attraction vessel may be issued a Certificate of Inspection (COI) to permit operation as a passenger vessel if the OCMI is satisfied that the vessel can operate safely while moored. A COI may be issued under this policy with a period of validity up to one year and will contain specific operating restrictions, including those addressing local conditions. An attraction vessel with a valid COI issued under this policy that relocates in another OCMI zone will undergo subsequent reinspection by the cognizant OCMI to determine the need to specify operating restrictions based upon local port conditions.

b. Regardless of the period of validity of the COI, an attraction vessel will be considered to be operating under the terms of its COI only while it is moored at the location(s) and during the period authorized, as specifically endorsed on the COI by the OCMI.

4. Applicability

These guidelines apply to a vessel meeting the following criteria:

a. A U.S.-flag vessel that is either uninspected or, if inspected, lacks authorization on its COI for the carriage of passengers. Or, a foreign-flag vessel that does not possess a valid SOLAS Passenger Ship Safety Certificate.

b. The vessel is visiting a port or place for a limited period of time.

c. The vessel is not permanently moored.

d. A charge for admission or some form of compensation or consideration from visitors is required, expected, or accepted in conjunction with boarding.

e. Passengers are not carried while the vessel is underway or while the vessel is at anchor.

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5. Duration of Operation in a Zone

This policy is not intended to permit a vessel to circumvent vessel inspection laws by operating as a passenger vessel while moored for an indefinite period of time in the same general area. A period of approximately one month at the same location or port area is considered reasonable, but in unusual circumstances, OCMIs may permit a brief extension of the initial period. An OCMI shall, when issuing or amending a COI issued pursuant to this policy, specify in the operating details of the COI the dates when and place(s) where in the OCMI's zone the vessel is permitted to operate.

Jones Act Status

a. Jones Act Status. U.S. Customs, in practice, has not considered a foreign-built vessel moving along the coast and charging a fee for exhibition as coastwise trade, provided promotional literature, or articles for sale or exhibit are not loaded and unloaded between coastwise points. If there is doubt as to the applicability of the Jones Act to a particular attraction vessel, prior to issuing a COI, an OCMI may require the vessel operator to obtain a ruling from the U.S. Customs Service, Office of Regs and Rulings, Entry Procedures and Carrier Branch, 1300 Pennsylvania Avenue, Washington, D.C. 20229, Tel (202) 927-2320.

Application for Inspection

b. Application for Inspection. To apply for inspection as an attraction vessel, the owner or operator of an uninspected or foreign vessel will submit an application for inspection to the cognizant OCMI. Accompanying the application for inspection, the owner or operator must submit additional vessel information per paragraph 7.a. and a port operating plan containing port specific information per paragraph 7.b. If the vessel will be operating on an itinerary and calling in other OCMI zones, the owner or operator should arrange for reinspection in subsequent ports, but need only submit a port operating plan in advance. A U.S. inspected vessel not in passenger service will be required to submit an application for inspection and information to the OCMI as specified in paragraph 12.

Additional Vessel Information and Plans Required

c. Additional Vessel Information and Plans Required. Accompanying the application for inspection, the owner or operator shall provide the following information to the OCMI:

(1) A copy of the vessel's fire control plan and/or structural fire protection plan, if such plans are available.

(2) If a fire control plan in accordance with SOLAS 74 (as amended), Chapter II-2, Reg. 20 is unavailable, a basic plan should be provided, indicating the locations and types of all emergency response or safety-related equipment available on the vessel, including fire fighting, damage control, and lifesaving equipment.

(3) Proposed maximum number of passengers to be permitted aboard the vessel, including the calculations used for determining the maximum number of passengers.

(4) Results of the most recent hull examination, if any, including an assessment/testament as to the condition of the hull.

(5) Copies of any applicable certificates issued by other OCMIs, the vessel's home Administration, or a recognized classification society (e.g., Load Line, SOLAS, etc.).

(6) The minimum number of crewmembers to be aboard the vessel during hours of operation and an explanation of their job descriptions and qualifications.

(7) Amounts, types and stowage of any flammable or combustible liquids including fuel aboard the vessel.

(8) The proposed (general) itinerary of the vessel while in U.S. waters, including ports, dates of arrival and departure.

Submission of Port Operating Plans

d. Submission of Port Operating Plans. A Port Operating Plan shall be submitted to the OCMI conducting the inspection for certification and to the OCMI for each subsequent zone where the vessel will be operating. The Port Operating Plan will provide detailed information concerning a vessel's intended operations while in each respective OCMI zone. Each Port Operating Plan should include the following information:

(1) Approximate dates when the vessel will operate in the OCMI's zone.

(2) Location(s) in the OCMI's zone where the vessel will operate.

(3) Proposed hours of operation during which passengers would be permitted on board.

(4) Proposed method for mooring the vessel.

(5) Means of access/egress for passengers.

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8. Inspection for Certification

The inspection for certification of an attraction vessel should be oriented towards identifying potential hazards to passengers on board that vessel while moored to a pier. In this respect, the requirements and scope of the inspection are significantly less than that for inspection of a vessel carrying passengers underway. The following provides general and specific requirements, particular areas of concern, and suggested equivalent standards of safety for moored attraction vessels.

Pollution Regulations

a. Pollution Regulations. Attraction vessels shall comply with the requirements for pollution prevention and marine sanitation devices as found in 33 CFR 151, 155, 156 and 159.

Decks, Rails, and Stairs

b. Decks, Rails, and Stairs. Deck areas, stairs and ladders will be free from tripping, slipping and falling hazards to passengers. The OCMI may apply the standards for heights of deck rails from the regulations for small passenger vessels in 46 CFR, Subchapter T.

Gangways (or Brows)

c. Gangways (or Brows). Gangways should be suitably sized and located to accommodate passenger/crew escape in the event of an emergency. Depending upon vessel arrangement and size, and width of the gangway, the OCMI may require the installation of two or more gangways. Inspectors should closely scrutinize any gangway that is attached to the side of a vessel, in lieu of being supported by a gunwale or other deck support. Unless properly designed to accommodate the service load and the dynamic forces resulting from tidal changes and vessel surge, the mounting brackets used to attach the gangway to the side of the vessel are subject to potential failure, presenting a serious safety risk to persons using the brow. When side-mounting brackets are used, a redundant means for securing the gangway shall be provided. This may be accomplished by use of ropes, chains or cables attached to a secure structure or fitting on deck, which could support the brow in the event of failure of the side brackets. Regardless of design and securing arrangements, OCMIs should consider requiring the installation of safety nets below all gangways, where practicable.

Lighting

d. Lighting. Interior lighting in areas accessible to passengers should be adequate to the extent that portable lighting equipment should not be necessary. If emergency lights are not installed, guides or crewmembers on watch during hours of operation may be required to carry suitable portable lighting. If the vessel operates at night, there shall be exterior lighting of sufficient intensity for illuminating the weather decks and gangway(s).

Electrical Fixtures and Wiring

e. Electrical Fixtures and Wiring. Electrical installations and equipment shall be reasonably safe from fire or electrical shock. For U.S.-flag vessels, inspectors should refer to the electrical standards included in 46 CFR, Subchapter J, K, or T (as appropriate) as a general guide. For foreign-flag vessels, the standards found in SOLAS 74/78 (as amended), Chapter II-1, Regulation 45 should be used.

Means of Escape from Below-Deck Spaces

f. Means of Escape from Below-Deck Spaces. If below deck areas will be accessible to passengers, at least two means of escape should be available, or as an equivalent, the number of passengers permitted below decks or in a space below decks at any given time should be restricted. The OCMI may also require that passengers be escorted by a crewmember in areas below deck. If below-deck areas have no emergency back-up lighting system, crewmembers assigned to escorting passengers must carry flashlights.

Engine room and Bilges

g. Engine room and Bilges. Machinery spaces shall be examined for potential fire hazards. If passengers will be permitted in machinery spaces, the vessel operator shall identify to the inspector any equipment that may be in operation with passengers on board. An examination shall be made to detect slipping and overhead hazards, adequacy of guards for rotating machinery, appropriate insulation of hot pipes or equipment, protection of open switchboards, etc. All pressure vessels shall be identified to the inspector. If, as a result of the examination, areas are considered dangerous to passengers, they shall be declared off limits and required secured during hours of passenger operation. Spaces should also be inspected for evidence of excessive water or oil in the bilges. If such condition exists, it shall be corrected to the satisfaction of the OCMI prior to allowing passengers aboard the vessel.

Fire Fighting Equipment

h. Fire Fighting Equipment. The OCMI shall be satisfied with the amount and type of fire fighting equipment aboard the vessel. The following guidelines will apply to fire equipment requirements:

(1) Fixed fire fighting equipment, if any, and portable extinguishers shall be tested or serviced annually to the satisfaction of the OCMI. OCMIs may accept certificates issued by a professional service provider as evidence of proper servicing.

(2) In determining the number of portable extinguishers required, the OCMI may apply the standards of 46 CFR, Subchapter T, K, or H as appropriate. Portable extinguishers need not be Coast Guard approved but must be of a marine type. The use of water fire bottles is prohibited. Only carbon dioxide, foam or chemical extinguishers suitable for marine application are permitted.

(3) Fire detection and alarm systems, if installed, shall be tested to the satisfaction of the OCMI. Passengers shall not have access to any space protected by fixed gas (CO2 or Halon) fire extinguishing system unless the space has a time delay and audible warning device that activates prior to releasing the extinguishing agent. Further, the OCMI shall be satisfied that the space has adequate means of escape for the maximum number of passengers permitted in that space at any given time.

NOTE: The OCMI may require that fire drill be conducted as part of the inspection for certification.

Lifesaving Equipment

i. Lifesaving Equipment. A minimum of two ring buoys with lines shall be provided on board the vessel. Additional ring buoys, with lines as specified by the OCMI, may be required. If the vessel operates at night, ring buoys shall be outfitted with lights.

Means for Retrieval of Persons from the Water

j. Means for Retrieval of Persons from the Water. The vessel shall have suitable means or a procedure acceptable to the OCMI for the retrieval of persons from the water. The OCMI may require that a man-overboard drill be conducted as part of the inspection for certification.

Hull Condition

k. Hull Condition. The OCMI shall be satisfied with the condition of the vessel's hull. Where evidence of a satisfactory hull examination or internal structural examination within the past five years is unavailable, the vessel may be required to undergo an appropriate hull examination. In such case, the OCMI may require a drydock examination, underwater survey or internal structural examination, as necessary to gain an adequate condition assessment of the vessel hull.

Mooring Facilities

l. Mooring Facilities. The vessel's mooring location, equipment and arrangements must be acceptable to the OCMI. An OCMI should consider the location of the vessel in terms of vessel traffic, nearby waterfront facility operations, and accessibility by emergency responders. The general condition of the pier or other structure that the vessel is moored to should be evaluated for the safe transit of passengers and access by emergency vehicles. The risk matrix for permanently moored vessels, as found in MSM II-B4.I.1, may by used as a guide for OCMIs when evaluating mooring arrangements.

Public Address System

m. Public Address System. Vessels permitting passengers below decks shall have a public address system or equivalent means, acceptable to the OCMI, to alert the crew and passengers to emergencies and possible evacuation.

9. Operating Conditions and Restrictions

The following operating restrictions *may* be imposed, based on the design and construction of the vessel as well as local conditions. In preparing or amending a COI, the OCMI shall use the Vessel File Operating Details (VFOD) in MSIS to specify restrictions.

Fires and Smoking

a. Fires and Smoking. Generally, smoking or cooking using an open flame should not be permitted during hours of passenger operation on vessels that do not meet structural fire protection standards for passenger vessels. This restriction may be relaxed for vessels possessing a Coast Guard COI for service other than a passenger vessel, or for foreign vessels having a valid SOLAS Cargo Ship Safety Certificate or a Special Purpose Ship Safety Certificate issued in accordance with IMO Resolution A.534(13).

Means of Access to the Vessel

b. Means of Access to the Vessel. The vessel shall be required to maintain a clear area around the gangway(s) to facilitate evacuation of passengers and access for emergency personnel and equipment.

Passengers Permitted

c. Passengers Permitted. The number of passengers on board shall be limited as determined by the OCMI. The OCMI may apply standards from 46 CFR, Subchapter T regarding deck area, rail space or fixed seating, or use stability information on the vessel, if available. The number of passengers permitted may be restricted based upon the number of crewmembers aboard the vessel available to respond to an emergency, adequacy of escape route(s) or width/number of gangway(s). Passengers shall not be permitted to remain overnight or go aloft in rigging.

Emergency Plans

d. Emergency Plans. OCMIs shall require the vessel owner or operator to develop emergency action plans to address evacuation of passengers in the event of an emergency on board and procedures for responding to passenger injury. This may include a requirement to submit a copy of a general arrangement plan of the vessel to assist the local fire department or other emergency responders. The OCMI should, as a matter of routine, notify the local fire department regarding an attraction vessel operation and encourage a familiarization visit to the vessel.

Communications

e. Communications. As a minimum, the vessel should have some form of radio or telephone communications available for emergencies, either on board or reasonably available on the pier. Public pay phones are not considered an acceptable alternative. Also, a listing of local phone numbers for Coast Guard, fire department, policy and other emergency services should be readily available.

10. Crew Assignments

Evaluation of Manning Adequacy

a. As part of an inspection for certification, the OCMI shall evaluate the crew assignments submitted by the vessel operator to determine if the number of personnel on duty is adequate for crowd control, emergency response and, if required, escorting passengers. The number of crewmembers required on board and on duty while conducting passenger operations should be based upon the following minimums:

(1) A person in charge, having authority over the vessel operation and crew, shall be assigned.

(2) A person shall be stationed in the immediate proximity of each gangway to monitor the arrival and departure of passengers.

(3) Additional personnel as necessary for escorting passengers below decks or maintaining a roving safety/fire watch.

Reduced Manning

b. Reduced Manning. The OCMI may authorize a reduced number of crewmembers on duty depending upon the number of passengers on board and the configuration of the vessel. This reduction may be contingent upon the vessel operator demonstrating that there are means to adequately monitor the number of passengers on board at any given time.

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11. U.S. Inspected Vessels Operating As Attraction Vessels

A U.S. vessel that possesses a valid COI as other than a passenger vessel or small passenger vessel and desires to operate as an attraction vessel shall be inspected to the extent necessary to determine that the vessel can safely accommodate the number of passengers requested. Upon requesting inspection, the vessel operator shall indicate the number of passengers requested, number of crewmembers aboard and job description, and provide a Port Operating Plan as specified in paragraph 7.b. The vessel's existing COI shall be amended to address special operating conditions that may be imposed while the vessel is operating as an attraction vessel.

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12. Operation in Other OCMI Zones

Vessels that will operate in more than one OCMI zone are subject to a "reinspection" prior to commencing operation in a new zone to satisfy the OCMI that the vessel is safe for the intended operation. In general, OCMIs should employ the conditions of a previous OCMI, but may impose additional operating restrictions more suitable to local conditions. In so far as possible, OCMIs should be consistent in their application of conditions and restrictions. The first OCMI who has contact with a vessel that will operate in other zones should obtain the vessel's itinerary (see 7.a.(8)) and notify the other OCMIs of the vessel's intentions.

MSIS

a. MSIS. OCMIs shall employ MSIS to enter vessel particulars, record inspection activities and deficiencies, and issue COIs. Detail products in the vessel file (e.g., portable fire fighting and lifesaving equipment) shall be entered to the extent necessary to reflect equipment requirements on the COI. Also, an inspection note should be entered in MSIS indicating the vessel's last hull examination date, regardless of whether the examination was attended by Coast Guard inspectors.

Vessel Inspection User Fees

b. Vessel Inspection User Fees. Because moored attraction vessels are issued Certificates of Inspection, they are subject to paying vessel inspection user fees, unless otherwise exempted. The qualifications for exemption are included in 46 CFR 2.10-5

> **NOTE:** These regulations were amended 21 April 1997 and are reflected in the 1998 version of the CFR.

Referencing the list of fees included in 46 CFR 2.10 (Table 2.10-101), attraction vessels measuring less than 100 gross tons will be assessed fees as "small passenger vessels"; attraction vessels of 100 gross tons or more will be assessed fees as "other" vessels.

CHAPTER 5: INSPECTION OF PUBLIC VESSELS

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CHAPTER 5: INSPECTION OF PUBLIC VESSELS

A. INTRODUCTION

Public vessels of the United States, other than those owned or operated by the Maritime Administration (MARAD), are not generally required by law to be inspected and certificated. However, several government agencies have requested the Coast Guard to assist them by conducting safety inspections on their vessels. In some cases, what is requested is a full inspection resulting in issuance of a Certificate of Inspection (COI). In other cases, inspections of limited scope or of specific items are requested. The Commandant intends to cooperate with these agencies by carrying out requested inspections in accordance with inspection agreements, as resources permit. Public vessels subject to inspection under federal statutes and regulations shall be inspected under the appropriate regulations in Title 46, Code of Federal Regulations (CFR).

B. REFERENCES

1. Statutes

The statutes relating to inspection of public vessels are primarily contained in 46 U.S.C. 2101(24) and 2109.

a. 46 U.S.C. 2101(24). This section defines a public vessel as one that "is owned, or demise chartered, and operated by the United States Government or a government of a foreign country; and . . . is not engaged in commercial service."

b. 46 U.S.C. 2109. This section states that Subtitle II of Title 46 does not apply to a "public vessel of the United States," but that Subtitle II does apply to vessels owned or operated by the Department of Transportation (DOT), with the exception of Coast Guard and St. Lawrence Seaway Development Corporation vessels.

2. Regulations

The regulations explaining the application of inspection requirements to public vessels include the following:

	TYPE	CFR CITE
a.	Tank Vessels	46 CFR 30.01-5(d)(3)
b.	Passenger Vessels	46 CFR 70.05-1(a)(3);
c.	Cargo and Miscellaneous Vessels	46 CFR 90.05-1(a)(4);
d.	Public Nautical School Ships	46 CFR 167
e.	Small Passenger Vessels	46 CFR 175.05-1(a)(3)
f.	Oceanographic Research Vessels	46 CFR 188.05-1(a)(4)

C. GENERAL INSPECTION PROCEDURES

1. Administrative Procedures

An Application for Inspection, Form CG-3752, shall be addressed to the officer in charge, marine inspection (OCMI) in whose zone the vessel is located. Upon satisfactory completion of the inspection, the OCMI shall issue the vessel a COI. The government agency involved may, upon request, obtain a copy of the certificate. Unless a public vessel is able to comply with all applicable requirements (except as modified by agreements or additional instructions), no COI shall be issued. Instead, a letter will be addressed to the agency operating the vessel, indicating the extent of the inspection and all deficiencies noted.

2. Acceptance of Alternate Equipment or Arrangement

For certain vessels, agreements have been made to accept certain equipment or other standard specifications as equivalent to those specified in the regulations (these equivalents are described below). Inspectors shall exercise the same degree of care and diligence in inspecting government vessels as they would for commercial vessels.

3. Reporting Procedures

Inspection reports shall be made in the same manner as for commercial vessels insofar as practicable, in the appropriate CG-840 inspection booklet. Specialized local report forms may be used to cover limited inspections. Reports of all inspections shall be filed by the OCMI (See MSMII, Section A, Chapter 3).

D. MISCELLANEOUS DECISIONS AND INTERPRETATIONS

1. Public Vessels

The term "public vessel," as defined in 46 U.S.C. 2101(24) to obtain exemption from inspection requirements, refers to those vessels that are:

a. Not engaged in commercial service; and

b. Owned, or demise chartered, and operated by the United States Government or the government of a foreign country.

NOTE: The definition of "public vessel" generally excludes use in trade or commerce. Military vessels which engage in a commercial activity lose their public vessel exemption status for the duration of the commercial operation. They must apply to the OCMI for inspection and certification for the route and service in which they wish to engage.

2. State-Owned Vessels as "Passenger Vessels"

The Passenger Vessel Safety Act (PVSA) of 1993 established clear definitions of the terms "passenger," "passenger for hire," "passenger vessel," "small passenger vessel," and "uninspected passenger vessel." These new definitions should alleviate the former difficulties in determining whether or not state owned vessels are subject to inspection.

3. Carriage of Vehicles Containing Hazardous Materials

There is no regulatory basis for the inspection of vessels based solely on their carriage of transport vehicles containing hazardous materials. (See MSM II, Chapters 11.D and 11.I for a discussion of “bulk” or “packaged” and for operating requirements when carrying portable and/or fixed tanks.)

a. With regard to the transportation of hazardous materials in the transport vehicles, the Coast Guard may still enforce the provisions of 49 CFR 176 specifically 49 CFR 176.11(d), for transportation of those materials by vessel. Additionally, free ferries (state-owned and operated vessels which do not charge) meet the definition of uninspected vessels in 46 USC 2101(43) and are therefore subject to the provisions of 46 USC Chap. 41 as well as 46 CFR Subchapter C.

NOTE: Free ferries are not uninspected passenger vessels because they do not carry passengers for hire, but they do meet the definition of uninspected vessel.

b. In addition to the safety oversight, there is also authority under the Ports and Waterways Safety Act, 33 USC 1223, to impose conditions of operation on free ferries if there is a determination that such action is justified in the interest of safety. This means that that should the Captain of the Port (COTP) determine that the carriage of hazardous materials aboard these vessels is unsafe for passengers, the COTP could impose specific conditions of operation on these vessels. Before doing so, the COTP is required to take into account the considerations established in 33 USC 1224. Issues which may be considered as conditions of operation are not limited to the vessel's structural condition, equipment or route, but, if deemed appropriate could include items such as restricting passenger carriage and/or imposing crew qualifications while the vessel is carrying hazardous materials.

E. VESSELS OF THE MILITARY SEALIFT COMMAND (MSC)

1. Inspection Agreement

The Commander, MSC (an arm of the U.S. Navy (USN)) has requested that the Coast Guard inspect and certificate MSC vessels, which are operated by civilian merchant mariners. Such a vessel is normally designated "MSC, in service, civilian-manned" on the COI; the term "in service" contrasts with "commissioned" naval ships, which are manned by military personnel. MSC intends that no civilian-manned vessel will be operated without a COI, unless military requirements make it necessary. However, the Coast Guard will not normally be asked to inspect and certificate the following vessels:

a. Those vessels controlled by the Commander, MSC Far East Area;

b. Landing craft-type vessels, such as Landing Ships, Tank (LST's) and Landing Crafts, Medium (LCM's); and

c. Vessels that are essentially military in character, by virtue of assignments or construction standards.

The Coast Guard will inspect MSC vessels for which inspection requests are filed to verify that they comply with the appropriate requirements. OCMI's shall certificate MSC vessels that comply with the regulations (as modified by further agreements or instructions). COI's shall not be issued to MSC vessels that do not meet the requirements.

2. Applicability of SOLAS 74/78

Vessels certificated as "MSC, in service, civilian-manned" are Department of Defense (DOD) vessels used for public purposes. They are not subject to the requirements of the 1974 SOLAS Convention and its 1978 Protocol, and shall not receive SOLAS certificates, even if the vessel meets SOLAS in full and a certificate is requested by MSC. A letter stating the vessel's compliance may be issued.

NOTE: This provision does not apply to those commercial vessels on time charter to MSC from MARAD.

3. COI Modifications

Route Permitted and Conditions of Operation

a. An asterisk shall be inserted at the word "thereunder" in the eighth line of COI Form CG-841. In the space for "Route Permitted and Conditions of Operation" there shall be inserted an asterisk and the notation "In accordance with the standards applicable to MSC vessels."

Class

b. In the space provided for the vessel's class, insert the designations "Naval transport/cargo vessel/tankship (as appropriate), in service, civilian-manned."

Manning

c. In the case of P2, C3, and C4-type vessels, the presence aboard of three additional Able Seamen, not required to stand watches, shall be included for persons authorized to be carried in the crew.

Persons in Addition to the Crew

d. When deemed necessary for defense purposes by the Commander, MSC, inspected MSC vessels may carry civilian or military personnel in addition to the crew expressly to carry out vessel missions. Such personnel shall not be involved in the navigation of the vessel, and are not considered members of the crew or passengers. Their presence shall be indicated in a separate endorsement of the COI and reflected in the total of persons allowed aboard.

4. Regulatory and Equipment Modifications

General

a. In addition to material normally accepted by the Coast Guard, the OCMI may accept materials and equipment on MSC vessels that meet the requirements of any of the following authorities:

(1) The technical bureaus of the Department of the Navy;

(2) Military specifications (MILSPEC's), including Joint Army Navy (JAN) specifications;

(3) Federal specifications used for military purchases; or

(4) National Military Establishment (NME) specifications.

Vessels of Special Design

b. The Commandant may, in cases of specially designed MSC vessels, permit variations from statutory and regulatory requirements that are necessary for the special purposes for which the vessels are intended. Initial inspection files shall include correspondence and other information on the variations allowed; these should be consulted at subsequent inspections for certification.

Structural Steel Renewals

c. These must incorporate at least the minimum requirements of the Coast Guard and the American Bureau of Shipping (ABS).

Lifesaving Equipment

d. Requirements for lifesaving equipment on inspected vessels are shown in Figure B5-1. Percentage requirements are based on the total number of persons on board.

Pyrotechnics

e. USN pyrotechnics may be carried in lieu of Coast Guard approved pyrotechnics.

Lifefloats

f. USN lifefloats that are identified by nameplates as complying with the provisions of MILSPEC MIL-F16143 are acceptable, provided they are in good condition.

Canned Drinking Water

g. Emergency drinking water canned under MILSPEC MIL-W-15117 may be accepted in lieu of Coast Guard approved drinking water. Such cans are undated and may remain in service for an indefinite period. Rejection shall be based on deterioration of cans or other defects that the inspector judges to make the water unusable. Coast Guard approved water cans will be rejected after 5 years.

FIGURE B5-1: LIFESAVING EQUIPMENT FOR OCEANGOING MSC VESSELS

(To be included in future revision)

5. Inspection Waivers

Waivers from inspection requirements shall be made in accordance with the provisions of 46 CFR 6.06.

6. Cargo Tank Examinations for Marine Prepositioning Ships (MPS)

It is understood that Marine Prepositioning Ships carry large quantities of bulk liquid cargo. Therefore, it may be impracticable to conduct cargo tank internal inspections except when the vessels are in drydock and the cargo tanks are gas free. Inspections of any tanks which are gas freed, safe for entry, and accessible, together with internal structural examinations, may be conducted to satisfy the requirement for alternate cargo tank internal examinations. These inspections will be conducted to the satisfaction of the OCMI.

F. VESSELS OF THE U.S. ARMY CORPS OF ENGINEERS (USACE)

1. Inspection Agreement

Upon application for inspection, the Coast Guard will inspect and certificate USACE vessels that comply with applicable statutory and regulatory requirements. When a USACE vessel does not comply with requirements, a written statement of the conditions found will be forwarded to USACE, with the returned application.

2. Regulatory and Equipment Modification

Lifesaving Equipment

a. At the request of the Chief of Army Engineers, the Commandant has accepted unicellular plastic lifesaving ring buoys, MILSPEC MIL-R-0016847, for use on USACE vessels. Agreement has been reached with USACE on upgrading of the safety standards for lifesaving equipment. The USACE has agreed to replace unicellular plastic foam work vests (MIL-L-17653) with Coast Guard approved personal flotation devices (PFD's). The old work vests will be replaced on all USACE vessels except those engaged on river routes, in quantities specified by Coast Guard regulations. However, they may be retained for use by crewmembers working near or over the water, as per the regulations.

Manning

b. Vessel manning issues are discussed in MSM III.

G. DOD/NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) INSTRUMENTATION SHIPS

1. Introduction

Special-purpose ships that are owned by the U.S. and operated as public vessels to provide instrumentation facilities for DOD and NASA missile and space programs are classed as "instrumentation ships." These are under the control of the Commander, MSC.

2. Inspection and Certification

Upon application, these vessels will be inspected and certificated by the Coast Guard. 46 CFR, Subchapter I (Cargo and Miscellaneous Vessels) applies to instrumentation ships, insofar as practical. The entry for "Total persons allowed" on the COI shall be the maximum number permitted by the Coast Guard (normally, the capacity of the primary lifesaving equipment aboard will be the determining factor). Such vessels manned by military rather than civilian personnel will be awarded Letters of Inspection in lieu of COI's. Civilian crewmembers must be licensed or certificated as a condition of employment on such vessels. When the number of persons aboard exceeds normal manning standards, or the vessel varies significantly from the standard "cargo ship" configuration, additional requirements for improved access and fire protection may be imposed.

3. Special Instrumentation Equipment

In regard to such systems, the Coast Guard exercises plan approval and inspection of electrical distribution systems only to the point of the vessel's electrical power takeoff. The Coast Guard's concerns are fire, personal hazard, and interference to the vessel's service power or main propulsion plant that may be caused by instrumentation systems, not the proper functioning of such systems themselves.

4. Manning Standards

The OCMI specifies the minimum manning requirements for instrumentation ships on the COI; however, the categories of persons on board is not limited. For "normal" operation under the COI, the Commandant requires manning by properly licensed and certificated personnel in the deck, engineering, staff, and steward departments. All persons not employed in those categories are considered other persons "employed or engaged in the business of the vessel" (see 46 CFR 90.10-29) and are not required to hold Merchant Mariner's Documents (MMDs).

NOTE: For more information, see volume III of this manual.

5. Accommodations

The requirements of 46 CFR 92.20 do not apply to "other persons employed or engaged in the business of the vessel."

6. Operation Under Special Conditions

Under certain unforeseen conditions and mission requirements, it may be necessary for instrumentation ships to sail under conditions not permitted by the COI. When such conditions prevail, the Commander, MSC will authorize the vessel to sail without compliance and notify Commandant (G-MOC) of such authorization.

7. Casualty Review

The masters/commanding officers (COs) of civilian or military manned instrumentation ships are not required to report marine casualties to the Coast Guard, and the Coast Guard will not investigate such casualties unless specifically requested to by DOD. However, contract-operated instrumentation ships and their masters are required to report marine casualties to the Coast Guard, which will investigate them unless specifically requested not to by DOD.

NOTE: For more information, see volume V of this manual.

8. Disciplinary Actions Against Crewmembers

Necessary disciplinary actions shall be taken in accordance with existing agreements, modified as necessary, between the Coast Guard and MSC. (See MSM V for more information on this subject.)

9. Lifesaving Equipment

Lifeboats

a. Lifeboats. Generally, these must be approved under 46 CFR 160.035 for a 200-percent requirement. If the vessel meets requirements for one-compartment subdivision and stability in accordance with 46 CFR 73-74, only 100-percent lifeboatage is required.

PFDs

b. PFDs. These must be approved under 46 CFR 160.002, 160.005, or 160.055, or USN MIL-L-10845, for a 100-percent requirement.

Inflatable Life Rafts

c. Inflatable Life Rafts. These must be approved under 46 CFR 160.051. 46 CFR 94.10-55 provides for certain substitutions of inflatable life rafts for lifeboats.

10. Pyrotechnics USN pyrotechnics are acceptable.

11. Repairs and Alterations Plan approval for new construction, conversion, and alterations will be carried out in accordance with applicable Coast Guard regulations. Notice of repairs or alterations shall be submitted to the Coast Guard in accordance with 46 CFR 91.45-1. Inspections of such alterations or repairs shall be accomplished in accordance with 46 CFR 91.45-5.

H. NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION (NOAA) VESSELS

NOAA vessels that meet single-compartment subdivision and stability requirements of 46 CFR 73-74 require only 100-percent lifeboatage.

I. VESSELS CHARTERED BY THE NATIONAL MARINE FISHERIES SERVICE (NMFS)

1. Introduction

An inspection agreement between the Coast Guard and the NMFS concerns commercial fishing vessels chartered to the agency for regulatory or research purposes. When a commercial fishing vessel is selected by NMFS for a charter, the Coast Guard District Fishing Vessel Safety Coordinator or local MSO examiner will be so advised of the vessel's name, official number and location in order to schedule an agreeable time to conduct a dockside examination.

2. Inspection Standards

NMFS chartered vessels shall comply with all applicable laws and regulations for fishing vessels. The Fishing Vessel Examiner will conduct a dockside examination of the vessel. The examination record shall indicate whether or not the vessel is in compliance with applicable regulations. The Examiner shall leave the original inspection booklet aboard the vessel, retain a copy locally, and forward copies to the NMFS and the District Fishing Vessel Safety Coordinator.

3. Standards of Seaworthiness

NMFS will make a careful selection of the vessels it desires to charter to ensure that they are basically seaworthy. The Coast Guard inspection is not primarily an inspection for seaworthiness. However, unsafe structural conditions that are observed shall be reported to Commandant (G-MOC), and a Letter of Inspection shall not be issued. In such a case, NMFS generally will cancel the charter and hire another vessel.

4. Letters of Inspection

Vessels that comply with the applicable requirements shall be issued Letters of Inspection by the OCMI. A sample letter is located in Figure 12-2. The original Letter of Inspection shall be posted aboard the vessel, with a copy retained by the OCMI and two copies forwarded to Commandant (G-MOC).

FIGURE B5-2: SAMPLE LETTER OF INSPECTION FOR CHARTERED COMMERCIAL FISHING VESSELS

This letter expires on (expiration date of charter).

The (VESSEL NAME), (O.N.), was inspected by the Coast Guard on (DATE), at (PLACE) and was found to be in compliance with the applicable inspection criteria approved jointly by the National Marine Fisheries Service and the U.S. Coast Guard.

This vessel is considered satisfactory for operation during the period of charter on (ROUTE).

It is understood that a maximum of crew and persons in addition to the crew will be carried. Total persons allowed is (#).

Primary Lifesaving Portable Fixed

Equipment Data

Fire Extinguisher Data

Officer in Charge, Marine Inspection
Inspection Zone

J. VESSELS CHARTERED BY THE INTERNATIONAL HALIBUT COMMISSION

These vessels shall be inspected and certificated in the same manner as NMFS chartered vessels.

K. INSPECTION OF BOILERS OR PRESSURE VESSELS ON FLOATING EQUIPMENT

1. Application for Inspection

Application for inspection of boilers or pressure vessels only, on federally owned floating equipment, shall be made to the OCMI in whose zone the equipment is located.

2. Inspection Reports

All reports concerning such inspections shall normally be made on the form(s) supplied by the agency having custody of the equipment being inspected and filed by the OCMI. Copies of the report shall be forwarded to the representative of the agency involved.

L. MARITIME ADMINISTRATION READY RESERVE FORCE (RRF) VESSELS

1. Introduction

As previously noted in the introduction to this chapter, public vessels, except those owned or operated by the Maritime Administration (MARAD) are not generally subject to inspection. Coast Guard policy concerning inspection of MARAD RRF vessels is outlined in a Memorandum of Understanding between the Coast Guard and the Maritime Administration contained in volume X of the Marine Safety Manual. The MOU recognizes the special nature of these vessels and the need for a special inspection policy.

2. Background

MARAD vessels which are being maintained in continuous operation generally conform to the same regulations and inspection intervals applicable to their commercial counterparts. However, most RRF vessels spend the majority of their life in a deactivated, non-operational status. Because of this unique set of circumstances, the USCG/MARAD MOU allows inspection intervals to be modified and the correction of outstanding deficiencies delayed when RRF vessels are in a deactivated status. The current MOU was a direct outgrowth of lessons learned by both OCMIs and MARAD personnel during RRF vessel inspections conducted for activation in support of operation DESERT SHIELD/DESERT STORM (August 1990 to July 1991). The MOU is intended to permanently capture the knowledge and experience gained during this first large scale activation of the RRF since its creation in 1976.

3. Summary of Significant Additions to the USCG / MARAD MOU.

Annex III, Command, Control and Communication

a. A third annex was added to the MOU which outlines procedures for coordination and communication between USCG/MARAD and contract vessel operators at various levels within each organization. Emphasis is on early and frequent communication for resolution of inspection issues.

Time Limit for Completion of Deficiencies

b. A limit of one year after completion of the inspection for certification was placed on correction of material deficiencies for RRF vessels in phase IV, maintenance. Under the previous MOUs, material deficiencies could be deferred indefinitely during phase IV, until the vessel was activated for operations. Attempting to correct all these deficiencies upon activation resulted in substantial delays to commencement of operations. This time limit is intended to minimize the number of deficiencies which will require correction should an RRF vessel be required to activate on short notice. By allowing a year from the date the COI inspection is completed to correct deficiencies, MARAD has retained the flexibility to schedule necessary shipyard periods and operational tests of the vessels' systems during the phase IV.

RRF Vessels in Phase IV that Exceed the Time Limit for Correction of Deficiencies

c. The MOU allows OCMIs to remove RRF vessels from certificated status if deficiencies remain uncompleted beyond the allowable time limit established in the MOU. This is not intended to be viewed by either party to the MOU as being a punitive measure. The intention of this provision is to match inspections to those periods when actual repairs or operations are being conducted. OCMIs should focus inspections on those periods when the vessel is ready to make repairs, conduct tests or demonstrate the proper operation of equipment or systems. If for whatever reason an RRF vessel cannot conduct required repairs, tests or inspections before the time limit, it lapses into a period during which its COI is no longer valid. However, realizing that ultimately MARAD may seek to recertificate the vessel at a future date, OCMIs should retain vessel files, update records of the vessel and witness equipment tests and repairs when requested by MARAD or their authorized representative. The goal of both MARAD and the Coast Guard in the inspection process is to maintain RRF vessels in a certificated status with valid COIs in the possession of the vessels' operator. Ideally, the only outstanding deficiencies on any RRF vessel in phase IV should be to witness reinstallation and testing of equipment which has been intentionally removed to prevent damage during extended periods of deactivation.

4. National Defense Waiver Requests

When necessary, national defense waiver requests will be coordinated between MARAD and the Department of Defense (DOD) and submitted under authorized DOD signature to the Coast Guard. The previous MOU required the same level of coordination, but directed MARAD to sign and submit the waiver form. Regulations contained in 46 CFR Part 6 give DOD the right to waive inspection requirements for the purpose of national defense for vessels operated or chartered by DOD, in this case RRF vessels. Other government agencies may request a waiver of inspection requirements based on national defense for the Coast Guard's consideration if "the urgency of the situation outweighs the marine hazard involved" (46 CFR 6.01(b)). Because of MARAD's location within the Department of Transportation, vice DOD, the Coast Guard could deny their requests for national defense waivers if, in the opinion of the Coast Guard, it did not meet the test of the regulations. This change to the MOU places the evaluation of the level of hazard to RRF vessels and crew with DOD when the primary consideration is national defense. The Secretary of Defense has delegated signature authority for national defense waivers to the Commander, Military Sealift Command.

CHAPTER 6: POLLUTION PREVENTION

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CHAPTER 6: POLLUTION PREVENTION

A. INTRODUCTION

The oceans and waterways of the world have long been used by the maritime community, shoreside industries, and municipalities as catchalls for domestic and industrial wastes. Pollution results from acts of commission and omission. In either case, the technology is available or is being developed to measure and combat the detrimental effects of pollution.

1. Waterways Pollution

Our waterways are susceptible to pollution from many sources. Particulates are discharged into the air from industrial, utility, and transportation systems, and eventually enter the water through rainfall runoff or direct discharge. Ground water carries pesticides and other pollutants from rural areas into the waterways. There has been a rapid increase in the bulk transportation of hazardous substances on the nation's waterways. Oil and petroleum based products are highly visible examples, but by no means the only substances of this type (nor the most dangerous) that are moving continually through U.S. waters. The likelihood of catastrophic incidents involving these substances is a matter of constant concern. Less spectacular, everyday incidents such as vessel collisions and groundings, and failures of cargo transfer systems, also result in the pollution of the marine environment. Pollution can occur in the ocean transport of oil in bulk quantities due to tank cleaning and ballasting operations, as well as the ballasting of fuel tanks in other types of vessels. Yet another pollutant, sewage finds its way into the water system. While municipal, private, and industrial sewage systems contribute the largest percentage of sewage to the waterways, a significant amount originates from commercial and private vessels.

2. Legislation

Recognizing the pollution situation, Congress enacted legislation to restrict the discharge of pollutants into U.S. waters and to punish violators. Among these enactments are:

a. The Federal Water Pollution Control Act (FWPCA), as amended, 33 U.S.C. 1251 et seq.;

b. The Ports and Waterways Safety Act (PWSA), as amended, 33 U.S.C. 1221 et seq.;

c. The Port and Tanker Safety Act (PTSA), 33 U.S.C. 1221 and 46 U.S.C. Chapter 37;

d. The Marine Protection, Research and Sanctuaries Act (MPRSA), 33 U.S.C. 1401 et seq.;

e. The Act to Prevent Pollution From Ships (APPS), 33 U.S.C. 1901 et seq., resulting from the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78); and

f. The National Environmental Policy Act (NEPA), 42 U.S.C. 4321 et seq.).

NOTE: See MSM Volume I for a more detailed explanation of these acts.

3. FWPCA and MARPOL 73/78

The principal statutes for controlling marine pollution are the FWPCA and APPS (MARPOL 73/78), which provide for the prevention of marine pollution by oil, hazardous substances, and sewage. The FWPCA further provides for early detection and notification of federal authorities of discharges, enforcement actions in the event of violations, response and cleanup activities, and the regulation of marine sanitation devices (MSD's) to comply with the standards set by the Environmental Protection Agency (EPA). It is the prevention aspect of the FWPCA and MARPOL 73/78, and their supporting regulations, that are addressed in this chapter.

4. Prevention Aspect

The prevention aspect of the FWPCA and MARPOL 73/78 and their implementing regulations include the control of commodity handling operations, and the design and construction of vessels and facilities (onshore and offshore), to minimize the occurrence of harmful discharges. To this end, federal responsibility for pollution prevention is shared between the Coast Guard and EPA. The latter is responsible for all facilities, onshore and up to 200 miles offshore, that are not transportation-related. Included in the definition of such facilities are those that drill, produce, gather, store, process, refine, transfer, distribute, or consume oil and hazardous substances (see 40 CFR 112). The Coast Guard, under the authority of 33 U.S.C. 1321(j)(1), promulgates regulations that provide equipment requirements, operating procedures, and training of personnel from vessels and "transportation-related" facilities.

B. Oil Pollution Prevention Requirements

1. Regulations

The regulations for the prevention of water pollution are authorized by Section 311(j)(1)(C) and (D) of the FWPCA, as amended (33 U.S.C. 1321 et seq.). Revised regulations, 33 CFR 154-156, became effective on 3 March 1980. The regulations were revised to better address routine operations, such as cargo tank cleaning, bilge pumping, ballasting, equipment failure, and human error which are the most frequent causes of oil spills. These operational spills can be prevented by maintenance and testing of equipment, personnel awareness, and proper procedural requirements.

2. Intent

The intent of the regulations is to prevent pollution through "good marine practice" as well as compliance with "the letter of the law." If violations are detected during routine inspections, correction is the initial action to be taken; this shall be followed by a Report of Violation and formal penalty action, if appropriate (see volume I of this manual).

C. REQUIREMENTS FOR OIL TRANSFER FACILITIES (33CFR154)

1. Applicability (33 CFR 154.100)

General

a. General. The regulations are aimed at preventing discharges that threaten substantial pollution of U.S. navigable waters by oil. They are not intended only to collect civil penalties. If violations are detected during routine inspections or examinations, correction is the primary objective. Marinas normally do not transfer oil in quantities that justify stringent regulation. Also, Coast Guard personnel are not available to monitor all minor oil transfer operations. Marinas, however, are subject to 33 CFR 154 when transfers involve vessels having capacities of 250 barrels (10,500 gallons) or more of oil. A genuine risk of pollution is posed by such vessels, even when lesser quantities of oil are actually transferred. 33 CFR 154 applies to onshore facilities as defined in Section 311(a)(10) of the FWPCA, and to offshore facilities within U.S. navigable waters.

Federally Owned and Operated Facilities

b. Federally Owned and Operated Facilities. Federal facilities, regardless of the character of the vessels they service, come under the purview of 33 CFR 154 and 156 (this includes Department of Defense (DOD) and Coast Guard facilities). Primary responsibility for enforcing the requirements of 33 CFR 154 and 156 at federally owned and operated facilities resides with the federal agency owning and operating the facility, not with the Coast Guard. However, consistent with its general enforcement responsibility and in the public interest, the Coast Guard will:

(1) Support and assist the efforts of the federal agency involved to comply with the pollution prevention regulations.

(2) Conduct inspections and monitor transfer operations at such facilities, and enter such facilities to gain access to commercial vessels berthed there, when approval is granted by the cognizant federal agency.

(3) Advise other agencies of violations, when observed or reported, and of requirements that must be met to achieve compliance.

(4) When a violation is observed at a federally owned and operated facility, the captain of the port (COTP) shall:

(a) Formally advise the responsible official of the violation(s);

(b) Explore all possible means of resolving the matter and achieving compliance; and

(c) Submit relevant documentation to the district commander for disposition if compliance is not forthcoming.

Upon receipt of documentation from the COTP indicating violations at such facilities, the district commander shall explore all possible means of reaching a mutual agreement for achieving compliance. Such efforts shall be undertaken with the district commander's counterpart in the cognizant agency, e.g., the regional administrator, district commandant, district engineer. Such efforts should be fully documented. If this procedure fails to achieve a resolution of the situation, provide Commandant (G-M) all relevant information for resolution with the parent agency.

Federally Owned, Privately Operated Facilities

c. Federally Owned, Privately Operated Facilities. Routine enforcement policy and procedures apply to violations at such facilities.

2. Definitions (33 CFR 154.105)

The definition of "transfer," added to 33 CFR 154-156 clarifies the applicability of the regulations to transfers of oil within vessels. The definition of "oil" in Section 311(a)(1) of the FWPCA applies to these regulations. "Oil" does not include liquefied flammable gases, nor any substance designated by EPA as a "hazardous substance" in 40 CFR 116. It does include animal and vegetable oils. The regulations apply to bulk transfers of any kind of oil to or from a vessel having a capacity of 250 barrels or more.

3. Alternatives (33 CFR 154.107)

This subpart was reworded so that the COTP may consider both economic and physical conditions when reviewing a proposed alternative. However, the intent of the regulations should not be circumvented without good reason, even where alternative protection is afforded. Alternative requests should document the equivalency of protection.

Documentation

a. Documentation. Documentation of alternatives, including safety and pollution protection measures, is required. The COTP may request additional information, if necessary, to evaluate the proposed alternative. A request will necessarily include an economic and environmental analysis. As an equivalent level of protection is required, no formal environmental impact statement is necessary.

Waivers

b. Waivers. As waivers from compliance are now distinguished between alternatives (granted by the COTP) and exemptions (granted only by the Commandant), COTP's shall review waivers that were granted under the initial regulations, to determine those that must be submitted to Commandant (G-M) for re-approval as exemptions. Most requests for deviations from the regulations should be processed as alternatives. A request that provides an alternative means of compliance should not be treated as an exemption request simply because numerous facilities scattered throughout several COTP zones are involved. Alternative procedures approved by the COTP should be described in the operations manual as well as the COTP's facility file.

4. Exemptions

Where appropriate, exemption requests forwarded to Commandant (G-M) shall include observations or assessments of the situation from the COTP. These will aid in determining whether or not to grant an exemption. Exemption requests shall be forwarded to the Commandant only when all means of alternative compliance have been exhausted. (33 CFR 154.108)

5. Letter Of Intent

The "operator," for purposes of the letter of intent, is the party responsible for the facility. This may not necessarily be an individual; if a corporation owns and operates a facility, the "operator" is that corporation and not any operating employee. (33 CFR 154.110)

6. Facility Examinations

Normally, examinations for compliance with 33 CFR 154 and 156 are conducted during working hours. However, the COTP shall conduct examinations whenever the facility is operational, as deemed necessary. Facility inspections shall proceed inshore from the dock area as far as necessary to identify the "oil transfer system," including the piping arrangement used to transfer oil to or from the storage or processing operations. (33CFR154.120)

7. Requirement for Operations

Each facility shall have an operations manual sufficient to guide a person generally qualified in oil transfer operations in performing his or her duties in an environmentally safe manner. The manuals are intended to be "working" documents for the benefit of personnel involved in oil transfer operations. At a minimum, they must be understood by all who are designated as persons-in-charge (PIC). The operations manual should be the single source for learning standard operations as well as emergency procedures at a facility. Small facilities should have simple manuals; larger, multiproduct facilities require more comprehensive manuals. The requirement to send a copy of the operations manual with the letter of intent enables the COTP to verify that the owner/operator has established procedures for the facility to operate in an environmentally sound manner. The contents of certain manuals may be proprietary in nature. Therefore, the contents of operations manuals normally shall not be released to others unless authorized in writing by the facility owner/operator. Seek legal advice if requests for information are received. Manual (33 CFR 154.300)

8. Contents of Operations Manual

Personnel should know the locations of all required safety equipment. Providing cargo information is the responsibility of the vessel operator. This data must be readily available to facility personnel for safety and environmental reasons. Listing personnel names and telephone numbers on a separate sheet for easy amendment is a good idea; the regulations permit the operations manual to be in loose-leaf form for this purpose. (33 CFR 154.310)

9. Letter of Adequacy for Operations Manual

COTP's review operations manuals for the facilities in their zones. New facilities, and those making substantial changes to their existing manuals, must follow the procedure set forth in 33 CFR 154.320(b). A letter of adequacy addresses the scope of the manual's contents and ensures that certain information is covered in the manual, but does not constitute Coast Guard approval or certification of any particular procedure or equipment mentioned. (33CFR154.325)

10. Hose Assemblies

Maximum Allowable Working Pressure (MAWP)

a. Maximum Allowable Working Pressure (MAWP). 33 CFR 154.500(b) requires oil transfer hose assemblies to have a MAWP more than the sum of the relief valve setting (or the maximum pump pressure when no relief valve is installed) plus static head pressure of the transfer system, at the point where the hose is installed. For more information on testing pressures, see subparagraph MSM II-B6.E.8.b below. (33CFR154.500)

Marking

b. Marking. 33 CFR 154.500(e)(1) requires marking the MAWP on the hose. Do not mark burst pressure or test pressure on the hose. Pressures other than MAWP that are marked on hoses presently in use may be obliterated by any suitable means until replaced by hose with proper markings. There is no need to test back pressure nozzles, as they are reliable for the small hoses with which they are used. They are not intended for large hose, which is not used with flush deck fittings.

11. Loading Arms

The intent of this section is to provide a uniform and safe standard that is not subject to undue modification; an alternative under 33 CFR 154.107 may be requested for locally constructed arms. To avoid expensive retrofitting, only loading arms installed after 30 June 1973 are regulated. Manufacturers should be consulted in questionable cases. (33CFR154.510)

12. Monitoring Devices

The primary purpose of this section is to provide monitoring systems for the detection of spilled oil to ensure adequate and rapid clean-up efforts. This requirement is intended only for those cases in which visual surveillance is insufficient to detect oil spills in very sensitive areas, or in which a complex operation would likely result in a large spill without the presence of a monitoring device. In such cases, use of the oil monitor should significantly increase the probability of detection or limit the spread of spilled oil through early detection. It would be economically unreasonable to require monitoring devices at all transfer facilities. (33 CFR 154.525)

13. Small Discharge Containment

The intent of this section is to control small leaks at connecting points until emergency shutdown or proper removal is possible. Containment under the entire hose is not required or intended. Blanking of hose until connected, and use of hose complying with 33 CFR 154.500 requirements, should prevent most over-water spills. (33 CFR 154.530)

14. Discharge Removal

The optimum arrangement is a fixed drain system to remove discharges and normal precipitation from the facility. In general, the system should be either mechanically operated or gravity-operated. The phrase "safely and quickly" must be considered relative to the products involved. This section is intended to keep large surface areas of highly volatile products, such as gasoline, from forming, and to provide a means to drain precipitate or other liquids from the containment, so that the required capacity is available during the transfer. In the case of a portable containment system, its potential weight when full must be considered, and provisions must be made for emptying it. A system is unacceptable if the most likely action by the owner/operator is to drain the container into the water. (33 CFR 154.540)

15. Discharge Containment Equipment

Pre-transfer Booming

a. Pre-transfer Booming. Only unusual situations require pre-transfer booming, and there should be no great variance among COTPs in interpreting the regulation. The authority to require containment to be deployed before the transfer is mentioned specifically, because in some cases it is the only practical way to protect the environment from particularly risky transfer operations. (33 CFR 154.545)

Time Limits

b. Time Limits. Under 33 CFR 154.545(c), time limits for gaining access to oil spill containment materials shall be set by the owners/operators of the facilities, subject to approval by the COTP. This helps ensure that equipment-sharing agreements among facility owners/operators are realistic and provides for adequate response to oil discharges. The operator must take currents into account when establishing time limits for boom deployment. Although booms may not contain oil when deployed in rapid currents, they may be effective in channeling its movement, and thus protect some areas from damage.

Equipment

c. Equipment. Each facility must have containment equipment available, whether by direct ownership, membership in a cooperative, or prearrangement with commercial interests. Shared or contracted equipment must be located so as to be brought on-scene in a timely manner. The determination of location and timeliness should reflect local conditions; in current or tidal areas, the time to deploy will generally be less than that allowed for still water areas. In locations adjoining ecologically sensitive areas, booms may need to be set in place for each transfer operation. Each facility should be prepared to contain and remove a discharge in accordance with these regulations, the National Contingency Plan (NCP), and 33 CFR 153.

16. Emergency Shutdown 33 CFR 154.550

Facility to Vessel

a. Facility to Vessel. This section applies specifically to the transfer of oil from facility to vessel. As the person-in-charge on the vessel must be able to stop loading immediately in the event of manifold valve failure, hose failure, or overfill, the emergency shutdown mechanism should normally be located aboard the vessel. Among the factors to be considered by the COTP in authorizing single-operator transfers (see 33 CFR 156.115) is the accessibility of the shutdown mechanism.

Alternative Measures

b. Alternative Measures. In the event that the person-in-charge on the vessel does not remain near to the "usual operating station" where the shutdown controls are located, acceptable alternative measures must be provided to maintain the emergency shutdown capability. Acceptable alternatives must provide for continuous dedicated communications. An audible alarm system is not acceptable.

Flow Closure Devices

c. Flow Closure Devices. The flow closure devices actuated by the shutdown system must be located on the facility side of the hose. If their use may cause hydraulic shock to the system, the system must be capable of withstanding such shock loading. Proper closure sequencing of pumps and valves may be necessary (e.g., the pumps must be stopped prior to closing the pipeline to prevent rupture), and is certainly not precluded, provided the applicable time limit is met.

17. Communications 33 CFR 154.560

Two-Way Communications

a. Two-Way Communications. Adequate communications between the vessel and the facility are essential to coordinate control of the transfer operation. Two-way voice communications enable each person-in-charge to hear the other. In the event that these persons are not close enough to be readily heard by voice alone, the facility shall provide an effective means of communications. For single-operator transfers, and at facilities with low ambient noise levels, an electronic or sound-powered system may not be necessary. Consideration must be given, however, to the probable location of personnel during various stages of transfer operations and in inclement weather, to ensure that two-way communications are possible.

Intrinsically Safe Radio Devices

b. Intrinsically Safe Radio Devices. Radio devices used to comply with this requirement must be approved as intrinsically safe by either Underwriters Laboratories, Inc. (UL), Factory Mutual Research Corporation (FM), Canadian Standards Association (CSA), or MET Testing Company (MET). [NOTE: Intrinsically safe radios are not required on vessels certificated to carry and carrying only Grade E liquid cargoes.]

18. Lighting 33 CFR 154.570

Adequate lighting is a prerequisite for any nighttime operation. Objective standards are needed where the COTP doubts the adequacy of lighting. Only when lighting appears inadequate to the COTP (i.e., a flashlight should not be necessary to conduct operations effectively) is specific testing necessary. At small or remote facilities, where portable lights are used or illumination is provided by a tug, the shielding of lights shall be specified in the operations manual and in the written directions for transfer operations.

D. REQUIREMENTS FOR VESSELS (33CFR155)

1. Applicability
33 CFR
155.100

Introduction

a. Introduction. U.S. vessels must meet the applicable requirements of 33 CFR 155 to be issued a Certificate of Inspection (COI) under the applicable subchapters of Title 46, CFR. Public vessels that would otherwise be exempt from compliance must meet these requirements, if they are to be certificated by the Coast Guard. These include vessels operated as maritime school ships and vessels of the Navy's Military Sealift Command (MSC). Consequently, a vessel's COI will be accepted as evidence that it is in compliance with 33 CFR 155.

International Oil Pollution Prevention (IOPP) Convention Certificate

b. International Oil Pollution Prevention (IOPP) Convention Certificate. Foreign and U.S. ships are required to be surveyed for compliance with MARPOL 73/78. An IOPP Certificate with the applicable supplement (Form A or Form B) will be accepted as evidence that the vessel complies with 33 CFR 155 pollution prevention requirements.

Enforcement

c. Enforcement. Primary responsibility for enforcing the regulations for public vessels rests with the federal agency owning and operating the vessel, not with the Coast Guard. However, consistent with its general enforcement responsibility and in the public interest, the Coast Guard will:

(1) Assist the efforts of the federal owner/operator of a public vessel certificated by the Coast Guard to comply with the pollution prevention regulations by providing information and advice.

(2) Conduct inspections and monitor transfer operations on board such a vessel only when requested and approved by the cognizant federal agency, or during renewal of the COI.

(3) Advise other agencies of violations, when observed or reported, and of requirements that must be met to achieve compliance.

(4) When a violation is observed on a certificated public vessel, the COTP shall:

(a) Formally advise the responsible official of the violations;

(b) Explore all possible means of resolving the matter and achieving compliance; and

(c) Submit relevant documentation to the district commander for disposition if compliance is not forthcoming.

Upon receipt of documentation from the COTP, the district commander shall explore all possible means of reaching mutual agreement to achieve compliance. If this fails to resolve the situation, forward all relevant information to Commandant (G-M) for resolution with the parent agency.

Tank Barges

d. Tank Barges. Tank barges that are inspected under 46 CFR, Subchapter D (Tank Vessels) or Subchapter O (Certain Bulk Dangerous Cargoes) for the carriage of flammable or combustible cargoes that are not considered "oil" need not meet the requirements of 33 CFR 155. In such cases, the COI should be endorsed "33 CFR 155 need not be complied with unless oil is carried." However, oceangoing tank barges over 150 gross tons (GT) must meet the survey requirements and be issued an IOPP Certificate with Supplement Form B attached.

Permanently Moored Vessels

e. Permanently Moored Vessels. For the purposes of the regulations, a vessel that is permanently moored at a fixed location, so as to be "substantially a land structure," may be considered an integral part of the facility, regardless of its current use as a pumping facility, temporary storage facility, or work platform. So as not to be subject to the provisions of 46 U.S.C. 3701, the vessel must be so securely and substantially moored by such means as cables, chains, structural steels, etc., to an onshore structure that it may be considered substantially part of that structure (see Chapter 10 of this volume). Vessels used as holding facilities, which have flammable or combustible liquid cargo in bulk aboard for any purpose other than specified below, shall be inspected as tank vessels, unless they meet these provisions.

Vessels with Containment Systems

f. Vessels with Containment Systems. The inspection provisions do not apply to floating vessels that have flammable or combustible liquids within a containment system installed solely for compliance with 33 CFR 154.530, when such liquids would be routinely discharged to the shoreside part of the facility. Although floating non-tank vessels with containment systems only, will not be subject to inspection under 46 U.S.C. Chapters 33 and 37, all on board components, such as piping, collection and holding tanks, vents, and pumps shall be examined for safety and satisfactory operation as part of the facility examination referred to in 33 CFR 154.120.

2. Definitions 33 CFR 155.110

Oceangoing

a. Oceangoing. MARPOL 73/78 operational and equipment requirements center on whether the ship is "oceangoing" and a "new ship" or an "existing ship." A U.S. "oceangoing" ship is a vessel that is certificated for ocean service or operates at any time beyond the U.S. territorial sea. All foreign ships are "oceangoing," except those operated exclusively within the Great Lakes or Puget Sound or their connecting and tributary waters.

NOTE: Check the applicability section of the regulations for a particular vessel.

New or Existing Ship

b. New or Existing Ship. Three dates are key to determining a vessel's status as "new" or "existing": the vessel's contract date, keel-laying date, and the delivery date. Ships with either a delivery date after 31 December 1979 or a contract date after 31 December 1975 are considered "new." If the contract date is unavailable, the keel-laying date shall be obtained from the ship's International Convention for the Safety of Life at Sea (SOLAS) Safety Construction Certificate. If the keel-laying date is after 30 June 1976, the ship is "new." If the ship's owner/operator provides documentation that the ship's contract date was before 31 December 1975, the ship is considered "existing," as the contract date takes precedence over the keel-laying date. A determination by a party nation on a specific ship's status under MARPOL 73/78 should be accepted by the local unit. If an obvious error has been made concerning a vessel's status, the COTP should contact Commandant (G-MPS-1). The local unit shall accept a party nation's determination as to whether a ship conversion is "major" or "minor." In the absence of such a determination, the COTP should apply the definitions and interpretations in MARPOL Regulations 1(6) through 8.

3. Equivalents 33 CFR 155.120

Equivalents for MARPOL 73/78 requirements are granted by Commandant (G-M) only. MARPOL 73/78 disallows the substitution of operational methods to control the discharge or oil for a design construction feature. The equivalents granted by the U.S. are contained in enclosure (7) of Commandant Instruction (COMDTINST) M16450.26. Equivalents allowed by foreign countries and acceded to by the U.S. are contained in enclosure (8) to COMDTINST M16450.26. Refer questions concerning equivalents to Commandant (G-MPS-1). It should be noted that for vessels operating exclusively in U.S. domestic service for which the oil transfer procedures calls for the use of an equivalent shore connector, a 1.5-inch quick connect fitting is permitted. This equivalence does not apply to vessels in international service nor to oceangoing vessels of 400 or more gross tons.

4. Exemptions 33 CFR 155.130

When appropriate, exemption requests forwarded to Commandant (G-M) shall include observations or assessments of the situation from the COTP. These will aid in determining whether or not to grant an exemption. Exemption requests shall be forwarded to the Commandant only when all means of alternative compliance have been exhausted.

5. Cargo Oil Discharge Containment 33 CFR 155.310

General Provisions

a. General Provisions. The language in this section was changed to clarify the containment requirements for hoses and loading arms, and to require the specified capacity in all conditions of vessel list or trim during the transfer operation. Barges are allowed an option, unavailable to other tank vessels, to use a coaming in lieu of a large containment system. This option exists because the deck construction on many barges makes large, fixed containment impractical or unsafe. Generally, however, coamings installed around the periphery of a vessel should not be allowed in lieu of containment. The safety problems in utilizing the total deck enclosure for containment include conditions of list or trim, rain accumulation, required methods of product removal, fire hazards, structural considerations, and personnel safety. A coaming that is used in lieu of a fixed containment system must be able to keep spilled oil within the coaming and portable containers until properly drained or removed, without discharge into the water.

Drainage

b. Drainage.

(1) Acceptable mechanical means of drain closures include valves, threaded caps or plugs, or solid stoppers (e.g., rubber plugs) in conjunction with concrete (provided the concrete remains sound.) Concrete, plastic or wooden plugs alone, or rags in any fashion, are unsuitable. Rags are never suitable. The present requirements of 46 CFR 35.35-10 for plugging general deck scuppers remain valid.

(2) Drainage installations should be compatible with existing regulations, which require a check valve in the drain line, if flammable liquids are carried, and there is a direct connection of the line to a cargo tank. Drains need not be piped to cargo tanks. Alternative means of containment drainage must not create a potential for discharge. A drainage system will not be accepted when the most likely result is discharge of oil into the water or the bilges of auxiliary spaces, or the mixing of incompatible products. Use of collection tanks is encouraged; pumping of contained oil into portable drums or containers is discouraged. Arrangements between the vessel and the facility for removal of oil spilled into containment systems shall be undertaken in a timely manner.

6. Fuel Oil and Bulk Lubricating Oil Discharge Containment 33 CFR 155.320

Applicability

a. Applicability. 33 CFR 155.320 has been revised to require containment when lube oil is transferred and carried in bulk as stores for consumption by the vessel. This section generally applies to the area immediately surrounding the fueling station and associated vents. It does not apply to:

(1) The vent header system;

(2) "Flush deck fittings," even though raised slightly off the deck to prevent the entry of water; and

(3) Vents for small independent auxiliary fuel tanks, such as used on barges for pump drive engines, when the tank is designed to be filled with a back flow shut-off nozzle or similar arrangement.

This regulation applies to fuel tank vents fitted with goosenecks as opposed to straight-type vents, which are common on foreign vessels. Most straight-type vents will discharge oil in a 360-degree horizontal pattern that rules out the use of portable containers. Using the bulwarks to keep the oil on the vessel and relying on coamings or plugged scuppers to contain the discharge is unacceptable. Generally, straight vents will require fixed containment around the vent head or modification of the vent itself.

Piping Arrangements

b. Piping Arrangements. Unusual or complex piping arrangements on existing vessels need not be retrofitted if, in fueling the vessel, an equivalent level of protection can be demonstrated (see 33 CFR 155.107). For example, regulations imply the use of external containers. However, devices built into a vent line or a system to contain the required amount of oil, while still permitting the vent to function, will satisfy these requirements. Vent header systems that lead to a final tank for containment are also acceptable. Alternative procedures, methods, or equipment standards shall be clearly explained in the oil transfer procedures for the vessel. This requirement for containment under fuel oil and bulk lubricating vents does not apply to fixed or floating drilling rigs and other platforms.

NOTE: Such devices must be brought to the attention of marine chemists and must be capable of gas-freeing.

Capacity Requirements

c. Capacity Requirements. In general the capacity of the required fixed discharge containment for fuel oil and bulk lubricating oil vents, overflows, and fill pipes is the volume as specified in 33 CFR 155.320, for each vent, overflow, etc. However, in some cases one fixed discharge containment may suffice for more than one such vent, overflow, or fill pipe. In determining whether the required capacity for a single fixed containment is adequate for a group of vents, overflows, or fill pipes, the distance between the individual devices must be considered along with the location of the associated tanks, the related piping configurations, etc. The final containment design must ensure the containment provided for a group of vents, overflows, etc., has the capability to retain expected discharges.

7. Bilge Slops/Fuel Oil Tank Ballast Water Discharges Aboard U.S. Non-Oceangoing Ships 33 CFR1 55.330

Oily Wastes and Bilge Slops

a. Oily Wastes and Bilge Slops. Most vessels have a waste or slop oil tank. All vessels must have the ability to retain oily waste and oily bilge slops aboard. Use of the bilge itself is acceptable on vessels that have essentially dry bilges, which collect only small quantities of machinery oil drippings. Vessels with wet bilges that are essentially oil-free need not provide a special tank for bilge water disposal. Such arrangements in no way constitute an exemption from assessment of a penalty for discharging a harmful quantity of oil.

Discharge of Oily Wastes and Bilge Slops

b. Discharge of Oily Wastes and Bilge Slops. Proposals to pump oily wastes and oily bilge slops to fuel tanks or ashore through the bunkering lines have been accepted when proper safeguards have been incorporated. The acceptance of such proposals has raised questions regarding the applicability of 46 CFR 56.50-50(h). This paragraph will be revised to permit the discharge of oily wastes and bilge slops to fuel tanks and tanks ashore through bunkering lines. The system must be arranged to preclude the discharge of fuel into the bilge system. Normally, double check valves (one of these, a stop check valve) will be required between the bilge pump discharge and the bunkering line or fuel tank. The discharge to the fuel tank must enter the top of the tank, if possible. The requirement to have an oily residue (sludge) tank does not apply to U.S. non-oceangoing vessels.

8. Bilge Slops/Fuel Oil Tank Ballast Water Discharges on Oceangoing Ships of Less Than 400 GT 33 CFR 155.350

Ships in this category must either retain aboard all oily mixtures and be equipped to discharge them, by fixed or portable means, to a reception facility or have approved oily-water separating equipment. Commandant (G-MVI-3) should be contacted to verify that an oily-water separator has been approved by the International Maritime Organization (IMO). Ships in this category are not required to have a bilge alarm or bilge monitor installed. Ships failing to have the applicable equipment aboard should be processed for civil penalty assessment. For vessels which have separating equipment installed but inoperative, civil penalty proceedings should be used if reasonable efforts have not been made to make repairs; and the ship should be detained in port until the discrepancy is corrected.

U.S. Self-Propelled Ships of ≤400 GT

a. U.S. Self-Propelled Ships of ≤400 GT. U.S. self-propelled ships of ≤400 gross tons. May retain all oily mixtures on board in the ship's bilges. An oily residue (sludge) tank is not required.

Nonself-Propelled Ships with Auxiliary Machinery <2000 HP

b. Nonself-Propelled Ships with Auxiliary Machinery <2000 HP. Nonself-propelled vessels outfitted with machinery of <2000 HP typically do not present a significant risk of oil pollution from the machinery space bilges. These vessels, in most configurations, are not fitted with a large number of through-hull fittings, nor do these types of vessels employ large amounts of water for cooling and steam plant operation. Therefore, a minimal amount of water is normally found in the bilges of these vessels.

Equivalency

c. Equivalency. An equivalency has been established between a nonself-propelled barge with installed auxiliary machinery having a total output of less than 2000 HP in spaces protected by bilge pumping and a self-propelled ship of 400 gross tons or less. Barges eligible for the equivalency need not have oil water separators (OWS) if they comply with the requirements set forth in 33 CFR and 155.420(a) for oily bilge slop retention and shore discharge pumping, piping, and discharge connections for oceangoing ships of 100 gross tons and above but less than 400 gross tons. As already required by 46 CFR 56.50-5(e), drip pans must also be installed on inspected vessels under any equipment subject to normal oil leakage.

Equivalency requests for barges should be evaluated for eligibility under approved equivalency for barges with auxiliary machinery having a total output of less than 2000 HP. The OCMI may authorize an eligible barge, whose owners chooses not to install an oily water separator (OWS), to be operated in accordance with the approved equivalency by making the following entry in paragraph 6.1 of the Form A Supplement to the IOPP Certificate (or paragraph 10.1 of Form B, if applicable):

"2.2, 2.3, and 3 - the machinery space pollution potential of this vessel is equivalent to that of ships of less than 400 gross tons. The vessel is therefore outfitted to comply with the requirements of Regulations 9(2). All oil and oily wastes must be retained on board for discharge to reception facilities."

9. Bilge Slops Discharges—Oceangoing Ships ≥ 400 GT, < 10,000 GT, Excl. Ships That Carry Ballast Water In Their Fuel Oil Tanks

Vessels of this category must have, at a minimum, an oily-water separator capable of producing an effluent of less than 100ppm of oil. They must also have a tank for oily residues (sludge) that cannot be handled through the oily-water separator. Additionally, these vessels must have pipelines installed for the discharge of oily mixtures to waste reception facilities. (33 CFR 155.360)

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10. Bilge Slops/Fuel Oil Tank Ballast Water Discharges on Oceangoing Ships ≥ 10,000 GT, and Oceangoing Ships ≥ 400 GT That Carry Ballast Water In Their Fuel Oil Tanks

In addition to an approved oily-water separator, such vessels must also have an approved bilge monitor or alarm. If the vessel owner chooses a system with an approved bilge monitor, the continuous monitor record shall be maintained aboard the vessel for 3 years from the date of the last entry on that record. (33 CFR 155.370)

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11. Oily-Water Separating Equipment, Bilge Alarm, and Bilge Monitor Approval Standards

Commandant (G-MVI-3) should be contacted when there is a question concerning such equipment approved by the IMO. (33 CFR 155.380)

12. Pumping, Piping, and Discharge Requirements for Oceangoing Ships of ≥100 GT, but <400 GT

This regulation requires a means on the weather deck near the discharge outlet to stop each pump that is used to discharge oily wastes. This requirement may be satisfied by an installed pressure switch that shuts down the pump that is discharging oily wastes when the stop valve is closed. (33 CFR 155.420)

13. Placard

The placard shall be posted, as specified, in any machinery space that generates or collects oily waste (e.g., auxiliary spaces on unmanned barges). Pleasure boats 26 feet or more in length must also comply with this provision. (33 CFR 155.450)

14. Prohibited Oil Spaces

This section applies to all self-propelled vessels. Where collision bulkheads are not fitted, the requirement applies to the forwardmost continuous bulkhead. (33 CFR 155.470)

15. Designation of Person-In-Charge (PIC)

The operator or his or her agent must designate in advance individuals who may serve as persons-in-charge; a current list of such individuals should be available. The person who signs the Declaration of Inspection (DOI) described in 33 CFR 156.150 is the "person-in-charge" until his relief signs the DOI. (33 CFR 155.700)

16. Oil Transfer Procedures

The intent of this section is that written directions for oil transfer operations must be aboard whenever the vessel is in service, although they are used only during transfer operations. 33 CFR 155.720(b) was added because the Coast Guard has documented spills from fuel day tank transfers, cargo tank transfers, and other internal vessel transfers. The Pollution Incident Reporting System (PIRS) documented approximately 140 spills per year from such transfers from 1973-1977. The written procedures for internal vessel oil transfers need not be so complex as for cargo or fuel transfers to a facility or another vessel; however, they should be available for reference before and during internal transfers. (33 CFR 155.720)

17. Availability of Oil Transfer Procedures 33 CFR 155.740

General

a. General. The intent of this section is that vessel personnel involved in oil transfer operations know the necessary procedures, regardless of language differences. Vessel owners and operators may decide what crews to hire, but whoever supervises the transfer must be able to perform with minimal risks of pollution. Transfer procedures need not be posted on unmanned tank barges, but must be readily available to transfer personnel. On tank vessels, detailed data and procedures need not be permanently posted, but must be kept aboard the vessel in a place that is accessible to personnel involved in the transfer.

Posted Procedures

b. Posted Procedures. Directions for transfer operations, with the contents required by 33 CFR 155.750, can be written simply enough to be posted; no separate manual is necessarily required. Such directions are not intended as training manuals for tankermen, but they must explain any abnormal or complicated instructions so that the transfer system may be operated safely. On an unmanned tank barge, for example, a simple line drawing of the piping arrangement showing any unique features and properly labeled, may suffice. Emergency phone numbers shall also be entered in these procedures.

18. Contents of Oil Transfer Procedures 33 CFR 155.750

This regulation requires detailed information for the oil products transferred to or from a vessel. Its intent is to ensure that the prevention regulations are applied to all oil products transferred in bulk. Tank barges have had difficulty keeping oil cargo information on board due to space limitations, and because 33 CFR 155.750(a)(1) has been strictly interpreted to require a separate cargo information card for each cargo for which the barge is certificated. As this section is intended to provide the tankerman or person-in-charge with information on the hazards and correct handling of the products with which he or she is dealing, only information cards for cargoes actually aboard should be required. Cargoes with similar characteristics can be listed together on one information card for convenience; however, those cargoes with significantly different characteristics (such as different grades) should be listed separately. Marine safety personnel should:

a. Point out essential cargo information, such as special hazards, if the cargo is different from oil, and procedures for oil spills;

b. Allow summary data where feasible; and

c. Allow revision of the procedures under 33 CFR 155.760, when legitimate problems arise in existing procedures.

19. Emergency Shutdown

This section addresses the transfer of oil from a vessel to a facility or to other vessels. Installation of additional remote shutdown stations may be necessary, depending upon the movements of the Person-in-Charge (PIC) during the transfer. In lieu thereof, consideration may be given the use of appropriate portable radio communications between the PIC and the crewmember located at the remote shutdown station. (33 CFR 155.780)

20. Communications

This regulation requires continuous communications to ensure that rapid shutdown of the transfer is possible. Voice communications may not be sufficient, due to ambient noise levels in the area or distance between persons-in-charge. (33 CFR 155.785)

21. Deck Lighting

The vessel is responsible for providing illumination consistent with the requirements of 33 CFR 154.570 to ensure pollution-free operation. The adequacy of existing vessel cargo deck lighting will normally be determined by practical demonstration. Verification by instruments may be required in questionable instances. (33 CFR 155.790)

22. Tank Vessel Security

Notwithstanding the provisions of 46 CFR 35.05-15(b), moored tank barges shall be kept under surveillance when they are not gas free. Boarding officers must assess each situation to ensure that local procedures satisfy the requirement for vessel security, in the particulars of mooring/berthing facilities, location of personnel acting as watchmen, environmental considerations, and other factors. (33 CFR 155.810)

23. Tank Vessel Integrity

The listed openings must be tightly shut, except as allowed by 33 CFR 155.815(b), to prevent the entry of water or loss of oil. When tank vessels have oil cargo or oil residue aboard while in U.S. navigable waters or the contiguous zone, they must comply with the provisions of this section. Tank vessels that are gas-freed are not covered by this section. (33 CFR 155.815)

24. Records

Records that must be maintained and "available for inspection by the COTP or OCMI" shall be readily available to Coast Guard personnel. In the case of unmanned tank barges, they generally will be kept with the vessel's COI. The licensed officer or certificated tankerman who will conduct the transfer operation in each locale shall be listed as required by 33 CFR 155.700. (33 CFR 155.820)

E. REQUIREMENTS FOR TRANSFER OPERATIONS INVOLVING VESSELS (33CFR156)

1. Applicability Government owned vessels engaged in commerce are subject to these requirements; other public vessels are usually required by agency guidelines to meet or exceed them. Transfers of oil to, from, or within a vessel are regulated, if the vessel has a capacity of 250 barrels or greater of "that" oil (including internal fuel and lube oil transfers, which have been the source of numerous spills in the past). The word "that" is emphasized to draw attention to its presence in 33 CFR 156.100 (also 33 CFR 154.100). The regulation was not meant to apply to a vessel with a cumulative on board capacity of 250 or more barrels of oil, but rather to vessels with an on board capacity of 250 or more barrels of a specific type of grade of oil. (33 CFR 156.100)

2. Suspension Orders The intent of this section is to allow for issuance of rapid suspension orders, when conditions threaten an imminent discharge of oil; the rule also allows suspension if Coast Guard personnel are not allowed access to inspect the operation to verify compliance. The COTP or officer in charge, marine inspection (OCMI) shall be advised immediately of any action to suspend a transfer operation (in most cases, he or she is consulted prior to any suspension order). In any event, the operator is free to immediately contact the COTP or OCMI to question the suspension order, or to advise of corrective action to have the order lifted. (33 CFR 156.112)

3. Person-In-Charge: Limitations 33 CFR 156.115 Generally, the facility and each vessel involved should have a person-in-charge during an oil transfer, unless the COTP determines that there is no increased risk of pollution in single-operator transfers involving more than one vessel. In determining whether to grant a request for a single-operator transfer, the COTP should consider the following:

a. At the facility in question, and under specified or controlled conditions, can one person effectively perform all required operations?

b. How complex is the operation? What degree of mechanization is available to assist the operator?

c. Can one person-in-charge operate the emergency shutdown for each transfer and respond to spills adequately?

d. What has been the past performance of the facility?

Mooring two adjacent barges manifold-to-manifold may be an acceptable arrangement for a single-operator transfer, mooring them end-to-end, which places the manifolds a considerable distance apart, may be unacceptable (see paragraph 31.C.17 above). Such requests should not be referred to Commandant (G-M) as exemption requests under 33 CFR 156.110.

4. Requirements for Oil Transfer

General

a. General. Vessel and facility owner/operators are responsible for the actions or inactions of their employees, and to train personnel and ensure their compliance with safety and environmental standards. Because personnel error is a predominant cause of oil spills, training and personnel compliance are essential to any pollution prevention program. (33 CFR 156.120)

Vessel Moorings

b. Vessel Moorings (33CFR156.120(a)). The intent is for mooring lines to be regularly checked throughout the transfer operation, to prevent the parting of hoses that could lead to an oil spill. If the person-in-charge of a vessel or facility is not satisfied with the intended operation at the pretransfer conference, the transfer shall not proceed until such time as the process is clearly understood and accepted. In crew or watch changes during cargo transfers, the oncoming crewmember should ensure that all provisions of the DOI are being met; when he or she signs the form, he or she becomes the person-in-charge. (33 CFR 156.120(a))

Fixed and Portable Transfer Systems 33 CFR 156.120(g)

c. Fixed and Portable Transfer Systems (33CFR156.120(g). This regulation supersedes the provisions of 46 CFR 35.35-20(d), which allows loading of Grade D and E cargoes through an open hatch. Due to static electricity combustion hazards produced by free-falling Grade D and E cargoes, and the health hazard from fumes posed to personnel in the cargo hold above the "deep tank," loose hose transfers over hatch tops are not permitted. The term "fixed connection" should be interpreted to mean the fixed cargo piping system installed on the vessel. In cases where the fixed cargo piping system does not exist, or where it is impossible or undesirable to use this system, the COTP should consider granting an alternative under 33 CFR 156.107 to allow use of a "portable transfer system." This system should consist of the following:

(1) Hose that meets the requirements of 33 CFR 154.500, or portable piping that meets the requirements of 46 CFR 56.

(2) Connections that meet the requirements of 33 CFR 156.130.

(3) A closure, such as a manhole cover, Butterworth plate, or flange, or deepwell pump stack, that forms a vaportight seal over the opening in the tank top through which the cargo is transferred. This closure should be bolted or dogged in place, and the hose and drop line should be connected to it.

NOTE: The alternative of a portable transfer system should be restricted to transfers of Grade D and E cargoes. However, approval has previously been given by Commandant (G-MSE) to certain parcel chemical tankers for transfer of cargo by this method. Continued acceptance should be considered for such vessels.

(4) A metallic drop line that meets the requirements of 46 CFR 153.282 (not necessary for transferring Grade E, edible vegetable or animal oils).

(5) A drip pan of at least 1/2-barrel capacity under each connection on the weather deck or ashore.

(6) A shutoff valve at or near the point of entry into the tank.

Securing of Certain Discharge and Sea Suction Valves 33 CFR 156.120(h)

d. Securing of Certain Discharge and Sea Suction Valves (33 CFR 156.120(h)). This regulation prohibits simultaneous cargo transfer and ballasting or deballasting of cargo tanks, except for specific circumstances set forth in 33 CFR 157 that are consistent with MARPOL 73/78. These are:

(1) Ballasting or deballasting of segregated ballast tanks (SBT's) because the pump and piping system are separate from the cargo system;

(2) Ballasting or deballasting of dedicated clean ballast tanks (CBT's), in accordance with 33 CFR 157 or where an independent ballast system for CBT's is installed; and

(3) Simultaneous ballasting and cargo discharge, in accordance with 33 CFR 157, to prevent hydrocarbon vapor emissions on a tank vessel with a crude oil washing (COW) system. The intent is to prevent accidental mixing of ballast water and cargo oil, or loss of oily mixtures to the water.

e. Hose Requirements (33 CFR 156.120(j)). If the first fabric layer (the "breaker" layer) is loosely woven and primarily intended to aid in bonding the cover to the rest of the hose, it is not considered a reinforcement layer. Hose repairs are allowed, provided the reinforcement is not penetrated, there are no leaks, and the repaired hose meets the testing requirements in 33 CFR 156.170.

f. Emergency Shutdown Mechanism (33 CFR 156.120(r)). This paragraph is meant to ensure that the equipment is operable. Triggering the device is not always necessary to do this.

g. Duties of Personnel (33 CFR 156.120(t) and (u)). 33 CFR 156.120(t)(1) has been modified to make it clear that the person-in-charge must be able to supervise all personnel during transfer operations. "At the site" means that the transfer point is in view, and that the person-in-charge is in a position to supervise the overall transfer operation and to respond to emergencies immediately. The requirements in 33 CFR 156.120(t) and (u) are not redundant. 33 CFR 156.120(t) applies to the person-in-charge; 33 CFR 156.120(u) requires all personnel on duty to comply with transfer guidelines. However, if a person-in-charge is engaged in a single-operator transfer, he or she must comply with the requirements of both 33 CFR 156.120(t) and (u). In making crew or watch changes, oncoming crewmembers shall ensure that all provisions of the DOI are being met. By signing the declaration, the oncoming person-in-charge assumes responsibility for the transfer from that point on.

h. Communications (33 CFR 156.120(v)). This paragraph does not require persons-in-charge to speak English, but it does require these persons to be able to speak to each other directly or through an interpreter who is continually present (this assumes that each, in turn, can communicate with his subordinates).

5. Discharge Cleanup

The intent of this section is to control the spread of oil and to check its source before resuming transfer operations. COTP authorization is required for resumption of normal transfer operations, not for the removal of discharged oil from the water and its return to proper storage. As long as removal by the spiller is performed properly, the COTP will not interfere in the cleanup operations. There should, of course, be no spills or leaks in the work area during transfer operations. A leak into containment devices is not considered a discharge into the water; stopping a leak without halting the transfer may be sufficient. However, the specified containment capacity must be available throughout the transfer operation. (33 CFR 156.125)

6. Declaration of Inspection (DOI)

33 CFR 156.150(f) requires operators of vessels and facilities to keep a copy of the DOI aboard for 1 month. When vessels (particularly unmanned barges) operate in a relatively limited area and conduct many transfers per month, so that unreasonably large numbers of DOI's would accumulate, the COTP may permit the vessel operator to keep only the DOI from the last transfer aboard. In most cases, the COTP will be concerned only with the most recent transfer that may have caused a spill. If more information is required, the facility copy of the DOI is available for 1 month (in all but vessel-to-vessel transfers). Should a problem arise with a particular vessel, the COTP should monitor the vessel's operations directly, rather than rely upon the DOI, to verify routine compliance. The requirements of 46 CFR 35.35-30 will be revised to ensure compatibility with the DOI requirements of 33 CFR 156.150. The ship/shore safety checklist from the International Oil Tanker and Terminal Safety Guide, sufficiently expanded to include the requirements of these regulations, is acceptable. (33 CFR 156.150)

7. Supervision By Person-In-Charge

If the person-in-charge must use a shelter during transfer operations in bad weather, the shelter must allow proper observation and supervision of the transfer and unimpeded operation of the emergency shutdown mechanism. (33 CFR 156.160)

8. Equipment Tests and Inspections

Introduction

a. Introduction. The high pressure test is intended to expose a weakness or leak under controlled conditions, so that corrective action can be taken before a spill. Testing to 1.5 MAWP is standard engineering practice and does not damage or destroy a hose in good working condition. On the other hand, testing only to MAWP is not a conclusive indicator of hose condition and is not suitable to determine that a hose is safe for transfer operations. Hose, piping, and loading arms covered by this regulation are not subject to the testing required under 33 CFR 126.15(o). (33 CFR 156.170)

Transfer Piping Systems

b. Transfer Piping Systems.

(1) A vessel's "oil transfer pipe system" includes the discharge pump and piping or hose between the pump and the vessel's deck manifold (which connects to the facility or other vessel's transfer system). The portions of the vessel's oil transfer pipe system, not including nonmetallic hose(s), must be tested annually to a minimum of 1.5 times the NAWP of the pipe system. In this instance, the MAWP can be assumed to be either the pressure at which the transfer piping relief valve is set or, where no relief valve(s) are fitted, the maximum discharge pressure including hydraulic shock that can be developed by the vessel's pump. For centrifugal pumps this is the pressure developed by the pump at zero flow conditions, i.e., pump "shutoff head." All nonmetallic cargo hose(s) used on a vessel as part of its oil transfer system must also be tested to 1.5 times its MAWP, which will be a minimum of 1,552 kPa per 33 CFR 155.800 and 156.170(c)(1).

(2) The test pressure for facility transfer piping and loading arm(s) under 33 CFR 156.170(c)(4) is 1.5 times the MAWP. This test pressure may be less than 1,552 kPa if the facility operator can demonstrate to the COTP's satisfaction by written procedures in their operations manual that an operating pressure or relief valve setting of less than 1,034 kPa is used by the facility. The hose that runs between the facility's manifold and the vessel's deck manifold is separate and distinct from the facility "oil transfer pipe system" and must be tested to 1.5 times the hose's MAWP but not less than 1,552 kPa. This figure represents 1.5 times a MAWP of at least 1,034 kPa, required for facility oil hose assemblies under 33 CFR 154.500. A facility "oil transfer system" extends from the last valve inside the containment required by the EPA (See 40 CFR 112.) through the transfer pipe to the loading arm or manifold.

Acceptance of Alternative Cargo Piping Test Pressures for Vessels

c. Acceptance of Alternative Cargo Piping Test Pressures for Vessels. Achieving test pressures of 150% MAWP for annual cargo piping tests on tank vessels is often impractical while vessels are in service, where transfers are conducted by vacuum or suction method, or outside the shipyard where special equipment is not available. Therefore, as provided by 33 CFR 156.107, alternative test pressures of not less than 100% MAWP may be used for in-service annual cargo piping tests, provided that a 150% MAWP test of the cargo piping is conducted at least twice in any five year period. It is envisioned that the 150% MAWP tests will be conducted during drydock periods at the discretion of the vessel owners or operators. Those vessels with longer drydock intervals must make arrangements to conduct the 150% MAWP tests at least twice in any five year period. All alternatives must provide an equivalent level of safety and protection from pollution. Accurate records of the required tests must be maintained aboard the vessel. These records shall be made available to the OCMI or COTP upon request. An alternative to the 150% MAWP test of hoses should not normally be granted. Sections of piping that cannot be tested without pressurizing cargo tanks, shall not be pressure tested due to the possibility of causing structural damage aboard the vessel. These sections of piping shall be visually examined during periods of availability.

F. MARINE SANITATION DEVICE (MSD) REGULATIONS

1. Authority

The EPA issued regulations on 29 January 1976 to revise federal standards for MSDs. These regulations, 40 CFR 140, apply to all vessels aboard which toilet facilities have been installed.

> **NOTE:** They do not require installation of MSDs aboard vessels that have no toilets at all.

Under the authority of Section 312 of the FWPCA (33 U.S.C. 1322), the Coast Guard issued regulations to implement the EPA's standards on 12 April 1976. These regulations, 33 CFR 159, establish operating procedures and design and construction requirements for all MSDs, and apply to all vessel owners and manufacturers and manufacturers of MSDs.

2. Definition

The term "marine sanitation device" includes any equipment for installation aboard a vessel that is designed to receive, retain, treat, or discharge sewage; it does not include "portable devices" (i.e., those that can be carried on and off the vessel). 33 CFR 159 became effective on 30 January 1977 for "new" vessels, and on 30 January 1980 for "existing" vessels (see 33 CFR 159.3 for definitions).

3. State Requirements

Vessels complying with 33 CFR 159 are not subject to state or local MSD requirements. However, a state may prohibit discharge of all sewage from vessels within any or all of its waters by obtaining an EPA determination that adequate shoreside facilities for the safe removal and treatment of sewage are reasonably available for such waters in which the prohibition would apply. In such waters, vessels must secure all flow-through MSDs to prevent any discharge into the water.

4. Certification of MSDs

General Procedures

a. General Procedures. All MSDs must be certified by the Coast Guard. If the device was built before 30 January 1976, it is considered an "existing" device. MSDs in this category (except no-discharge devices built before 30 January 1975) were certified by an official letter from the Commandant. No-discharge devices built after 30 January 1975 were certified by 33 CFR 159.12(b) without need for a letter; however, some manufacturers requested and received a letter in the certification process. Currently, if the device was manufactured on or after 30 January 1976 and is Coast Guard certified, it will have a label to this effect (except for certain no-discharge devices).

Labeling

b. Labeling. No-discharge devices used solely for the storage of sewage and flushwater at ambient pressure and temperature may be certified by definition (see 33 CFR 159.12(a)). Devices certified in this manner cannot be automatically labeled by the manufacturer; however, upon Coast Guard certification of the devices, labels identifying them as such may be attached. Such labels give the certification number and indicate whether the devices have been type-approved for inspected or uninspected vessels (See MSM II-C2 concerning inspection of MSDs).

CHAPTER 7: MARINE FACILITIES AND STRUCTURES

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A. AUTHORITIES

1. Magnuson Act, 50 U.S.C. 191

This statute authorizes the safeguarding of U.S. harbors, ports, waters, vessels and waterfront facilities and all territory and water, continental or insular, subject to the jurisdiction of the U.S., whenever the security of the United States is endangered.

2. Ports and Waterways Safety Act (PWSA) Of 1972, 33 U.S.C. 1221-1232(a)

This statute promotes safety and the environmental quality of ports, harbors, waterfront areas, and navigable waters of the United States (including the District of Columbia, Puerto Rico, the Panama Canal Zone, Guam, American Samoa, the Virgin Islands, and the Trust Territory of the Pacific Islands). The Secretary of Transportation has been given broad authority to take action to prevent damage to, or the destruction or loss of, any vessel, bridge, or other structure on or in U.S. navigable waters, or any land structure or shore area immediately adjacent to those waters; and to protect the navigable waters and resources therein from environmental harm resulting from vessel or structural damage, destruction, or loss. A 1986 amendment added 33 U.S.C. 1226 which provided the Secretary authority to "carry out or require measures, including inspections, port and harbor patrols, the establishment of security and safety zones, and the development of contingency plans and procedures, to prevent or respond to acts of terrorism."

3. Section 311 of the Federal Water Pollution Control Act (FWPCA), 33 U.S.C. 1321

This section 311 prohibits discharges of oil or hazardous substances, in quantities that may be harmful, into or upon the navigable waters of the U.S. and adjoining shorelines; into or upon the waters of the contiguous zone; in waters connected with activities subject to the Outer Continental Shelf Lands Act (OCSLA) or the Deepwater Port Act (DPA) of 1974; or so as to affect natural resources belonging to, appertaining to, or under the exclusive authority of the U.S., including resources under the Fishery Conservation and Management Act of 1976. The FWPCA directed the President to determine those quantities of oil and hazardous substances that, when discharged, may be harmful to the public health, welfare or environment of the United States. He was authorized to delegate the administration of the act to those federal departments and agencies that he determined to be appropriate. The President delegated these functions by Executive Order (E.O.) 12777, dated 18 October 1991.

4. Outer Continental Shelf Lands Act (OCSLA), 43 U.S.C. 1331-1356

This statute, as amended, provides, in part, that the Secretary of Transportation may promulgate and enforce reasonable regulations with respect to lights and other warning devices, safety equipment, and other matters relating to the promotion of safety of life and property on the artificial islands and structures located on the Outer Continental Shelf (OCS) or in adjacent waters. The Secretary of the Department of Transportation (SECDOT) has delegated this authority to the Commandant, who promulgated the safety regulations now contained in 33 CFR 140-147 (see volume II, chapter 24 of this manual).

5. Hazardous Materials Transportation Act (HMTA), 49 App. U.S.C. 1801-1819

Originally promulgated in 1975 this act was significantly changed by a 1990 amendment. It authorizes the Secretary of Transportation to inspect shipments of hazardous materials to ensure their safe movement in domestic and international transportation. This act and the regulations in 49 CFR published under it apply to packaged cargoes (including tank trucks and rail cars) on waterfront facilities, but not to the facility itself. This act is also the statutory authority for the regulations in 46 CFR Part 148 which govern the transportation of bulk solid hazardous materials.

6. E.O. 10173, as amended by E.O.'s 10277, 10352, and 11249

These orders, issued pursuant to the Magnuson Act, 50 U.S.C. 191, prescribed certain port security regulations (33 CFR 6) to be enforced by the Coast Guard. The Commandant was further authorized to issue supplemental regulations to carry out this program. These orders provide authority to prevent both intentional and accidental loss or destruction of vessels or waterfront facilities. In the past, these orders have been used for the prevention of accidental losses (port safety), however their primary intent is the prevention of intentional losses (port security).

7. E.O. 12777

This order delegated to the Secretary of the Department in which the Coast Guard operates, authority under the FWPCA for "the establishment of procedures, methods, and equipment and other requirements for equipment to prevent discharges of oil and hazardous substances from vessels and transportation related onshore and offshore facilities, and to contain such discharges." The regulations for marine oil and hazardous material transfer facilities and oil and hazardous material transfer operations (33 CFR 154-156) are promulgated, in part, under this authority. The Administrator of the Environmental Protection Agency (EPA) is charged with determining those quantities of oil and hazardous substances that may be harmful and those that are not.

8. Regulations

a. 33 CFR 6.12. These regulations authorize the COTP to supervise and control the transportation, handling, loading, discharging, stowage, or storage of hazardous materials on board vessels under certain conditions. The Commandant is authorized to designate waterfront facilities for the handling, storage, and loading and discharging of explosives, flammable or combustible liquids in bulk, and other dangerous articles. Authority to require permits for such handling, storage, loading, and unloading is also provided. Under 33 CFR 6.14, the Commandant is authorized to prescribe conditions and restrictions relating to the safety of waterfront facilities and vessels in port, as he deems necessary.

b. 33 CFR 126. To implement 33 CFR 6.12 and 6.14, the Commandant prescribed the supplemental regulations contained in 33 CFR 126 (Handling of Explosives or Other Dangerous Cargoes Within or Contiguous to Waterfront Facilities). These regulations designate types of waterfront facilities, permit requirements, and conditions that must be met and maintained by facilities involved in the handling, storage, loading, or discharging of explosives, blasting agents, oxidizers, radioactive materials, certain liquefied gases in bulk, or other dangerous articles. Although these regulations initially were issued under the Magnuson Act, they were reissued in 1977 under authority of the PWSA. Thus, the civil and criminal penalties of the PWSA now apply to these facility regulations. [NOTE: Commandant (G-MPS) has started a regulatory project to update these regulations.]

c. 33 CFR 127. These regulations apply to all waterfront facilities that transfer liquefied natural gas (LNG), in bulk, to or from vessels. They were issued in 1988 under authority of the PWSA. They specify standards for facility design, construction, equipment, operations, maintenance, training, firefighting, and security.

NOTE: Commandant (G-MPS) has started a regulatory project to revise these regulations to include other liquefied gases.

d. 33 CFR Parts 154 And 156. These regulations apply to all onshore and offshore facilities capable of transferring oil or liquid hazardous material, in bulk, to or from any vessel with a capacity of 250 or more barrels (about 40 cubic meters) on the navigable waters or contiguous zone of the United States (see volume IX of this manual (Being developed)).

e. Additional Regulations. There are various references to waterfront facilities in Titles 46 and 49 of the Code of Federal Regulations (CFR). The regulations under 49 CFR parts 171-179 were promulgated under the authority of the Hazardous Materials Transportation Act (HMTA).

B. DEFINITIONS

1. Waterfront Facility

The definition of what constitutes a facility varies depending upon the authorizing legislation and regulations. In general, a waterfront facility is a pier, wharf, dock or similar structure to which a vessel may be secured. Any equipment on the structure, any buildings on or contiguous to the structure, and any equipment or materials on the structure or in those buildings are also considered part of the facility. Structures, buildings, and equipment used in conjunction with pier equipment, but not within the areas described above, do not come within the meaning of a waterfront facility. For example, storage tanks located beyond the immediate area of a pier facility, which are separate and distinct units connected to the pier facility only by pipeline, are not considered parts of the facility. On the other hand, tanks located on a wharf are considered part of the facility, and jurisdiction applies to them. Specific limitations by authorizing legislation are as follows:

a. Magnuson Act, 50 U.S.C. 191. A waterfront facility includes any pier, wharf, dock or similar structure to which vessels may be secured. Areas of land or water in immediate proximity to such structures, equipment on the structure, and buildings on or contiguous to the structure are also considered part of the facility.

b. Ports and Waterways Safety Act, 33 U.S.C. 1221-1232(a). Although not specifically defined in either the act or in regulations, a waterfront facility includes any structure located in, on, or adjacent to the navigable waters of the U.S. and any land structure adjacent to the navigable waters of the U.S. Areas of land or water in immediate proximity to these structures (piers and wharves), buildings on or contiguous to these structures, and any equipment or materials (including vehicles) on or in these buildings or structures, are also considered part of the facility.

c. Federal Water Pollution Control Act, 33 U.S.C. 1321. A waterfront facility includes any "onshore facility" or "offshore facility" as defined in the act. An "onshore facility" is any facility (including, but not limited to, motor vehicles and rolling stock) of any kind located in, on, or under any land within the United States other than submerged land. An "offshore facility" is any facility of any kind located in, on, or under any of the navigable waters of the United States and any facility of any kind which is subject to the jurisdiction of the United States and is located in, on, or under any other waters, other than a vessel or a public vessel. This is a much broader authority than provided by the above acts. Coast Guard jurisdiction is limited primarily by agreement with the Environmental Protection Agency. The jurisdiction in that agreement is explained in volume IX of this manual (Being developed).

2. Bulk

A material that is transported on board a vessel without mark or count and which is directly loaded into a hold or tank on a vessel without containers or wrappers.

3. Contiguous

As used in 33 CFR 126, means those buildings that connect with or adjoin piers, wharves, docks, and similar structures, including those buildings that connect directly with other buildings situated in whole or in part upon such structures are considered to be contiguous. A building that is located entirely off the structure of a pier or wharf and has no direct contact with it is not a contiguous building and is not part of the facility.

4. Vessels and Non-Facility Equipment

The definition of a waterfront facility under the Magnuson Act and the PWSA does not include vessels, railways, cranes, working areas, roadways, entrance and operating areas, stock and cargo piles, storage areas, container fields, parking lots, fueling areas, storage tanks, and handling areas, unless they are located upon the structure of the pier or wharf, or within a building upon or contiguous to the structure. Hence, a vessel temporarily moored to a waterfront facility does not become part of the facility.

5. Designated Waterfront Facility

A facility regulated under 33 CFR 126 that handles dangerous cargoes subject to 46 CFR part 148 or 49 CFR parts 171-179, or a bulk cargo listed in 33 CFR 126.10(d), is considered a designated waterfront facility. Under the provisions of 33 CFR 126.13 these cargoes can be handled, stored, stowed, loaded, discharged, or transported only at designated waterfront facilities and the facility must meet the requirements in 33 CFR 126.15. Bulk liquid waterfront facilities (other than certain liquefied gas facilities) are not covered under 33 CFR 126 and therefore are not "Designated Waterfront Facilities." The definition of a designated waterfront facility under 33 CFR 126 is limited to those handling commodities subject to specific regulations. If a facility handles any materials that require it to be a designated waterfront facility under 33 CFR 126, it must store all hazardous materials in accordance with 33 CFR 126.15(m), even if the packages and/or quantities are exempted under 49 CFR 171-179.

6. Facility of Particular Hazard

A designated waterfront facility (regulated under 33 CFR 126) that handles a cargo listed in 33 CFR 126.10. A facility of particular hazard must meet all the conditions in 33 CFR 126.15, plus the additional requirements in 33 CFR 126.16.

C. TYPES OF WATERFRONT FACILITIES

In general, waterfront facilities are regulated and inspected according to the types of hazardous products they transfer to or from vessels. Facilities that transfer products in more than one category will be inspected for compliance with each applicable set of regulations. In general, facilities are fixed structures, however in some cases tank trucks and rail cars can be considered "mobile" facilities (see 33 CFR 154.105). Under the PWSA, vehicles are not facilities, however when a vehicle capable of transferring a liquefied gas drives onto a fixed structure, it becomes part of the equipment on the structure converting it into a liquefied gas transfer facility. Vessels inspected under the regulations in CFR Title 46 are never considered facilities, however a permanently moored vessel that is not inspected under Title 46 may be considered part of a facility. Publicly owned or operated facilities are included in the definition of facility, however facilities owned and operated by federal agencies generally are not inspected by the COTP. The four general categories of waterfront facilities are: bulk liquefied gas, dry bulk, packaged, and bulk liquid. LNG facilities and LHG facilities are bulk liquefied gas facilities. Bulk liquid facilities, outer continental shelf facilities, and deepwater ports are covered elsewhere in this manual.

1. Bulk Liquefied Natural Gas Waterfront Facilities

a. Definition. A bulk liquefied natural gas waterfront facility is any pier, wharf, dock or similar structure to which a vessel may be secured that is used, or is capable of being used, to transfer liquefied natural gas (LNG) to or from a vessel, in bulk. The facility also includes areas of land, water, or land and water under and in immediate proximity to the structure, buildings on or contiguous to the structure, and equipment and materials on the structure or in the buildings. This term does not include facilities directly operated by the Department of Defense.

b. Jurisdiction. The bulk LNG facility requirements primarily apply to active facilities, however some of the safety requirements may apply to facilities in caretaker status. These rules are issued under the PWSA and therefore only apply to structures that are located in, on, or under the navigable waters of the U.S. (out to five kilometers). A tank truck or rail car that transfers liquefied gas from a structure converts that structure into a LNG facility. The owner of the structure or area of land and the operator of the tank truck or rail car are jointly responsible for ensuring that the requirements are met if a LNG transfer takes place. Jurisdiction on LNG facilities is generally limited by regulation to the "marine transfer area." The marine transfer area on LNG facilities extends from the waterfront or manifold to the last valve prior to the receiving tank.

c. Applicable Regulations. Facilities handling LNG in bulk are regulated under 33 CFR 127. The MARPOL reception facility regulations in 33 CFR 158 may also apply to a LNG facility.

2. Bulk Liquefied Hazardous Gas Waterfront Facilities

a. Definition. A bulk liquefied hazardous gas waterfront facility is any pier, wharf, dock or similar structure to which a vessel may be secured that is used, or is capable of being used, to transfer a liquefied hazardous gas (LHG) to or from a vessel, in bulk. The facility also includes areas of land, water, or land and water under and in immediate proximity to the structure, buildings on or contiguous to the structure, and equipment and materials on the structure or in the buildings. This term does not include facilities directly operated by the Department of Defense. Liquefied hazardous gases are those products listed in 33 CFR 126.10(d).

b. Jurisdiction. The bulk LHG facility requirements primarily apply to active facilities, however some of the safety requirements may apply to facilities in caretaker status. These rules are issued under the PWSA and therefore only apply to structures that are located in, on, or under the navigable waters (out to five kilometers) of the U.S. A tank truck or rail car that transfers LHG from a structure converts that structure into a LHG facility. The owner of the structure and the operator of the tank truck or rail car are jointly responsible for ensuring that the requirements are met if a LHG transfer takes place. Jurisdiction on LHG facilities is generally limited to the "marine transfer area." The marine transfer area on LHG facilities currently extends from the waterfront or manifold to the first valve inland from the manifold, including the entire pier or wharf on which the transfer manifold is located.

c. Applicable Regulations. Facilities handling LHG in bulk are regulated under 33 CFR 126. The MARPOL reception facility regulations in 33 CFR 158 may also apply to a LHG facility.

3. Dry Bulk Waterfront Facilities

a. Definition. A dry bulk waterfront facility is any pier, wharf, dock or similar structure to which a vessel may be secured that is used, or is capable of being used, to transfer solid hazardous materials, to or from a vessel, in bulk. The facility also includes areas of land, water, or land and water under and in immediate proximity to the structure, buildings on or contiguous to the structure, and equipment and materials on the structure or in the buildings. This term does not include facilities directly operated by the Department of Defense. Bulk solid hazardous materials are any materials, other than liquids or gases, listed in the 49 CFR 172.101 table and its appendix when shipped in bulk. Bulk solid hazardous materials that may be transported on vessels without prior approval from the Commandant are listed in 46 CFR 148.01.

b. Jurisdiction. These rules are issued under the PWSA and therefore only apply to structures that are located in, on, or under the navigable waters (out to five kilometers) of the U.S. When a truck or rail car transfers solid hazardous materials to or from a vessel, it and the structure on which it is located, are to be considered a waterfront facility covered under these rules. Jurisdiction on dry bulk facilities includes the entire pier or wharf from which a transfer takes place, all buildings on or contiguous to such structures, and any equipment or materials on the structures or in the buildings.

c. Applicable Regulations. Facilities handling solid hazardous materials in bulk are regulated under 33 CFR 126. The MARPOL reception facility regulations in 33 CFR 158 may also apply to a dry bulk waterfront facility.

4. Packaged Hazardous Material Waterfront Facilities

a. Definition. A packaged hazardous material waterfront facility is any pier, wharf, dock or similar structure to which a vessel may be secured that is used, or is capable of being used, to transfer packaged hazardous materials, to or from a vessel. The facility also includes areas of land, water, or land and water under and in immediate proximity to the structure, buildings on or contiguous to the structure, and equipment and materials on the structure or in the buildings. This term does not include facilities directly operated by the Department of Defense. Packaged hazardous materials are those materials covered under 49 CFR parts 171-179 when carried in packages that meet the requirements of those parts, including materials shipped in transport vehicles (tank trucks, rail cars, etc.) and freight containers.

b. Jurisdiction. These rules are issued under the PWSA and therefore only apply to structures that are located in, on, or under the navigable waters (out to five kilometers) of the U.S. When a truck or rail car transfers packaged hazardous materials to or from a vessel, it and the structure on which it is located, are a waterfront facility covered under these rules. Jurisdiction on packaged hazardous material facilities includes the entire pier or wharf from which a transfer takes place, all buildings on or contiguous to such structures, and any equipment or materials on the structures or in the buildings.

NOTE: These limits to jurisdiction over the waterfront facility do not apply to inspections of packaged hazardous materials consigned for shipment by water under the Hazardous Materials Transportation Act (49 U.S.C. 1801-1819), for which jurisdiction is not limited to waterfront facilities.

c. Applicable Regulations. Facilities handling packaged hazardous materials are regulated under 33 CFR 126. Packaged hazardous materials must meet the requirements in 49 CFR parts 171-179. The MARPOL reception facility regulations in 33 CFR 158 may also apply to a packaged hazardous material waterfront facility.

5. Bulk Liquid Waterfront Facilities

➔ See MSM Volume IX (Being developed).

6. Outer Continental Shelf Facilities

Inspections of these facilities will be conducted by the Officer in Charge, Marine Inspection (OCMI) in accordance with 33 CFR 142 and 43 U.S.C. 1348(c). Guidance on the scope of such inspections and the reporting of deficiencies is contained in volume II, chapter 24 of this manual.

7. Deepwater Ports

➔ See MSM VI, Chapter 2.

8. Mixed Use Waterfront Facilities

Some waterfront facilities fit into more than one facility type. For instance a facility may handle both oil and liquefied gases in bulk. In most cases there is a distinct separation between the portions of the facility that handles these different categories of product and each portion can be treated as a separate facility. In some cases the same area is used for different categories of product and that area must meet the requirements for more than one facility type. If the requirements conflict, the COTP should apply the requirements that provide the highest level of safety.

D. TYPES OF WATERFRONT FACILITY VISITS

1. Inspections

An inspection is a formal visit to a waterfront facility to ensure its safe operation and to verify compliance with applicable safety, security, and pollution prevention regulations. The applicable regulations for each type of facility are listed in paragraph B of this chapter. The frequency of inspection will be established by the COTP. Before the inspection visit, inspecting personnel should review the facility file for previous instances of noncompliance, outstanding deficiencies, hot work permits, and any alternatives, exemptions, or waivers granted. The latest facility's operations manual should also be reviewed. Consider contacting cognizant state and local authorities (local fire department, state department of environmental protection, etc.) to see if they want to conduct a joint inspection. Joint inspections promote interagency cooperation and reduce the inspection burden on the facility operator. After arriving at the facility, the inspection team should be accompanied by a facility representative and must record each discrepancy observed, including those corrected immediately. A report of the inspection, discrepancies found, and actions taken to correct those discrepancies shall be entered into the Marine Safety Information System in accordance with volume I, chapter 12 of this manual. The Waterfront Facility Inspection form (CG-4200) may be used as a guide for inspectors, however for most facility inspections the CG-4200 must be supplemented with a locally prepared checklist until an updated form is developed and distributed. A copy of the facility inspection report must be provided to the facility owner or operator.

2. Surveys

A facility survey is a detailed account of a facility's physical plant and equipment used to update Coast Guard files. Updated information must be entered into the following MSIS facility file supplements as applicable: FFID, FFPS, FFIP, FFFF, FFPF, FFMR, FFMS, and FFSD. Diagrams, photographs, manuals, permits, and similar information that cannot be stored in the MSIS facility file must be maintained by the COTP in a facility file that it is readily available for use when responding to an emergency at the facility. Each waterfront facility must be surveyed every two years. The survey should be combined with an inspection into a single facility visit. Use the Port Security Checklist as a guide in collecting physical security information during the survey. Physical security surveys must also be conducted at passenger ship terminals and category I and II Key Asset Protection Program facilities which are not inspected waterfront facilities. For further information on facility surveys see volume VI, chapter 1 and volume VII, chapter 2 of this manual. Special guidance on bulk liquid waterfront facility surveys is contained in volume IX of this manual (Being developed).

3. Transfer Monitors

When monitoring transfer operations between a vessel and facility, COTP personnel should monitor facility operations during the transfer as well as vessel operations. The facility portion of the visit should be recorded in MSIS as a facility transfer monitor.

4. Waste Reception Facility Inspections

Each waterfront facility that is used by oceangoing tank vessels or other oceangoing vessels of more than 400 gross tons must provide MARPOL waste reception facilities (33 CFR 158). For coastal ports, most waterfront facilities must have waste reception facilities for oil and garbage even if no hazardous materials are transferred to or from the facility. Guidelines for conducting waste reception facility inspections are contained in volume IX of this manual (Being developed). Waste reception facility inspections may be conducted during the same visit when other inspections are conducted.

5. Other Visits

Spot checks of waterfront facilities are not required. In addition to the above visits, it may be necessary to visit a waterfront facility for: container inspections, investigations, inspection discrepancy follow-ups, operations manual reviews, document and certificate checks, firefighting equipment checks, pollution prevention/ compliance checks, hot work permit checks, and pollution response plan drills. If possible, these visits should be conducted in conjunction with vessel boardings at the facility. Every visit to a waterfront facility must be documented in MSIS.

E. BULK LIQUEFIED NATURAL GAS WATERFRONT FACILITY INSPECTIONS

1. Applicable Regulations

Liquefied natural gas waterfront facilities are regulated separately from waterfront facilities handling other bulk liquid hazardous materials. Only Liquefied Natural Gas (LNG) facilities are regulated under 33 CFR 127. There is no capacity threshold for these facilities and the requirements apply equally to fuel and cargo. The LNG facility requirements apply only if the product is transferred or stored as a liquid at the facility. The regulations in 33 CFR 154 and 156 do not apply to LNG facilities. There are no separate regulations for mobile LNG facilities, however any pier, wharf, or area of land from which a mobile facility transfers LNG must meet the fixed facility requirements or obtain an alternative from the COTP.

2. Letter of Intent and Manuals

Each owner who intends to build a new waterfront facility to handle LNG in bulk, or plans new construction on an existing LNG facility, must notify the COTP of their intent. A letter of intent must be sent to the COTP at least 60 days before construction begins (33 CFR 127.007). If a facility becomes inactive, the owner or operator must submit a new letter of intent at least 60 days before it transfers LNG again. An LNG facility is considered active unless the facility owner or operator notifies the COTP that no LNG transfer operations are planned for the next 12 months. The COTP must review the letter of intent and construction plans. A letter of recommendation based on this review must be sent to the originator of the letter of intent and to the federal and local authorities having jurisdiction. The COTP should seek public comments before making a recommendation and, for new LNG facilities, should consider public hearings or meetings. If any of the information in the letter of intent changes, the owner or operator must notify the COTP within 15 days. At least 30 days before transferring LNG, the facility owner or operator must submit two copies of the operations manual and two copies of the emergency manual to the COTP for review. If the operations manual meets 33 CFR 127.305 and the emergency manual meets 33 CFR 127.307, the COTP should mark the manuals with the words "Examined by the Coast Guard" and return one copy of each manual to the sender. One copy of each examined manual must be retained with the facility file at the COTP office. If a manual does not meet the regulatory requirements, the COTP should either require changes or approve an acceptable alternative. During inspections, ensure that the operations and emergency manuals have been examined by the COTP and maintained up to date. During monitors, ensure that the operations manual is readily accessible to the facility person in charge and that the transfer procedures in the operations manual are followed.

3. Fire Safety The purpose of fire safety is to prevent fires and explosions on waterfront facilities. It also ensures that the resources necessary to respond to a fire are available and in working order should a fire occur. On bulk liquefied natural gas waterfront facilities the threat of fire extends not only from the flammable products but to their vapors as well. Vapor plumes from an LNG spill can travel a significant distance from the spilled liquid. The following fire safety requirements apply to bulk liquefied gas facilities:

a. Smoking Prohibitions. Under 33 CFR 127.615 smoking is prohibited in the marine transfer area of an LNG waterfront facility when there is LNG present. For practical purposes this means no smoking on an active facility. During LNG facility inspections and monitors, if you see someone smoking, make sure they are in an area where smoking is authorized. Also note anyone smoking on a vessel moored to the facility since smoking is prohibited on the weather decks of tank vessels moored alongside a dock under 46 CFR 35.30-5(d).

b. Hot Work. Hot work is any welding, burning, cutting, or similar operation that generates heat or sparks that could ignite a flammable material. A permit from the COTP is required for such operations on LNG waterfront facilities under 33 CFR 127.617. (See volume VI, section 1.H.5 of this manual.)

(1) General. The intent of this requirement is to prohibit indiscriminate hot work that could cause a fire or explosion by providing the COTP with authority to regulate such an operation. In some cases, local or unusual conditions may make some of these requirements unnecessary or not feasible. In these instances, the COTP may use the alternative authority provided by 33 CFR 127.017. In other cases, local or unusual conditions may make these requirements inadequate and additional conditions should be added to the permit. Any additional conditions specified by the COTP should be based upon sound safety standards such as NFPA or ANSI standards. The prime consideration in evaluating hot work permit requests must be safety. If the degree of safety is questionable, a permit should not be issued. Liaison with local fire authorities is encouraged when evaluating unusual permit requests. Permits may be issued for a single day, the duration of a single project, or for a longer period (up to one year) that will cover a number of projects, at the discretion of the COTP.

(2) References. NFPA has published the following standards for hot work: "Welding and Cutting," NFPA 51; "Welding Processes," NFPA 51B; and "Control of Gas Hazards on Vessels to be Repaired," NFPA 306. Hot work on a vessel moored to an LNG waterfront facility must be covered under a permit issued to the facility under 33 CFR 127.617.

(3) Enforcement. The hot work permit requirements should be enforced to the maximum extent possible. Where practical, hot work permit enforcement may be performed by local fire departments. However, COTP personnel must occasionally verify that the conditions on the permit are being followed, particularly on facilities that have a history of safety violations. If hot work is in progress during a facility inspection or monitor verify that the facility (or a vessel moored to the facility) has a permit for the hot work and that the conditions of the permit are being met.

c. Motor Vehicles on the Pier. Under 33 CFR 127.311 motor vehicles (cars and trucks) may only stop or park in designated parking spaces on an LNG facility. Motor vehicles may not be refueled on an LNG facility.

d. Electrical Installations. Under 33 CFR 127.105, electrical power systems (which include electrical wiring and equipment) on LNG facilities must conform to the National Electric Code (NFPA 70). LNG facilities must also have an emergency power source for the emergency shutdown system, communications equipment, firefighting equipment, and emergency lighting. During inspections and monitors, look for the following electrical hazards:

(1) Conditions which could cause arcing;

(2) Electric motors that are:

(a) Located too near combustible material;

(b) Located in damp place or subjected to corrosive vapors;

(c) Covered with rust, lint or dust;

(d) Burning out because of overloading or low voltage at motor terminals;

(e) Protected by improper overcurrent protection; or

(f) Producing excessive heat.

(3) Bare wires;

(4) Loose or frayed connections;

(5) Overloaded outlets;

(6) Corroded terminals;

(7) Lack of high voltage signs near transformers and switch boxes; and

(8) Defective insulation.

e. Open Fires. Open fires in lamps, barrels, drums, or similar apparatus are prohibited. These requirements should be strictly enforced within the marine transfer area when a pipe or tank contains LNG or its vapors (see 33 CFR 127.615).

f. Maintenance Stores and Supplies. Under 33 CFR 127.313, materials that may be stored in bulk on LNG facilities are limited to: LNG, Liquefied Petroleum Gas (LPG), vessel fuel, and oily waste from vessels. Other flammable products, such as solvents, lubricants, paints, and fuels, may be stored on LNG facilities only in amounts that could reasonably be used in one day. These flammable products must be stored in accordance with chapter 4 of NFPA 30. During inspections look for containers of flammable liquids or other hazardous materials left on the pier or wharf. Make sure containers in storage compartments are not leaking or left open so that vapors accumulate in the storage compartment.

g. Fire Extinguishing Equipment. Fire extinguishing and protection equipment is essential to the safe operation of any waterfront facility. The requirements for firefighting equipment on LNG facilities are provided in 33 CFR parts 127.601 through 127.611. They describe the required fire main systems, dry chemical systems, and portable fire extinguishers. The facility must have at least one international shore connection. Once installed, fire extinguishing and protection equipment must be maintained in good condition at all times (33 CFR 127.405). Under 33 CFR 127.601(b) fire appliances such as hydrants, standpipes, fire extinguishers, hose stations, and fire monitors must be red or some other conspicuous color and must be in locations that are readily accessible. During inspections, look for improperly marked fire appliances, material blocking access to fire appliances, and appliances that are not functional (excessive corrosion, missing fire hoses, etc.). Also make sure that the international shore connection is available.

h. Warning Signs. Warning signs must be displayed on each LNG waterfront facility at the point of transfer. The intent of this requirement is to warn persons and vessels approaching the facility of the hazardous nature of the operation. They must be visible from both the shore and the water. These signs must conform to the requirements in 33 CFR 127.113. Vessels carrying LNG in bulk are also required to display warning signs that meet the requirements in 46 CFR 154.1830.

4. Transfer Operations

a. Person-In-Charge (PIC). At all times during the transfer of a liquefied gas to or from a vessel, the transfer system in use must be under the supervision of a qualified "person in charge" [33 CFR 127.319(a)]. On an LNG facility, a person in charge must be trained and certified in accordance with 33 CFR 127.301 to be qualified. The training must include at least 48 hours of LNG transfer experience. Each person in charge must know: the hazards of the cargo being transferred, the regulations that apply to the operation, and the facility's operating and emergency procedures. Written certification of the training must be maintained at the facility. The person assigned as person in charge on the facility shall not be assigned as person in charge of the vessel's transfer operation or to any other duties that may prevent him from carrying out his duties as person in charge on the facility.

b. Communications. Communications between the person in charge on the facility and the person in charge aboard the vessel are vital to the safe transfer of LNG in bulk. The person in charge shoreside shall maintain communications in accordance with the requirements in 33 CFR 127.319(b)(1) and 33 CFR 127.111. During monitors, make sure that the person in charge has an effective means of communication. If there is some doubt as to the effectiveness of communications, require a communications check.

c. Transfer Connections. Connections between transfer hoses or loading arms and fixed piping must be secured with sufficient bolts and suitable gasket material to prevent leakage. The connections must allow for vessel movement within the limits of its moorings without placing strain on the transfer piping or loading arm. Specific requirements are contained in 33 CFR 127.315. During monitors, check transfer connections for the number of bolts used. Carefully check questionable connections for leaks. A portable combustible gas indicator can be used to check for natural gas leaks.

d. Preliminary Transfer Inspection. Before commencing a cargo transfer, the facility person in charge must ensure that the conditions for transfer have been met. This includes verifying that the hot work, warning sign, and transfer connection requirements have been met, as well as verifying that the person in charge aboard the vessel is ready to begin the transfer. On LNG facilities the items listed in 33 CFR 127.315 must be checked and a Declaration of Inspection (DOI) completed jointly with the vessel person in charge as required under 33 CFR 127.317. During monitors, ensure that the DOI is properly completed and signed.

5. Transfer System Testing Requirements

a. Transfer Hoses and Piping. On LNG facilities, each transfer hose, loading arm, and cargo transfer pipe must be hydrostatically tested at least once each year and each time major alterations are made to the system (see 33 CFR 127.407(a)). Each cargo transfer hose and pipe shall be subjected to at least 1.1 times its maximum allowable working pressure for at least 30 minutes during the test (see 33 CFR 127.407(b)). Bulk LNG hoses and piping must not be tested with LNG, but may be tested with non-hazardous liquids other than water. Where hydrostatic testing is impractical, the COTP may authorize pneumatic testing of cargo hoses and piping with the condition that the precautions in 46 CFR 56.97-35 are followed during testing. Before granting alternatives or waivers for hydrostatic tests, the COTP must consider the following factors:

(1) Length of transfer system under evaluation;

(2) Access to transfer system (buried, elevated, insulated, etc.);

(3) The presence of any relief valves in the system and their routine maintenance schedule;

(4) The age of the system;

(5) The history of the system (e.g., what commodities the system has been used for, major alterations made); and

(6) The date of the last hydrostatic test.

b. Other Transfer System Equipment. Other transfer system equipment must be periodically checked or tested to ensure proper operation and maintenance. The set pressure on each relief valve must be tested or the relief valve must be visually inspected during the annual piping test (see 33 CFR 127.403 and 127.407). The date and results of these tests and inspections must be recorded and maintained at the facility. During annual inspections, check facility records to verify that these tests and inspections have been recorded.

6. Occupational Safety The Coast Guard and the Occupational Safety and Health Administration (OSHA) share responsibility for the safety of workers on waterfront facilities handling hazardous materials. The Coast Guard's primary responsibility in this area is the safe handling of hazardous materials. As liquid bulk facilities, LNG facilities are not covered by the OSHA marine terminal regulations in 29 CFR 1917. Instead, these facilities are covered by the general OSHA workplace regulations in 29 CFR 1910.

a. Lighting. Waterfront facilities must be adequately illuminated when handling hazardous materials during periods of darkness to prevent accidents. Adequate lighting is required under 33 CFR 127.109. The light level must be at least 55 lux at each transfer point and at least 11 lux in other parts of the transfer area. Measurements of light intensity should, if possible, be made with a light meter. Lights should be installed over aisles and in other locations where they will not be damaged by cargo handling equipment or vehicles. Light fixtures should be protected by wire guards unless mounted out of the normal reach of equipment and personnel. Open flame lights and lanterns using kerosene or gasoline are prohibited. When monitoring a transfer after dark, ensure that the work area lighting meets the regulatory requirements.

b. Cargo Information. Information on the cargo being transferred or stored at a facility is necessary to: contain and clean up cargo spills, safely extinguish cargo fires, and treat persons exposed to the cargo. Under 33 CFR 127.307 each LNG facility must have an emergency manual that contains information on emergency response, firefighting, and first aid procedures for LNG.

c. Warning Alarms. Warning alarms are intended to alert approaching vessels and the local community in the event of an LNG release. Each LNG facility must have both a siren and a rotating (or flashing) amber light meeting the specifications in 33 CFR 127.207. The adequacy of these warning alarms should be verified during the annual facility inspection. On LNG facilities, the light intensity and sound decibels should be verified from placards affixed to the equipment or equipment manuals. If appropriate placards and manuals are not available, compliance should be verified in the same manner as for LHG facilities.

7. Security

a. Guards. The security requirements in 33 CFR 127.701-127.711 do not specifically require guards, however they do require access control and security patrols which usually require guards. Trained guards are required in sufficient numbers to provide surveillance of the waterfront facility to: deter unlawful entry, deter vandalism, detect fire hazards, detect discharges of hazardous materials, and check the readiness of protective equipment. Guards should be thoroughly instructed in the operation of fire alarm boxes, fire hoses, portable fire extinguishers, and similar fire equipment. They should know the location of telephones and emergency equipment, emergency fire protection measures, and emergency notification procedures. The National Fire Protection Association (NFPA) has developed two standards applicable to guards that may be used in determining the adequacy of guards: Guard Service - NFPA 601, and Guard Operations - NFPA 601A. When determining whether the number of guards provided are adequate for a facility, the COTP should consider the security barriers and detection devices in place.

b. Guard Requirement Alternatives. Under 33 CFR 127.017, the COTP may approve alternatives to guards on LNG facilities where the stationing of guards is impractical. Alternatives for guard requirements should only be considered for small transfer facilities that are not manned between transfer operations and do not store bulk liquid hazardous materials on site, which is generally not applicable to LNG facilities. Such a facility may be secured by fencing and monitored by intrusion detection devices, cameras, or random patrols rather than permanent guards. When reviewing requests for alternatives to the guard requirements, the COTP must consider the security barriers and detection devices in place, the likelihood of intrusion, the proximity of population centers, and the danger presented by any tanks or piping containing hazardous materials.

c. Security Barriers. Fences, walls, and similar barriers act as a deterrent to unauthorized entry onto waterfront facilities handling or storing hazardous materials. Buildings, water bodies, ravines, and similar barriers may also be used to deter entry but may need to be augmented by safeguards such as fences, walls, patrols, surveillance cameras, or intrusion detection devices. Under 33 CFR 127.709, impounding spaces, control stations, and electrical power sources on LNG facilities must be within a fence or wall. Security barriers should be considered when determining the appropriate number of guards on the facility.

8. Records

LNG facilities must keep and make available to the COTP, certain records under 33 CFR sections 127.409 and 126.15(o). Records must be maintained of: alternatives approved by the COTP, equipment tests, and Declarations of Inspection. The official Coast Guard record for facility information is the MSIS facility file. A paper file shall be maintained by the COTP for each facility in the zone for any facility information that cannot be maintained in MSIS, including: a copy of the operations manual, a copy of the emergency manual, a copy of the work sheet or check list used during inspections, facility plans or diagrams, and similar information.

9. Relationship with Other Federal Agencies

Within the Department of Transportation (DOT), the Coast Guard and the Research and Special Programs Administration (RSPA) exercise overlapping authorities to regulate the location, design, construction, maintenance, and operation of LNG facilities adjoining U.S. navigable waters. Recognizing the overlap in agency responsibilities, the Commandant and the Administrator of RSPA signed a memorandum of understanding (MOU), in May 1986, to avoid duplication of regulatory efforts and to maximize the exchange of information (see volume X of this manual). Further information on this agreement can be obtained from Commandant (G-MPS).

F. BULK LIQUEFIED HAZARDOUS GAS WATERFRONT FACILITY INSPECTIONS

1. Applicable Regulations

Liquefied hazardous gas waterfront facilities are regulated separately from waterfront facilities handling LNG and other bulk liquid hazardous materials. Liquefied hazardous gases are those products listed in 33 CFR 126.10(d). LHG facilities must comply with the requirements under 33 CFR 126. There is no capacity threshold for LHG facility requirements. These requirements apply only if the product is transferred or stored as a liquid cargo at the facility. The regulations in 33 CFR 154 and 156 do not apply to LHG facilities. There are no separate regulations for mobile LHG facilities, however any pier, wharf, or area of land from which a mobile facility transfers LHG must meet the fixed facility requirements or obtain a waiver from the COTP.

2. General Permit

No letter of intent or operations manual is required for LHG facilities. Instead, each facility is automatically issued a general permit to handle, store, stow, load, discharge, or transport LHG under 33 CFR 126.27. If an individual decides to operate such a facility, no notice to the Coast Guard is required. Each COTP must be alert for changes in LHG operations within their COTP zone. Each LHG facility must meet certain conditions in 33 CFR parts 126.15 and 126.27. If a facility fails to meet those conditions the COTP may terminate or suspend the general permit to handle LHG. (See volume VI, section 1.H.1 of this manual.)

3. Fire Safety

The purpose of fire safety is to prevent fires and explosions on waterfront facilities. It also ensures that the resources necessary to respond to a fire are available and in working order should a fire occur. On bulk LHG waterfront facilities the threat of fire extends not only from the flammable products but to their vapors as well. Vapor plumes from a flammable liquefied gas spill can travel a significant distance from the spilled liquid. The following fire safety requirements apply to bulk liquefied gas facilities:

Smoking Prohibitions

a. Smoking Prohibitions. Under 33 CFR 126.15(b) smoking is prohibited on an LHG waterfront facility except where designated by the owner or operator of the facility. Smoking may only be permitted on LHG facilities in accordance with local ordinances and regulations. Where there are no local ordinances, the COTP should ensure that all locations classified as hazardous in NFPA 70 (generally within 15 meters of where flammable hazardous materials are stored) are posted as no smoking areas. Smoking restrictions generally do not apply if the LHG handled is not flammable. Questionable cases should be discussed with local authorities. Signs must be conspicuously posted indicating those areas where smoking is authorized and those areas where smoking is prohibited. It is not enough for the facility owner or operator to post signs, the restrictions must also be enforced. During LHG facility inspections and monitors look for "no smoking" signs near piping and tanks for flammable products. If you see someone smoking, make sure they are in an area where smoking is authorized. Also note anyone smoking on a vessel moored to the facility since smoking is prohibited on the weather decks of tank vessels moored alongside a dock under 46 CFR 35.30-5(d).

Hot Work

b. Hot Work. Hot work is any welding, burning, cutting, or similar operation that generates heat or sparks that could ignite a flammable material. Prior approval of the COTP is required for such operations on LHG waterfront facilities under 33 CFR 126.15(c). A hot work permit is the preferred means for giving COTP approval for hot work operations. (See volume VI, section 1.H.5 of this manual.)

(1) General. The intent of this requirement is to prohibit indiscriminate hot work that could cause a fire or explosion by providing the COTP with authority to regulate such an operation. In some cases, local or unusual conditions may make some of these requirements unnecessary or not feasible. In these instances, the COTP may use the waiver authority provided by 33 CFR 126.11. In other cases, local or unusual conditions may make these requirements inadequate and additional conditions should be added to the permit. Any additional conditions specified by the COTP should be based upon sound safety standards such as NFPA or ANSI standards. The prime consideration in evaluating hot work permit requests must be safety. If the degree of safety is questionable, a permit should not be issued. Liaison with local fire authorities is encouraged when evaluating unusual permit requests. Permits may be issued for a single day, the duration of a single project, or for a longer period (up to one year) that will cover a number of projects, at the discretion of the COTP.

(2) References. NFPA has published the following standards for hot work: "Welding and Cutting," NFPA 51; "Welding Processes," NFPA 51B; and "Control of Gas Hazards on Vessels to be Repaired," NFPA 306. Hot work on a vessel moored to an LHG facility must be covered under a permit issued to the facility under 33 CFR part 126.15(c).

(3) Enforcement. The hot work permit requirements should be enforced to the maximum extent possible. Where practical, hot work permit enforcement may be performed by local fire departments. However, COTP personnel must occasionally verify that the conditions on the permit are being followed, particularly on facilities that have a history of safety violations. If hot work is in progress during a facility inspection or monitor verify that the facility (or a vessel moored to the facility) has a permit for the hot work and that the conditions of the permit are being met.

Motor Vehicles on the Pier

c. Motor Vehicles on the Pier. Under 33 CFR 126.15(d), unattended motor vehicles may only remain on an LHG facility when parked in parking spaces designated by the facility owner or operator in conformance with local ordinances and regulations. If a vehicle is waiting to load or discharge cargo, equipment, supplies, or passengers it must be attended by a driver. The COTP may waive this requirement if the vehicle does not block the flow of traffic and the vehicle engine is stopped. The number of vehicles permitted on the pier or wharf at one time should be limited to permit free traffic flow. Filling vehicle fuel tanks while on the LHG facility, is prohibited under 33 CFR 126.15(e).

Equipment on the Pier Driven by Internal Combustion Engines

d. Equipment on the Pier Driven by Internal Combustion Engines. Additional safety requirements for LHG facilities are provided under 33 CFR 126.15(e) for equipment driven by an internal combustion engine that is regularly used on the waterfront facility. Such equipment includes fork lifts, generators, and pumps, as well as motor vehicles. The equipment must be kept free from excessive oil, grease, and lint so as not to constitute a fire hazard. Each piece of equipment must carry an approved fire extinguisher unless the equipment is operating in an area where extinguishers are available on the facility, and the COTP has approved the arrangement. Equipment that is not attached to the pier or wharf should not be stored or fueled on the pier or wharf. Such equipment should be stored or fueled in designated areas away from the pier or wharf.

Rubbish and Waste Materials

e. Rubbish and Waste Materials. The requirements in 33 CFR 126.15(f) address the fire hazards created by poor housekeeping on LHG facilities. Fire safety inspections should not be limited to obvious areas, but should include out-of-the-way places as well. Both the insides and outsides of sheds and other buildings should be examined. Hazards and potential hazards that could cause a fire to start or hinder firefighters should be noted and corrected. Inspectors should be alert to:

(1) Piles of dunnage or scrap;

(2) Rubbish or waste materials on piers or wharves;

(3) Sloppy carpenter and paint shops, etc.;

(4) Railroad cars laden with waste materials;

(5) Inadequate or unsuitable waste cans (rubbish should be kept in metal containers with covers, and removed or emptied at frequent intervals to prevent dangerous accumulations); and

(6) Hazardous accumulations of dust on trusses, girders, or other structural members.

Electrical Installations

f. Electrical Installations. Under 33 CFR 126.15(h) installations of electrical wiring and equipment on LHG facilities made after 28 August 1951 must be in accordance with accepted safe practices. Conformance to the National Electric Code and to local ordinances and regulations is considered to meet the safe practices requirement. Electrical equipment, fittings, and other devices must be approved for use by the Underwriters Laboratories, Inc. (UL), the Associated Factory Mutual Laboratories (FM), or the Canadian Standards Association (CSA). National Bureau of Standards (NBS) approval is also acceptable under 33 CFR 126.15(h), however NBS no longer issues such approvals. All electrical wiring and equipment, including that installed prior to 28 August 1951, must be maintained in a safe condition without defects or modifications that could cause a fire or personal injury. Defective or dangerous wiring, equipment, and devices must be replaced, removed or permanently disconnected. During inspections and monitors, look for the following electrical hazards:

(1) Conditions which could cause arcing;

(2) Electric motors that are:

(a) Located too near combustible material;

(b) Located in damp place or subjected to corrosive vapors;

(c) Covered with rust, lint or dust;

(d) Burning out because of overloading or low voltage at motor terminals;

(e) Protected by improper overcurrent protection; or

(f) Producing excessive heat.

(3) Bare wires;

(4) Loose or frayed connections;

(5) Overloaded outlets;

(6) Corroded terminals;

(7) Lack of high voltage signs near transformers and switch boxes; and

(8) Defective insulation.

Heating Methods

g. Heating Methods. Under 33 CFR 126.15(i) heating equipment on LHG facilities must be safely installed and maintained in good operating condition. The recommended guide for safe installation of heating equipment is the National Board of Fire Underwriters Building Code. For portable electric heating equipment, approval by CSA, FM, or UL should be used as a guide for safe design, and NFPA 70 should be used as a guide for safe installation. Adequate clearances must be provided for heating equipment to prevent undue heating of nearby combustible materials. In addition, 33 CFR 126.15(i) requires that spark arresters be provided if the heater uses solid fuel. Open fires in lamps, barrels, drums, or similar apparatus are prohibited. These requirements should be strictly enforced, particularly in areas within 30 meters of a pipe or tank containing flammable products. During inspections look for improper heaters in sheds or shelters on the facility.

h. Maintenance Stores and Supplies. Under 33 CFR 126.15(g) supplies that are regulated as "hazardous materials" under 49 CFR parts 171 through 179 may be kept on LHG facilities only in amounts necessary to meet normal operating requirements. These materials must be stored in appropriate storage compartments (paint lockers, etc.). During inspections look for containers of flammable liquids or other hazardous materials left on the pier or wharf. Make sure containers in storage compartments are not leaking or left open so that vapors accumulate in the storage compartment.

Fire Extinguishing Equipment

i. Fire Extinguishing Equipment. Fire extinguishing and protection equipment is essential to the safe operation of any waterfront facility. The quantity, type, and location of equipment required for LHG facilities will vary depending upon the products handled and the hazards they present. Under 33 CFR 126.15(j) fire extinguishing equipment must be available on each LHG facility in adequate quantities, locations, and types. The COTP should work with the local fire authority in determining the adequacy of fire equipment. NFPA 307 and NFPA 10 may be used as guides when determining adequacy of that equipment. If the fire equipment on an LHG facility is inadequate, the COTP must notify the facility operator of the problem in writing and provide the operator an opportunity to correct the situation. Once installed, fire extinguishing and protection equipment must be maintained in good condition at all times. Under 33 CFR 126.15(k) fire appliances such as hydrants, standpipes, fire extinguishers, hose stations, and fire alarm boxes must be conspicuously marked and readily accessible. The color used in marking depends upon local regulations but, generally, they are marked in red and their purpose or number shown in white lettering. The markings must be placed high enough that they will not be hidden by cargo, stanchions, columns, risers, or other obstructions. All locations of fire appliances should be numbered and indicated on the facility's floor plan. During inspections, look for improperly marked fire appliances, material blocking
access to fire appliances, and appliances that are not functional (excessive corrosion, missing fire hoses, etc.).

Warning Signs

j. Warning Signs. Warning signs must be displayed on each LHG waterfront facility at the point of transfer. The intent of this requirement is to warn vessels approaching the facility of the hazardous nature of the operation. They must face parallel to and perpendicular to the shoreline. They must be visible from vessels on the waterway at all times during the transfer. On LHG facilities, these signs must conform to the requirements in either 46 CFR 151.45-2(e)(1) or 46 CFR 153.955. Vessels carrying LHG in bulk are also required to display warning signs that meet the requirements in 46 CFR 35.30-1, 151.45-2, or 153.955 as applicable.

4. Transfer Operations

a. Person-In-Charge (PIC). When transferring LHG to or from a vessel, the transfer system in use must be under the continuous control and surveillance of a qualified "person in charge." To be qualified, the person in charge must be trained, and the training documented, in accordance with 33 CFR 126.15(o)(1). Evidence of training for persons in charge on LHG facilities must be provided to the COTP prior to the transfer. The person assigned as person in charge on the facility shall not be assigned as person in charge of the vessel's transfer operation or to any other duties that may prevent him from carrying out his duties as person in charge on the facility. The COTP may authorize a single person to be the person in charge on both the facility and the vessel if the proposed operations provide adequately for the safety of the vessel and the facility. However, such authorizations should not be routinely authorized for LHG transfers due to the complexity of transfer operations and the hazardous nature of the cargo.

b. Communications. Communications between the person in charge on the facility and the person in charge aboard the vessel are vital to the safe transfer of bulk liquefied gases. The person in charge shoreside shall maintain communications in accordance with 33 CFR 126.15(o)(3). During monitors, make sure that the person in charge has an appropriate means of communication. If there is some doubt as to the effectiveness of communications, require a communications check.

c. Transfer Connections. Connections between transfer hoses or loading arms and fixed piping must be secured with sufficient bolts and suitable gasket material to prevent leakage. The connections must allow for vessel movement within the limits of its moorings without placing strain on the transfer piping or loading arm. Specific requirements are contained in 33 CFR 126.15(o)(2). During monitors, check transfer connections for the number of bolts used. Carefully check questionable connections for leaks. A portable combustible gas indicator can be used to check for flammable gas leaks.

d. Preliminary Transfer Inspection. Before commencing a cargo transfer, the facility person in charge must ensure that the conditions for transfer have been met. This includes verifying that the hot work, warning sign, and transfer connection requirements have been met, as well as verifying that the person in charge aboard the vessel is ready to begin the transfer. When applicable, a copy of the vessel's DOI required under 46 CFR 35.35-30 should be obtained and, to the extent possible, the vessel's condition verified to be as stated on the DOI. During monitors, ensure that the vessel's DOI is properly completed and signed.

5. Transfer System Testing Requirements

a. Transfer Hoses and Piping. Each transfer hose, loading arm, and cargo transfer pipe must be hydrostatically tested at least once each year. On LHG facilities, each cargo transfer hose and pipe shall be subjected to at least 1.5 times its maximum allowable working pressure during the test (see 33 CFR 126.15(o)(7)(v)). LHG hoses and piping should not be tested with hazardous products, but may be tested with non-hazardous liquids other than water. Where hydrostatic testing is impractical, the COTP may authorize pneumatic testing of cargo hoses and piping with the condition that the precautions in 46 CFR 56.97-35 are followed during testing. Before granting alternatives or waivers for hydrostatic tests, the COTP must consider the following factors:

(1) Length of transfer system under evaluation;

(2) Access to transfer system (buried, elevated, insulated, etc.);

(3) The presence of any relief valves in the system and their routine maintenance schedule;

(4) The age of the system;

(5) The history of the system (e.g., what commodities the system has been used for, major alterations made); and

(6) The date of the last hydrostatic test.

b. Other Transfer System Equipment. Other transfer system equipment must be periodically checked or tested to ensure proper operation and maintenance. On LHG waterfront facilities, each cargo pump system and relief valve must be tested at least once each year. Each cargo pump pressure gauge must be calibrated at least once each year (see 33 CFR 126.15(o)(7)). The date and results of these tests and inspections must be recorded and maintained at the facility. During annual inspections, check facility records to verify that these tests and inspections have been recorded.

6. Occupational Safety The Coast Guard and the Occupational Safety and Health Administration (OSHA) share responsibility for the safety of workers on waterfront facilities handling hazardous materials. The Coast Guard's primary responsibility in this area is the safe handling of hazardous materials. As liquid bulk facilities, LHG facilities are not covered by the OSHA marine terminal regulations in 29 CFR 1917. Instead, these facilities are covered by the general OSHA workplace regulations in 29 CFR 1910.

a. Lighting. Waterfront facilities must be adequately illuminated when handling hazardous materials during periods of darkness to prevent accidents. On LHG facilities no lighting intensity is specified, however if it does not approximate the LNG facility requirements of at least 55 lux at each transfer point and at least 11 lux in other parts of the transfer area, the lighting should be considered inadequate. If the lighting on an LHG facility is inadequate, the COTP must notify the facility operator of the problem in writing and provide the operator an opportunity to correct the situation [33 CFR 126.15(n)]. Measurements of light intensity should, if possible, be made with a light meter. Lights should be installed over aisles and in other locations where they will not be damaged by cargo handling equipment or vehicles. Light fixtures should be protected by wire guards unless mounted out of the normal reach of equipment and personnel [33 CFR 126.15(n)]. Open flame lights and lanterns using kerosene or gasoline are prohibited [33 CFR 126.15(l)]. Temporary lighting, when required, must be obtained from battery powered flashlights or protected electric lamps that are energized from portable electric generators, located outside off the pier. When monitoring a transfer after dark, ensure that the work area lighting meets the regulatory requirements.

b. Cargo Information. Information on the cargo being transferred or stored at a facility is necessary to: contain and clean up cargo spills, safely extinguish cargo fires, and treat persons exposed to the cargo. Under 33 CFR 126.15(o)(2)(vii) the LHG facility person in charge must possess a cargo information card for each LHG handled. The cargo information card must include:

(1) The name of the cargo;

(2) The cargo's appearance, color, and odor;

(3) The hazards involved in handling the cargo;

(4) Any special handling procedures for the cargo;

(5) Procedures to follow if the cargo spills or leaks;

(6) Procedures for treating a person exposed to the cargo; and

(7) Firefighting procedures and extinguishing agents effective for combatting a cargo fire.

c. Warning Alarms. Warning alarms are intended to alert approaching vessels and the local community in the event of a liquefied gas release. Each LHG facility is considered a "facility of particular hazard" and must meet the requirement for a warning alarm in 33 CFR 126.16(b). The warning alarm may be either a rotating siren or a flashing light. The color of the rotating flashing light is not prescribed, however, amber is recommended because it is considered most effective in alerting personnel to a hazard. The adequacy of warning alarms should be verified during the annual facility inspection. The alarm should be activated while a member of the inspection team, located 1600 meters away, determines if it can be seen or heard. Inspectors should be particularly alert to obstructions that could prevent a warning light from being seen from the waterway.

7. Security

Guards

a. Guards. Trained guards are required in sufficient numbers to provide surveillance of the waterfront facility to: deter unlawful entry, deter vandalism, detect fire hazards, detect discharges of hazardous materials, and check the readiness of protective equipment. Guards should be thoroughly instructed in the operation of fire alarm boxes, fire hoses, portable fire extinguishers, and similar fire equipment. They should know the location of telephones and emergency equipment, emergency fire protection measures, and emergency notification procedures. The National Fire Protection Association (NFPA) has developed two standards applicable to guards that may be used in determining the adequacy of guards required under 33 CFR 126.15(a): Guard Service - NFPA 601, and Guard Operations - NFPA 601A. When determining whether the number of guards provided are adequate for a facility, the COTP should consider the security barriers and detection devices in place. If the guards for an LHG facility are found to be inadequate, the COTP must notify the facility operator of the problem in writing and provide the operator an opportunity to correct the situation.

Guard Requirement Waivers

b. Guard Requirement Waivers. Under 33 CFR 126.11, the COTP may waive the requirement for guards on LHG facilities where the stationing of guards is impractical or unnecessary. Waivers for guard requirements should only be considered for small transfer facilities that are not manned between transfer operations and do not store bulk liquid hazardous materials on site. Such a facility may be secured by fencing and monitored by intrusion detection devices, cameras, or random patrols rather than permanent guards. When reviewing requests for waiver from the guard requirements, the COTP must consider the security barriers and detection devices in place, the likelihood of intrusion, the proximity of population centers, and the danger presented by any tanks or piping containing hazardous materials.

Security Barriers

c. Security Barriers. Fences, walls, and similar barriers act as a deterrent to unauthorized entry onto waterfront facilities handling or storing hazardous materials. Buildings, water bodies, ravines, and similar barriers may also be used to deter entry but may need to be augmented by safeguards such as fences, walls, patrols, surveillance cameras, or intrusion detection devices. Security barriers are not specifically required on LHG facilities, but they should be considered when determining the appropriate number of guards under 33 CFR 126.15(a).

8. Records

LHG facilities must keep and make available to the COTP, certain records under 33 CFR 126.15(o). The facility must maintain records of waivers granted by the COTP and equipment tests. The official Coast Guard record for facility information is the MSIS facility file. A paper file shall be maintained by the COTP for each facility in the zone for any facility information that cannot be maintained in MSIS, including: a copy of the operations manual, a copy of the work sheet or check list used during inspections, facility plans or diagrams, and similar information.

G. PACKAGED AND DRY BULK WATERFRONT FACILITY INSPECTIONS

1. Applicable Regulations

Packaged and dry bulk waterfront facilities are regulated under 33 CFR 126. These regulations apply to any waterfront facility that handles, stores, stows, loads, discharges, or transports a packaged cargo regulated under 49 CFR parts 171-179 or a bulk cargo regulated under 46 CFR 148. The regulations in 49 CFR parts 171-179 also apply to facilities handling packaged hazardous materials.

2. Permit to Operate

a. General Permit. Under 33 CFR 126.27 a waterfront facility is automatically issued a general permit to handle, store, stow, load, discharge, or transport a packaged cargo regulated under 49 CFR parts 171-179 or a bulk cargo regulated under 46 CFR 148 (other than division 1.1 and 1.2 explosives). This general permit is issued on the condition that the requirements in 33 CFR 126.15 and 33 CFR 126.27 are met. If an individual decides to operate such a facility, no notice to the Coast Guard is required. If an operator fails to meet the requirements in 126.15 and 126.27, the COTP may terminate or suspend the general permit to handle dangerous cargo. (See volume VI, section 1.H.1 of this manual.)

b. Designated Dangerous Cargo Permit. Under 33 CFR 126.17 a waterfront facility may only handle, load, discharge, or transport division 1.1 and 1.2 explosives if the COTP issues a permit or waives the requirement for a permit. A permit is required for each transaction of handling, loading, discharging, or transporting a designated dangerous cargo and the conditions in 33 CFR 126.15 must be met. The permit automatically terminates at the conclusion of the transaction for which the permit was issued. The permit may be terminated or suspended by the COTP whenever he deems it necessary for safety or security reasons. (See volume VI, section 1.H.2 of this manual.)

3. Fire Safety

The purpose of fire safety is to prevent fires and explosions on waterfront facilities. It also ensures that the resources necessary to respond to a fire are available and in working order should a fire occur. On packaged and dry bulk waterfront facilities the threat of fire stems not only from flammable cargoes but from other flammable articles on the facility such as dunnage, building materials, and rubbish. The following fire safety requirements apply to packaged and dry bulk facilities:

Smoking Prohibitions

a. Smoking Prohibitions. 33 CFR 126.15(b) prohibits smoking on a waterfront facility except where designated by the owner or operator of the facility. Smoking may only be permitted on packaged and dry bulk facilities in accordance with local ordinances and regulations. Signs must be conspicuously posted. Where there are no local ordinances, the COTP should ensure that all locations classified as hazardous in NFPA 70 (generally within 15 meters of where flammable hazardous materials are stored) are posted as no smoking areas. Questionable cases should be discussed with local authorities. Under 49 CFR 176.182(f), smoking is prohibited on or near any vessel loading or unloading explosives at a waterfront facility, but may be allowed in designated smoking areas at a safe distance from the vessel. It is not enough for the facility owner or operator to post signs, the restrictions must also be enforced.

Hot Work

b. Hot Work. Hot work is any welding, burning, cutting, or similar operation that generates heat or sparks that could ignite a flammable material. Prior approval of the COTP is required for such operations under 33 CFR 126.15(c). A hot work permit is the preferred means for giving COTP approval for hot work operations. (See volume VI, section 1.H.5 of this manual.)

(1) General. The intent of this requirement is to prohibit indiscriminate hot work that could cause a fire or explosion by providing the COTP with authority to regulate such an operation. In some cases, local or unusual conditions may make some of these requirements unnecessary or not feasible. In these instances, the COTP may use the waiver authority provided by 33 CFR 126.11. In other cases, local or unusual conditions may make these requirements inadequate and additional conditions should be added to the permit. Any additional conditions specified by the COTP should be based upon sound safety standards such as NFPA or ANSI standards. Welding is prohibited at facilities, or on vessels moored thereto, when explosives are present under 33 CFR 126.15(c). No reference is made to the different classes of explosives; therefore, this condition may be overly restrictive in some cases. In this situation the COTP may use the waiver authority under 33 CFR 126.11 to maintain an acceptable level of safety without prohibiting reasonable operations on waterfront

facilities. The prime consideration in evaluating hot work requests must be safety. If the degree of safety is questionable, a permit should not be issued. Liaison with local fire authorities is encouraged when evaluating unusual permit requests. Permits may be issued for a single day, the duration of a single project, or for a longer period (up to one year) that will cover a number of projects, at the discretion of the COTP.

(2) References. NFPA has published the following standards for hot work: "Welding and Cutting," NFPA 51; "Welding Processes," NFPA 51B; and "Control of Gas Hazards on Vessels to be Repaired," NFPA 306. Hot work permits for vessels carrying explosives or other packaged hazardous materials moored at a facility are issued to the vessel under 49 CFR 176.54. Hot work on other vessels moored to a packaged or dry bulk waterfront facility are issued to the facility under 33 CFR part 126.15(c).

(3) Enforcement. The hot work permit requirements should be enforced to the maximum extent possible. Where practical, hot work permit enforcement may be performed by local fire departments. However, COTP personnel must occasionally verify that the conditions on the permit are being followed, particularly on facilities that have a history of safety violations. If hot work is in progress during a facility inspection or monitor verify that the facility (or a vessel moored to the facility) has a permit for the hot work and that the conditions of the permit are being met.

Motor Vehicles on the Pier

c. Motor Vehicles on the Pier. Under 33 CFR 126.15(d) transient trucks and automobiles are allowed to remain on the waterfront facility only for a period of time long enough to load or unload cargo, equipment, supplies, or passengers. If a vehicle is waiting to load or unload, it must be attended by a driver. Vehicle parking on the waterfront facility is permitted only in spaces that are designated for parking and marked off by the facility owner or operator in accordance with local ordinances. The number of vehicles permitted upon the pier or wharf at one time should be limited to permit free traffic flow. Vehicle engines must be stopped when loading and unloading cargo. Filling or draining vehicle fuel tanks or making repairs, while on the waterfront facility, is prohibited.

Equipment on the Pier Driven by Internal Combustion Engines

d. Equipment on the Pier Driven by Internal Combustion Engines. Additional safety requirements are provided under 33 CFR 126.15(e) for equipment driven by an internal combustion engine that is regularly used on the waterfront facility. Such equipment includes fork lifts, generators, and pumps, as well as motor vehicles. The equipment must be kept free from excessive oil, grease, and lint so as not to constitute a fire hazard. Each piece of equipment must carry an approved fire extinguisher unless the equipment is operating in an area where other facility extinguishers are available on the facility, and the COTP has approved the arrangement. Equipment that is not attached to the pier or wharf should not be stored or fueled on the pier or wharf. Such equipment should be stored or fueled in designated areas away from the pier or wharf.

Rubbish and Waste Materials

e. Rubbish and Waste Materials. The requirements in 33 CFR 126.15(f) address the fire hazards created by poor housekeeping. Inspections for fire hazards should not be limited to obvious areas, but should include out-of-the-way places as well. Both the insides and outsides of sheds and other buildings should be examined. Hazards and potential hazards that could cause a fire to start or hinder firefighters should be noted and corrected. Inspectors should be alert to:

(1) Piles of dunnage or scrap;

(2) Rubbish or waste materials on piers or wharves;

(3) Sloppy carpenter and paint shops, etc.;

(4) Railroad cars laden with waste materials;

(5) Inadequate or unsuitable waste cans (rubbish should be kept in metal containers with covers, and removed or emptied at frequent intervals to prevent dangerous accumulations); and

(6) Hazardous accumulations of dust on trusses, girders, or other structural members.

Electrical Installations

f. Electrical Installations. Under 33 CFR 126.15(h) installations of electrical wiring and equipment on packaged and dry bulk facilities made after 28 August 1951 must be in accordance with accepted safe practices. Conformance to the National Electric Code and to local ordinances and regulations is considered to meet the safe practices requirement. Electrical equipment, fittings, and other devices must be approved for use by the Underwriters Laboratories, Inc. (UL), the Associated Factory Mutual Laboratories (FM), or the Canadian Standards Association (CSA). National Bureau of Standards (NBS) approval is also acceptable under 33 CFR 126.15(h), however NBS no longer issues such approvals. All electrical wiring and equipment, including that installed prior to 28 August 1951, must be maintained in a safe condition without defects or modifications that could cause a fire or personal injury. Defective or dangerous wiring, equipment, and devices must be replaced, removed or permanently disconnected. During inspections and monitors, look for the following the electrical hazards:

(1) Conditions which could cause arcing;

(2) Electric motors that are:

(a) Located too near combustible material;

(b) Located in damp place or subjected to corrosive vapors;

(c) Covered with rust, lint or dust;

(d) Burning out because of overloading or low voltage at motor terminals;

(e) Protected by improper overcurrent protection; or

(f) Producing excessive heat.

(3) Bare wires;

(4) Loose or frayed connections;

(5) Overloaded outlets;

(6) Corroded terminals;

(7) Lack of high voltage signs near transformers and switch boxes; and

(8) Defective insulation.

Heating Methods

g. Heating Methods. Under 33 CFR 126.15(i) heating equipment on packaged and dry bulk facilities must be safely installed and maintained in good operating condition. The recommended guide for safe installation of heating equipment is the National Board of Fire Underwriters Building Code. For portable electric heating equipment, approval by CSA, FM, or UL should be used as a guide for safe design, and NFPA 70 should be used as a guide for safe installation. Adequate clearances must be provided for heating equipment to prevent undue heating of nearby combustible materials. In addition, 33 CFR 126.15(i) requires that spark arresters be provided if the heater uses solid fuel. Open fires in lamps, barrels, drums, or similar apparatus are prohibited. These requirements should be strictly enforced, particularly in areas within 100 feet of a pipe or tank containing flammable products. During inspections look for improper heaters in sheds or shelters on the facility.

Maintenance Stores and Supplies

h. Maintenance Stores and Supplies. Under 33 CFR 126.15(g) supplies that are regulated as "hazardous materials" under 49 CFR parts 171 through 179 may be kept on designated waterfront facilities only in amounts necessary to meet normal operating requirements. These materials must not be stored on piers or wharves, but in compartments that are remote from combustible materials. The compartments must be designed to provide ready access and safe storage. During inspections, make sure containers in storage compartments are not leaking or left open so that vapors accumulate in the storage compartment. Also verify that scrap materials, rags, and other debris is not left in the storage compartment.

Fire Extinguishing Equipment

i. Fire Extinguishing Equipment. Fire extinguishing and protection equipment is essential to the safe operation of any waterfront facility. The quantity, type, and location of equipment required for each facility will vary depending upon the types of hazards present. Under 33 CFR 126.15(j) fire extinguishing equipment must be available on each packaged and dry bulk waterfront facility in adequate quantities, locations, and types. The COTP should work with the local fire authority in determining the adequacy of fire equipment. NFPA 307 and NFPA 10 may be used as guides when determining adequacy of that equipment. If the fire equipment on a facility is inadequate, the COTP must notify the facility operator of the problem in writing and provide the operator an opportunity to correct the situation. Once installed, fire extinguishing and protection equipment must be maintained in good condition at all times. Under 33 CFR 126.15(k) fire appliances such as hydrants, standpipes, fire extinguishers, hose stations, and fire alarm boxes must be conspicuously marked and readily accessible. The color used in marking depends upon local regulations but, generally, they are marked in red and their purpose or number shown in white lettering. The markings must be placed high enough that they will not be hidden by cargo, stanchions, columns, risers, or other obstructions. All locations of fire appliances should be numbered and indicated on the facility's floor

plan. During inspections, look for improperly marked fire appliances, material blocking access to fire appliances, and appliances that are not functional (excessive corrosion, missing fire hoses, etc.).

4. Arrangement of Cargoes and Materials

Cargoes at a waterfront facility must be stowed in an orderly arrangement to permit complete access for firefighting and reduce the risk of fire.

a. Clear Areas. Clear areas are required when stacking or arranging cargo or materials on the waterfront facility or in buildings on the waterfront facility. At least 60 centimeters of clearance must be provided around all stacks or piles of cargo, freight, merchandise, or other materials (33 CFR 126.15(m)(1)). The cleared area must be kept free of rubbish, dunnage, or other obstructions. Around firefighting equipment and fire alarm boxes the cleared area must be at least 1.2 meters with a straight aisle at least one meter wide leading to the center aisle (33 CFR 126.15(m)(3) and (4)). The main aisle must be at least 2.5 meters wide and at least six meters wide if fire truck access is required (33 CFR 126.15(m)(5)). Cross aisles, at least 1.5 meters wide, must be located at least every 23 meters along the facility or within the building (33 CFR 126.15(m)(6)).

b. Stacking. Under 33 CFR 126.15(m)(2), no cargoes, freight, merchandise, or materials may be stacked closer than 90 centimeters from the ceiling of a building or its structural members. Nor may they be stacked closer than 30 centimeters from sprinkler heads. Packaged cargoes, freight, merchandise, or materials that are flammable or combustible may not be tiered higher than 3.7 meters on the waterfront facility. This includes containers as well as pallets, boxes, paper, etc. This restriction is very broad in scope and was intended to protect older facilities constructed at least partially of wood. The COTP may waive this requirement, however the safety implications must be carefully considered. The following NFPA standards should be used as guidelines when considering waivers of cargo arrangement and storage requirements:

Standard Code	Title
NFPA 231	Indoor General Storage
NFPA 231A	Outdoor General Storage
NFPA 307	Operation of Marine Terminals
NFPA 490	Ammonium Nitrate

5. Occupational Safety

The Coast Guard and the Occupational Safety and Health Administration (OSHA) share responsibility for the safety of workers on waterfront facilities handling hazardous materials. The Coast Guard's primary responsibility in this area is the safe handling of hazardous materials. Packaged and dry bulk facilities are covered by the OSHA marine terminal regulations in 29 CFR 1917. Inspectors should be aware of these OSHA regulations because they may cover safety situations not covered by Coast Guard regulations. The following safety requirements apply to most waterfront facilities:

Lighting

a. Lighting. Waterfront facilities must be adequately illuminated when handling hazardous materials during periods of darkness to prevent accidents. Adequate lighting is required under 33 CFR 126.15(l), for packaged and dry bulk facilities. No lighting intensity is specified, however it should meet the OSHA requirements in 29 CFR 1917.123 which require lighting of at least 55 lux in each active work area, at least 11 lux in other work areas, and at least 5 lux for security purposes. Measurements of light intensity should, if possible, be made with a light meter. Lights should be installed over aisles and in other locations where they will not be damaged by vehicle movements or cargo handling. Light fixtures should be protected by wire guards unless mounted out of the normal reach of equipment and personnel. Open flame lights and lanterns using kerosene or gasoline are prohibited. Temporary lighting, when required, must be obtained from battery powered hand lamps or protected electric lamps that are energized from portable electric generators, located outside of the building or off the pier.

Cargo Handling Equipment

b. Cargo Handling Equipment. No specific Coast Guard requirements have been set for cargo handling equipment on packaged or dry bulk facilities, however OSHA has set the following requirements:

(1) Cargo slings must meet the requirements in 29 CFR 1917.13.

(2) Ropes, chains, blocks, and hooks must meet the requirements in 29 CFR 1917.42.

(3) Powered industrial trucks must meet the requirements in 29 CFR 1917.43.

(4) Conveyors must meet the requirements in 29 CFR 1917.48.

(5) Spouts, chutes, hoppers, bins and similar equipment must meet the requirements in 29 CFR 1917.49.

Warning Alarms

c. Warning Alarms. Packaged or dry bulk facilities that handle division 1.1 or 1.2 explosives, oxidizing material or blasting agents requiring a permit (primarily ammonium nitrates), or highway route controlled quantities of radioactive material, are considered facilities of particular hazard. These facilities are required to have warning alarms under 33 CFR 126.16(b). Warning alarms are intended to alert approaching vessels and the local community in the event of an imminent explosion or radioactive release. Each facility of particular hazard must have either a rotating siren or a flashing light that can be heard or seen at least one mile away. The color of the rotating flashing light is not prescribed, however, amber is recommended because it is considered most effective in alerting personnel to a hazard. The adequacy of warning alarms should be verified during the annual facility inspection by activating the alarm while a member of the inspection team, located 1600 meters away, determines if it can be seen or heard. Inspectors should be particularly alert to obstructions that could prevent a warning light from being seen from the waterway.

6. Security

Guards

a. Guards. Trained guards are required in sufficient numbers to provide surveillance of the waterfront facility to: deter unlawful entry, deter vandalism, detect fire hazards, detect discharges of hazardous materials, and check the readiness of protective equipment. Guards should be thoroughly instructed in the operation of fire alarm boxes, fire hoses, portable fire extinguishers, and similar fire equipment. They should know the location of telephones and emergency equipment, emergency fire protection measures, and emergency notification procedures. The National Fire Protection Association (NFPA) has developed two standards applicable to guards that may be used in determining the adequacy of guards required under 33 CFR 126.15(a): Guard Service - NFPA 601, and Guard Operations - NFPA 601A. When determining whether the number of guards provided are adequate for a facility, the COTP should consider the security barriers and detection devices in place. If the guards are found to be inadequate, the COTP must notify the facility operator of the problem in writing and provide the operator an opportunity to correct the situation.

Guard Requirement Waivers

b. Guard Requirement Waivers. Under 33 CFR 126.11, the COTP may waive the requirement for guards on packaged and dry bulk facilities where the stationing of guards is impractical or unnecessary. Waivers for guard requirements should only be considered for small transfer facilities that do not store large quantities of hazardous materials on site. Such a facility may be secured by fencing and monitored by intrusion detection devices, cameras, or random patrols rather than permanent guards. Before approving waivers from the guard requirements, the COTP must consider the security barriers and detection devices in place, the likelihood of intrusion, the proximity of population centers, and the danger presented by hazardous materials stored at the facility.

Security Barriers

c. Security Barriers. Fences, walls, and similar barriers act as a deterrent to unauthorized entry onto waterfront facilities handling or storing hazardous materials. Buildings, water bodies, ravines, and similar barriers may also be used to deter entry but may need to be augmented by safeguards such as fences, walls, patrols, surveillance cameras, or intrusion detection devices. Security barriers are not specifically required on waterfront facilities but they should be considered when determining the appropriate number of guards under 33 CFR 126.15(a).

7. Records

Packaged and dry bulk waterfront facilities are not required to maintain records for the Coast Guard, but should keep and make available to the Coast Guard inspectors reports from prior Coast Guard inspections of the facility. The official Coast Guard record for facility information is the MSIS facility file. A paper file shall be maintained by the COTP for each facility in the zone to maintain any facility information that cannot be maintained in MSIS, including: a copy of the work sheet or check list used during inspections, facility plans, photographs, diagrams, and similar information.

H. ENTRY ONTO PRIVATE PROPERTY

1. General

Entry into private property that is part of a shoreline adjoining U.S. waters may be necessary to undertake immediate response activities and subsequent investigations, and to perform inspections to ensure compliance with regulations. In Commandant (G-LMI) memo 5800 of 25 SEP 1972, the Chief Counsel of the Coast Guard determined that, in general: Coast Guard personnel have the authority to enter private property on or near navigable waters without a warrant to carry out discharge response activities, and related investigations or inspections; and may also conduct warrantless administrative inspections where the property is subject to regulation concerning pollution prevention and hazardous materials.

2. Access Authorized

Inspections should be conducted on a prearranged basis whenever practical, with a representative of the owner or operator accompanying the inspection team. Monitors should be conducted without advance notice while a transfer is in progress. Industry members have, historically, responded to the Coast Guard's needs by permitting inspection personnel almost unlimited access to their property. It is a rare occasion when a Coast Guard member is "turned away at the gate."

3. Access Denied

When this occurs, the COTP/OCMI must determine what actions are appropriate. Force shall not be used in non-emergency situations. If a search warrant is considered necessary, the district commander (dl) should be contacted for assistance. The COTP should point out to an owner who refuses entry to his or her property that:

a. A packaged, dry bulk, or liquefied hazardous gas facility's general permit may be revoked if an inspection is not completed. Without an inspection, there can be no verification that the facility or structure is entitled to a permit to continue operations (33 CFR 126.31 and 160.109).

b. Vessels may be prohibited from mooring at the facility, to prevent possible damage to the vessel brought about by hazardous conditions. A vessel already moored may be required to depart the facility for the same reason (33 CFR 160.111).

I. CORRECTIVE ACTIONS AND PENALTY AUTHORITY

1. Corrective Actions

Effective corrective actions are necessary to deter repeat discrepancies that endanger lives, property, and the environment. At a minimum, the discrepancy must be corrected. Additional actions provide a greater incentive for future compliance. The COTP must select an appropriate action for each discrepancy depending upon the seriousness of the discrepancy and the facility operator's history of compliance. Each discrepancy found and each corrective action taken must be documented in MSIS. Chapter 4 in volume I of this manual provides additional guidance on selecting appropriate actions. If a civil penalty is selected, the COTP must recommend an appropriate penalty using the guidance in COMDTINST 16200.3A. For each discrepancy found, one or more of the following actions may be taken:

a. On-the-spot correction.

b. Violation case: COTP Letter of Warning issued.

c. Violation case: Forwarded to district commander for civil penalty action. (By law, all violations of 49 CFR 171-179 requirements must be forwarded for civil penalty action by the district commander.)

d. COTP Order (suspend transfer, prohibit vessels from mooring at facility, etc.).

e. Action against a facility's Letter of Adequacy or General Permit.

f. Referral to a U.S. Attorney for prosecution (in extreme cases).

2. Penalty Authority

When developing a violation case, the correct penalty authority must be cited. The appropriate penalty authorities are listed below. Further guidance on appropriate penalties for violation cases is contained in COMDTINST 16200.3A.

Bulk Liquefied Natural Gas Waterfront Facilities

a. Bulk Liquefied Natural Gas Waterfront Facilities. The regulations in 33 CFR 127 are issued under the statutory authority of the PWSA. Violations are subject to the civil and criminal penalties under 33 U.S.C. 1232. The maximum civil penalty is $25,000 per violation and each day of a continuing violation constitutes a separate violation.

Bulk Liquefied Hazardous Gas Waterfront Facilities

b. Bulk Liquefied Hazardous Gas Waterfront Facilities. The regulations in 33 CFR 126 are issued under the statutory authority of the PWSA. Violations are subject to the civil and criminal penalties under 33 U.S.C. 1232. The maximum civil penalty is $25,000 per violation and each day of a continuing violation constitutes a separate violation.

Dry Bulk Waterfront Facilities

c. Dry Bulk Waterfront Facilities. The regulations in 33 CFR 126 are issued under the statutory authority of the PWSA. Violations are subject to the civil and criminal penalties under 33 U.S.C. 1232. The maximum civil penalty is $25,000 per violation and each day of a continuing violation constitutes a separate violation.

Packaged Hazardous Material Waterfront Facilities

c. Packaged Hazardous Material Waterfront Facilities. These facilities are also regulated under 33 CFR 126 and violations of those requirements are subject to the civil and criminal penalties under 33 U.S.C. 1232. Packaged hazardous materials are also subject to the requirements in 49 CFR 171-179 which are issued under the HMTA. Those violations are subject to the penalties under 49 U.S.C. 1809 which provides for a maximum civil penalty of $25,000 per violation or possible criminal prosecution. The law requires a minimum penalty of at least $250 per violation. Therefore, all violations of the 49 CFR 171-179 requirements must be forwarded for civil penalty action by the district commander.

CHAPTER 8: OFFSHORE ACTIVITIES

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CHAPTER 8: OFFSHORE ACTIVITIES

A. INTRODUCTION

This chapter is split into two sections summarizing policies which have evolved affecting the regulation of offshore activities on the U.S. Outer Continental Shelf (OCS), and the inspection of U.S. and foreign flagged vessels operating in the mineral and oil industry both in U.S. and foreign waters; and Fixed Offshore Platforms falling under Coast Guard jurisdiction.

B. REGULATIONS PERTAINING TO INSPECTION OF U.S. AND FOREIGN FLAG MOBILE OFFSHORE DRILLING UNITS (MODU'S)

1. 46 U.S.C. 3301 The U.S. Code requires that seagoing MODU's be inspected by the Coast Guard. These vessels must meet 46 CFR Subchapter I-A, and 33 CFR Subchapter N when working on the U.S. OCS. MODU's, when U.S. flag, must hold a valid Coast Guard Certificate of Inspection (COI), or, when foreign flag, a Coast Guard Letter of Compliance (LOC).

2. MODU Categories MODU's are categorized for the purpose of regulation application as either new or existing. A new U.S.-flag MODU is one that was contracted for on, or after 3 January 1979. A new foreign flag MODU is one that was contracted for on, or after 5 April 1982. U.S. and foreign units built or contracted for before these dates are considered existing, and are regulated accordingly.

3. Applicability of Regulations U.S. and foreign flag MODU's are regulated as follows:

New U.S. Flag MODU's

a. New U.S. Flag MODU's. New U.S. flag MODU's are subject to the requirements of 46 CFR Subchapter I-A, SOLAS 74/78 if self-propelled, and 33 CFR Subchapter N if operating on the U.S. OCS.

Existing U.S. Flag MODU's

b. Existing U.S. Flag MODU's. Existing U.S. flag MODU's are subject to the requirements of NVIC 4-78, SOLAS 74/78 if self-propelled and 33 CFR Subchapter N, if operating on the U.S. OCS.

New Foreign Flag MODU's

c. New Foreign Flag MODU's. When operating on the U.S. OCS, new foreign flag MODU's are subject to the requirements of 33 CFR Subchapter N. If electing to meet the requirements with IMO Certification, the Code Certificate issued by the contracting administration must indicate full compliance. Modified types, such as the Panamanian Type "B" Certificate, are not acceptable. When self propelled, these units must hold either SOLAS or IMO certification. New foreign flag MODU's, when in compliance with the above, are issued LOC's by the Coast Guard (see NVIC 3-88 for discussion).

Existing Foreign Flag MODU's

d. Existing Foreign Flag MODU's. When operating on the U.S. OCS, existing foreign flag MODU's are subject to the requirements of 33 CFR Subchapter N. These units may demonstrate compliance by either, IMO certification, or meeting NVIC 4-78. Modified IMO Code Certificates are not acceptable. These MODU's, when in compliance, are also issued LOC's.

C. INSPECTION STANDARDS FOR U.S. FLAG MODU'S

1. New MODU's

New U.S. flag MODU's, are inspected and certificated under the provisions of 46 CFR Subchapter I-A. MODU's operating on the U.S. OCS are also required to have annual on-site inspections, in accordance with the OCS Lands Act Amendments of 1978 (43 U.S.C. 1331, et. seq.). Unless in a laid-up status, these vessels must maintain compliance with their COI regardless of location or whether in the floating or bottom bearing mode.

2. Existing MODU's

NVIC 4-78 was developed to elaborate on the grandfather provisions of the then, newly developed MODU regulations for the estimated 150 existing, oceangoing, U.S. flag MODU's. The standard applied to existing units was less stringent than for new units, however, a progressive upgrading was built into the NVIC by virtue of the requirement that certain equipment be replaced to the standards prescribed in 46 CFR Subchapter I-A once the existing equipment was considered no longer serviceable. The grandfather provisions of NVIC 4-78 are no longer available to any MODU seeking its initial COI.

3. SOLAS and IMO MODU Code Procedures

Self-propelled MODU's of 500 or more gross tons, engaged in international voyages, are subject to the requirements of SOLAS 74/78. On 26 July 1982, the Commandant advised the Secretary General of the International Maritime Organization (IMO) that the U.S. accepted the IMO MODU Code as equivalent to the requirements of SOLAS 74/78 for such vessels. As a result of this action, these MODU's have the option of complying with either SOLAS or the IMO MODU Code. In addition, there are a large number of MODU's, not subject to SOLAS, which may be eligible to receive IMO MODU Code Certificates. They include jack-ups and non-self propelled units. Currently, a unit which complies with Subchapter I-A, does not necessarily comply with the IMO MODU Code. Any future revisions of Subchapter I-A are intended to dovetail I-A with the IMO MODU Code.

Written Request Required

a. Written Request Required. Upon written request of the vessel owner, U.S. MODU's may be inspected for compliance with the IMO MODU Code. Builders/owners of new units should specify at the time of plan review, whether or not they desire an IMO MODU Code Certificate. IMO MODU Code inspections are normally conducted in conjunction with inspections for certification. When conflicts exist between the IMO Code and the provisions of Subchapter I-A, the owner may request an exemption under paragraph 1.4, or, equivalency under paragraph 1.5 of the Code, as appropriate. Written requests for exemptions and equivalencies shall be forwarded to (G-MOC-2) for action. Sufficient justification must be provided by the owner in order for the request to be given consideration. OCMI endorsements are requested. Once exemptions or equivalencies have been approved by the Commandant, the International Maritime Organization (IMO) will be advised in accordance with the Code. Exemptions must be listed on the IMO MODU

Code Certificate. Deviations from the code should be discouraged. Upon satisfactory completion of the inspection, an IMO MODU Code Certificate (Form CG-5334) shall be issued to the vessel (See MSM II-A3.). The certificate should be dated to expire not later than 2 years from the date of the inspection, or coincident with the expiration of the COI, whichever comes first. When issued to self propelled MODU's, it is considered a substitute for the SOLAS Safety Equipment Certificate and Safety Construction Certificate.

Issuance by Coast Guard

b. Issuance by Coast Guard. IMO MODU surveys of U.S. flag MODU's, and the issuance of IMO MODU Code certificates will be performed only by the Coast Guard. Authorization to perform these surveys has not been extended to any classification society. Foreign flag MODU's are issued IMO MODU Code Certificates by their respective governments or third party organizations designated by them. The Coast Guard is of the opinion that the IMO MODU Code is applicable only to MODU's, i.e., mobile units that are capable of engaging in drilling operations. IMO MODU Code Certificates will not be issued to U.S. units other than MODU's, nor will the privileges allowed in Coast Guard regulations for vessels in possession of IMO MODU Code Certificates be extended to foreign vessels unless they are MODU's.

MSIS

c. MSIS. Issuance of an IMO MODU Code Certificate should be recorded in MSIS by an entry in VFLD and in comment in the narrative section of the MIAR.

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4. Laid-Up MODU's Often MODU's are laid-up in coastal areas for extended periods of time pending drilling contracts. The following guidelines are to be followed when a MODU is placed in lay-up status:

Notification

a. Notification. The owners of the MODU must notify the cognizant OCMI in whose zone the MODU is to be laid-up. A stacking plan should be submitted and reviewed by the OCMI. As a minimum, it should contain the following information:

- Location;
- Crew onboard, if any;
- Tank levels;
- Anchor arrangements;
- Communications;
- Maintenance of Fire Fighting/Lifesaving equipment; and
- Means to evacuate personnel in case of emergency.

COI Status

b. COI Status. MODU's may be laid-up offshore or in protected waters. It is not required that an owner/operator surrender or deposit the unit's COI. If the owner does not conduct the surrendered to the OCMI. All units laid-up in U.S. waters shall meet the lighting and sound signal requirements of 33 CFR Part 67, or, when laid-up overseas, the 72 COLREGS, or rules of the flag state government exercising jurisdiction over the waters where the rig is to be stacked. When an owner/operator advises the cognizant OCMI that a MODU is to be laid-up in U.S. waters, it shall be determined through the COTP that the unit is not obstructing any designated navigation lanes or channels. Additionally, the district navigation office shall be notified for the purpose of publishing a local Notice to Mariners.

Reduced Maintenance Crew On Board, Certificated MODU

c. Reduced Maintenance Crew On Board, Certificated MODU. When a reduced maintenance crew will be aboard a certificated MODU, the OCMI may amend the COI to permit a reduction in required crew. Lifeboatmen must be provided in accordance with 46 CFR 109.323.

Reduced Maintenance Crew On Board, Surrendered or Expired COI

d. Reduced Maintenance Crew On Board, Surrendered or Expired COI. When a reduced maintenance crew will be aboard a MODU with a surrendered or expired COI, the owner/operator shall agree in writing, to maintain the lifesaving, fire fighting, communications and other equipment determined necessary by the cognizant OCMI, to ensure the safety of personnel. The owner shall provide further written assurance to the OCMI that the unit will be manned with a sufficient number of persons capable of maintaining the unit in a safe condition under all circumstances, particularly if the unit is in the floating mode. Failure to abide by this agreement may result in violations of the Marine Safety Act of 1984 (46 U.S.C. 2301).

Reactivation

e. Reactivation. Prior to placing a stacked MODU back into service, all outstanding deficiencies and worklist items must be completed. When a COI is reissued, the unit must meet the same inspection requirements imposed as when it was last inspected, that is, any "grandfather" provisions previously afforded the unit will remain intact. However, the unit must meet any additional newly promulgated requirements, applicable to existing units, that would have applied to the unit had it remained in continuous service. Vessels which surrendered their COI will be required to complete an inspection for certification, including a drydocking or special underwater examination, if due.

No Extensions

f. No Extensions. When COI's are not surrendered, owners/operators should be advised that when the unit is returned to service no additional extensions of drydock requirements will be granted other than what is permitted under current regulations.

5. Maritime Administration (MARAD) Custodianship of Laid-Up MODU's

The following information is provided to assist in the movement and lay-up of MODU's which have been acquired by MARAD.

a. Prior to moving any MODU with an expired COI, the OCMI in whose zone the unit is located shall be contacted to perform an inspection pursuant to issuance of a change of employment certificate. Non-self-propelled units may be moved to their lay-up location without any U.S. Coast Guard involvement if the entire voyage lies within the Boundary Line.

b. The cognizant OCMI in the receiving zone shall be contacted to review stacking arrangements.

c. It is possible that MARAD may take possession of some MODU's while they are located overseas. In this case, the following OCMI's shall be contacted prior to engaging in any wet tows of these units from the areas listed below to U.S. ports:

(1) Activities Europe/MIO Europe - North Sea, Mediterranean, Africa and the Middle East.

(2) Far East Activities/MIO Japan - Far East, Oceania.

(3) OCMI New Orleans - South and Central America.

6. Reflagging and Certification of Existing Foreign MODU's

NVIC 10-81 and Change 1 were developed to allow certain categories of existing foreign flag vessels to be brought under U.S. flag in a manner consistent with the principles and levels of safety in current Coast Guard regulations or, in some cases, to the Coast Guard standards in effect at the time of the vessel's construction.

7. Conversion of a Self-Elevating MODU to a Fixed Production Facility

Owners of self-elevating MODU's that will be converted to production facilities have three options with respect to certification of the proposed unit. In each case the owner should notify the cognizant OCMI, in writing, of their intention. After reviewing the proposal, the OCMI should notify the respective owner of what plan review and inspection actions are necessary. Units originally certificated under NVIC 4-78 that are converted to fixed OCS facilities or are re-certificated under 46 CFR Subchapter I will not be able to retain their MODU "grandfather" status allowed under the NVIC. Any systems which fall under Coast Guard jurisdiction as outlined in the USCG and Minerals Management Service Memorandum of Understanding (MOU), signed on 29 Aug 1989 will be the subject of Coast Guard review and approval. Once the conversion is approved, it will be subject to the requirements found in 33 CFR Parts 140-147. If the facility received a Coast Guard inspection within 6 months of the conversion, it will not have to undergo an initial inspection and the owner/operation shall complete the self-inspection at the next annual inspection date.

Option 1 - Surrendered COI

a. Option 1 - Surrendered COI. A self-elevating unit that is converted to a production facility and is no longer capable of engaging in drilling as a result of removal of all or part of its drilling equipment may be considered a fixed OCS facility by the Coast Guard. In order to be considered a fixed OCS facility, the unit's COI and document must be surrendered, the jacking gear must be disabled so that the unit cannot be easily lowered to the water, and three of the following four items must be removed from the unit: the derrick, mud pumps, rotary facilities will be subject to the requirements of 33 CFR Subchapter N pertaining to fixed OCS facilities, as appropriate. Such units will not be subject to inspection as a MODU. Additionally, the facility will be subject to Mineral Management Service (MMS) requirements. A unit which surrenders its COI, may be moved after a period of time to another location without losing its status as a fixed OCS production facility. However, if the unit must be refloated in order to be moved to a new location, it must undergo an inspection for change of employment by the cognizant OCMI. Such units will be required to comply with the inspection requirements for seagoing barges under 46 CFR Subchapter I. As part of this inspection, the unit will be required to undergo a drydock or special underwater examination, to ensure the hull is watertight and sound, unless evidence is presented of a satisfactory drydock or special exam within the past three years. The unit will be required to comply with the appropriate loadline regulations. A review of the unit's plans and stability may also be required. Upon completion of a satisfactory inspection, the unit should be issued a limited or short-term certificate in accordance with 46 CFR 91.01-10(c). Upon completion of the move and once the unit is elevated on its new location, the unit will be required to disable its jacking gear to the satisfaction of the OCMI. If the OCMI determines that the normal operation of the unit will require it to be frequently refloated, then the unit will not be eligible for consideration as a fixed OCS facility. Such units will be required to remain vessels and be subject to the vessel inspection laws. If the unit changes its employment and becomes a fixed offshore facility, it cannot retain any of the "grandfather status" allowed in NVIC 4-78, titled Inspection and Certification of Existing Mobile Offshore Drilling Units.

Option 2 - Unit Re-certificated Under 46 CFR Subchapter I

b. Option 2 - Unit Re-certificated Under 46 CFR Subchapter I. A self-elevating unit that is converted to a production facility and is no longer capable of engaging in drilling as a result of removal of all or part of its drilling equipment may be re-certificated as a miscellaneous self-elevating vessel under 46 CFR Subchapter I, if the owner does not desire to relinquish the vessel's COI or the Mobile Offshore Production Unit (MOPU) requires frequent relocating as mentioned in Option 1. The unit will be required to undergo periodic inspections as required by Subchapter I, including hull examinations. Since the requirements of Subchapter I will probably not completely address the unit's unique operation, the unit will be required to meet certain requirements of Subchapter I-A. These items include design and operation of cranes, stability, hazardous areas, lifesaving equipment, fire fighting equipment and helo decks. Where systems serve both "production" and "ship's service," an interface point must be identified during review, to establish jurisdiction between the Coast Guard and MMS. A MODU/MOPU operating under this option loses its grandfather status allowed in NVIC 4-78. Additionally, if the MOPU stores oil in bulk it is considered a tank vessel. Therefore, it must comply with the requirements found in 46 CFR Subchapter D, Tank Vessels and 33 CFR 157, Rules for the Protection of the Marine Environment Relating to Tank Vessels Carrying Oil in Bulk. When a MODU undergoes such a change, an inspection note (MISN) entry shall be made in MSIS identifying the date of change and whether or not the tank vessels rules apply.

Option 3 - Status Unchanged

c. Option 3 - Status Unchanged. Self-elevating units that are converted to production facilities but retain their drilling equipment on board and remain capable of engaging in drilling will remain certificated as MODU's and are allowed to maintain their grandfather status as found in NVIC 4-78. Such units must continue to meet all requirements of 46 CFR Subchapter I-A. Some "production systems" on these units will also be subject to review by the Coast Guard when they are common with a ship's service system. In these systems, an interface point must be established during review in order to delineate jurisdiction. As in Option 2., any MOPU that is used for storing oil in bulk is considered a tank vessel. Therefore, it must comply with the requirements found in 46 CFR Subchapter D, Tank Vessels and 33 CFR 157, Rules for the Protection of the Marine Environment Relating to Tank Vessels Carrying Oil in Bulk.

8. Conversion of a MODU to Fixed Entertainment Facility

A submersible, or self-elevating MODU that is converted to a fixed entertainment facility is subject to the following:

a. The unit will no longer be considered a vessel for the purposes of vessel inspection provided, it is converted in such a manner as to be incapable of being used as a means of water transportation in any manner, and, it is substantially permanently moored or fixed.

b. A converted MODU used for the purpose of entertainment will no longer be considered as engaging in the development, exploitation, exploration or production of oil or mineral resources on the U.S. OCS. Once the conversion is completed, a unit will not be subject to the provisions of 33 CFR Subhapter N, but must continue to comply with 33 CFR Subchapter O (Pollution) and the provisions of 33 Subchapter C (Aids to Navigation).

c. Any floating dock intended to be used as a boarding platform for the facility will be considered a permanently moored vessel, not subject to vessel inspection laws, provided it is substantially moored such that it cannot be moved without special effort. Specifications and detailed drawings of the floating platform and its associated mooring systems are to be submitted to the cognizant OCMI for review and final determination of its status for inspection purposes.

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9. Floating Offshore Production Facilities

Novel floating production facilities have recently been developed to produce oil offshore. They include semi-submersible and tanker conversion; tension leg platforms, floating production storage and off-loading facilities. Authority to inspect all facilities on the OSC comes from the Outer Continental Lands Act (OCSLA), 33 U.S.C. 1333 (d) (1), 1348 (c) and 1356. Inspection and review of these facilities requires the application of the USCG/MMS MOU dated 29 August 89 to determine system jurisdiction and the application of appropriate inspection regulations, both during construction and following installation. In addition, state and local approvals may be necessary. Each novel facility proposal received should be forwarded to Commandant (MOC-2) for review. FSPO regulations are found in 33 CFR 143.120.

a. The owner/operator of each facility must submit plans to the Coast Guard for approval. The plans shall be in accordance with 46 CFR Part 107, Subpart C. If the construction of the facility is initiated prior to Coast Guard plan review and approval, and discrepancies shall be rectified prior to placing the facility in operation.

b. Each facility shall be constructed to a standard acceptable to the Commandant and must comply with the following:

(1) 46 CFR, Subchapter F, Marine Engineering

(2) 46 CFR, Subchapter J, Electrical Engineering

(3) 46 CFR, Subchapter I-A, Part 107, Inspection and Certification

(4) 46 CFR, Subchapter I-A, Part 108, Design and Equipment

(5) 33 CFR, Part 67, Aids To Navigation on Artificial Islands and Fixed Structures

(6) 33 CFR, Subpart B, Part 155.400, Platform machinery space drainage on oceangoing fixed and floating drilling rigs and other platforms.

(7) 33 CFR, Part 159, Marine Sanitation Devices. Upon meeting the requirements found in this section, the cognizant OCMI will issued a Certificate of Inspection to the facility. The service of a self-propelled facility will be "Tankship" and the service of a non self-propelled facility will be "Tank Barge". The COI shall be valid for a period of years. The facility shall receive a mid-period examination between 10 and 14 months of the anniversary date of the COI. If the unit is self propelled then all of Subchapter I-A is applicable.

Drydocking Requirements

c. Drydocking Requirements. Floating Production Storage and Offloading units shall be drydocked twice in a 5 year period with the longest span between examinations not to exceed 3 years. Given the unique designs and employment of FPSO's they may opt to undergo special examination in lieu of drydocking. This program must be specifically approved by Commandant (G-MOC). The owner/operator must submit the plans following the criteria found in 46 CFR 107.265. The plan shall be drafted to address the intended lifespan of the FPSO unit.

Additional Requirements for Stowage of Oil in Bulk

d. Additional Requirements for Stowage of Oil in Bulk. Floating production facility which is also used for storage of oil in bulk will be considered a tank vessel and must comply with the regulations found in:

(1) 46 CFR, Subchapter D, Tank Vessels

(2) 46 CFR, Subpart 157, Rules for the Protection of the Marine Environment Relating to Tank Vessels Carrying Oil in Bulk.

Conversions

e. Conversions. When an existing ship, tankship or tank barge is converted to a FSPO unit, the Commandant (G-MOC) shall determine on a case by case basis, if the conversion is considered major and of OPA 90 requirements are applicable (e.g. double hulls).

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10. Review of MODU Operating Manuals

As of 1 July 1989, revisions to the requirements for operating manuals for all new and existing MODU's became effective. Review and approval of the new manuals shall be accomplished through the following procedures:

a. The Marine Safety Center (MSC) will review manuals of existing units for compliance with 46 CFR 109.121(c)(1), (3)-(7), and (9)-(18) and, if acceptable, forward the manual, together with the results of the review, and an undated stability letter, to the OCMI. The OCMI will then review the remaining sections of the manual, accepting MSC's review for compliance with the aforementioned sections as appropriate, and if satisfied, approve the manual, as well as date and issue the stability letter.

b. After issuance, the OCMI will forward a copy of both the stability letter and the letter approving the manual to the MSC. If during the life of the unit, the OCMI becomes aware of changes to the manual, or unit, which would affect stability or conditions under which the stability letter was developed, MSC should be notified.

c. The Marine Safety Center will review the entire operating manual in the case of new units.

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11. Anchor Requirements for MODU's

46 CFR 108.705 requires that all MODU's be equipped with anchoring gear in accordance with ABS requirements. Initially, the ABS required anchors and chain on both self-elevating and surface units. The ABS discontinued the anchor requirement for surface type MODU's in 1982. Until new regulations regarding anchors for MODU's are developed, units are not required to carry anchors.

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12. Electrical Installations on MODU's

There is evidence of some installation of non-armored cable in Class 1, Division 1 hazardous areas. The installation appears to have been during initial construction of the MODU. 46 CFR 111.105-15 and IMO MODU Code require the installation of armored cable in all Class 1, Division 1 hazardous areas. Should any non-armored cable be discovered during an inspection and there is the potential for mechanical damage to the cable in these zones, there are three options for the marine inspector to follow:

a. The cables in question should be replaced with armored cable.

b. The cables should be relocated outside the hazardous zones.

c. An alternate means shall be provided to protect the cables from mechanical damage. All damaged cables should be replaced immediately with Coast Guard approved armored cables or an equivalent. Each equivalency request shall be reviewed on a case by case basis. Any non-armored cabled found in a hazardous area that is not damaged and not subject to imminent damage may remain in place until renewal is required.

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13. Acceptance of Temporary Industrial Equipment Installed on U.S. Flag MODU's Operating in Foreign Waters

a. Discussion. U.S. flag MODU's operating in foreign waters are sometimes subject to coastal state requirements and equipment availability problems unique to their location. Subcontractor services, including well logging, cementing, casing perforation, etc., often require temporary installations. These installations may include electrical equipment, pressure vessels, packaged boilers, etc. Temporary industrial installations provided by local contractors sometimes meet local equipment listing (certification) or design code requirements. From a practical standpoint, it has become necessary to acknowledge coastal state requirements and logistical problems, and permit temporary installations that are approved by the coastal state, when it is safe to do so. The intent of this policy is to fulfill the safety principals and features embodied in U.S. regulations while recognizing the operational constraints in some geographical areas.

b. Coastal State Requirements. Where temporary equipment or systems are installed, those items listed by an independent laboratory or, constructed to a recognized design standard may be permitted by the OCMI in whose zone the vessel is operating. In making a decision to permit temporary installations, a review of records relating to design, testing and inspection of equipment such as boilers and pressure vessels should be conducted. The frequency and scope of recorded inspections should approximate U.S. regulations. Upon return to U.S. waters and prior to engaging in OCS activities, MODU's must fully comply with equipment listing requirements in U.S. regulations.

Independent Laboratories.

Listed below are some independent laboratories which are acceptable, provided they are recognized by the coastal state. This list is not intended to be all inclusive.

1. Canada

(CSA) Canadian Standards Association
178 Rexdale Boulevard
Rexdale, Ontario, Canada
M9W 1R3

2. Denmark

(DEMKO) Delta Electronics Testing
(formerly Eleketronikcentralen)
Venlighedsvej 4
DK-2970 Hoershol, Denmark

3. Norway

(DnVC) Det Norske Veritas Classification AS
DnVC Laboratory Department
P.O. Box 300
Veritasveien 1
N-1322 Hovik, Norway

(NEMKO) Norges Elektriske Materiallkontroll
P.O. Box 73 Blindern, N-0314
Gaustadalleen 30 Oslo, Norway

4. Germany

(PTB) Physikalisch-Technische Bundesanstalt
Bundesalle 100
38116 Braunschweig, Germany

(VdS) Verband der Sachversicherer e.V.
Postfach 10-37-53, 50477
Amsterdamer Strasse 176-178, 50735
Koln, Germany

6. United States

(ETL) ETL Testing Laboratories, Inc.
(Inchcape Testing Services -Warnock Hersey)
3933 U.S. Route 11
Industrial Park
P.O. Box 2040
Cortland, NY 13045-0950

(FM) Factory Mutual
1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062

(IMANNA) IMANNA Laboratory
P.O. Box 560933
Rockledge, FL 32956-0933

(MET) MET Laboratories, Inc.
914 W. Patapsco Ave.
Baltimore, MD 21230-3432

Retlif Testing Laboratories
795 Marconi Ave.
Ronkonkoma, NY 11779

(SwRI) Southwest Research Institute
6220 Culebra Rd.
Post Office Drawer 28510
San Antonio, TX 78228

(UL) Underwriter Laboratories
333 Pfingsten Rd.
Northbrook, IL 60062-2096

Independent Laboratories - Continued	
5. U.K. (BASEEFA) British Approvals Service for Electrical Equipment in Flammable Atmospheres Harpur Hill Buxton, Derbyshire, U.K. SK17 9JN (LPC) Loss Prevention Council Melrose Ave. Borehamwood, Herfordshire, U.K. WD6 2BJ	

14. Lifesaving Equipment

a. Excess Capacity of Lifeboats

(1) Lifeboat capacity in excess of that required by 46 CFR 108.503 may be substituted for liferafts as permitted by 46 CFR 108.505(c), subject to the following provisions:

(a) No single lifeboat or liferaft shall be credited with more than 100 percent of persons allowed on the MODU;

(b) Lifeboats must provide for at least 100 percent capacity;

(c) Lifeboats and liferafts combined must provide for at least 200 percent capacity; and

(d) Lifeboats and liferafts must be arranged so that a limited area fire or other casualty does not immobilize lifeboats and/or liferafts accommodating more than 100 percent capacity.

(2) The above policy satisfies the intent of 46 CFR 108.503 and 108.505, i.e., to require each MODU to have a total combined lifeboat/liferaft capacity to accommodate 200 percent of the persons allowed on board. MODUs equipped with lifeboats and liferafts in accordance with U.S. regulations may not necessarily be in compliance with the IMO MODU Code. Therefore, when certificating units for operation in other than domestic service, the operator should be cautioned that a COI does not certify compliance with the IMO MODU Code. The IMO Code requires certain survival craft be arranged for float free operation. Under 46 CFR 108.506(c), each liferaft which is launched from a position more than three meters above the water is required to be davit launched.

(3) The IMO MODU Code does not specifically provide for substituting lifeboats for liferafts. When inspecting MODUs for issuance of an IMO MODU Code Certificate, additional lifeboats or liferafts may be necessary to meet the requirements of both Subchapter I-A (davit launch capability) and IMO (float free). If davit launched liferafts are also arranged for float free operation and accommodate 100 percent of the persons allowed on board, then they meet the requirements of both U.S. regulations and the IMO MODU Code. An alternative might be installing lifeboats to accommodate 200 percent capacity (meeting U.S. regulation - with substitution) and float-free, throw-over rafts for 100 percent capacity (meets IMO requirement for float-free).

b. Use of Throw-over Liferafts and Lifefloats Aboard MODU's

(1) Throw-over liferafts are not permitted EXCEPT for submersible MODU's which are permitted by NVIC 4-78 to continue to substitute Coast Guard approved throw-over inflatable liferafts and an approved rescue boat, for the required davit launched lifeboats.

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15. Staterooms Accommodating More Than Four Persons

Staterooms for personnel not normally employed on a MODU are permitted by regulation to accommodate up to six persons. Current rules for industrial vessels certificated under Subchapter I, do not permit this arrangement. Only MODU's may have such arrangements, and only when they meet the required criteria. Specifically, that these spaces are occupied by persons not normally employed on the MODU, and these persons are on board the rig only temporarily. They include well, cement, mud, wire line and similar type service personnel. It does not include the MODU's typical complement of tool pushers, drillers, mechanics, roughnecks, roustabouts, caterers and others similarly employed. These staterooms must be specifically approved by Commandant (G-MMS). During the early days of rig construction and certification of Mobile Offshore Drilling Units, this provision was not changed by the 1987 rulemaking. Furthermore, the 6 person stateroom provision was extended to some drilling tenders. Where these arrangements can be shown to have been approved since construction, they may remain in service. Should questions arise as to their approval status, the vessel files should be researched to determine original status.

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16. MODU Drydocking Interval and Requests for Extension

The prescribed interval between drydocking or underwater survey is contained in Subchapter I-A. The general provisions regarding drydock exams (DE) and extensions found in Chapter 8, MSM are applicable to MODU's to the extent practicable given the special nature of their service and movement. Requests for extension of a drydock or special underwater survey on MODU's should be considered equipment listing (certification) or design code on a case by case basis using the following additional guidance:

a. Intervals for drydocking or special examination for Mobile Offshore Drilling Units were not changed by the 1987 rulemaking that extended the drydocking interval for vessels in ocean service to "twice in a five year period." However, until there is a revision of 46 CFR Subchapter I-A, Mobile Offshore Drilling Units, the policy found in this section shall be followed. To allow for the same basic for MODU's, as allowed for other vessel types, by the 1987 rulemaking; the "twice in a five year" interval has also been incorporated into the 1989 IMO MODU Code.

b. Until such time as a revised Subchapter I-A is published, the "twice in a five year" interval for drydocking or special examination shall be extended to MODU's under the authority of 46 CFR 108.105. All other provisions of 46 CFR 107.261, 107.265, and 107.267 remain unchanged.

c. The beginning of the five year period will be the credit date of the previous hull exam. Every effort should be made to encourage owners and/or operators of MODU's to complete the next hull exam between the second and third year anniversary (one year "window"), and in conjunction with a rig move, when both the upper hull and underwater portions of the exam can be conducted. In cases where this is not practical, (independent leg jack-up, on location) the upper hull exam should be conducted and credit given, with a requirement to complete the underwater examination at the next rig move. Such a procedure should alleviate the need for hull exam extensions, even at the end of the five year period. Outstanding requirements must be closely monitored to insure they do not remain outstanding for excessive periods.

d. At the end of the five year interval, operators should be encouraged to complete the hull exam early, if necessary, so that it may be accomplished during a rig move, when both the upper hull and underwater portions of the exam can be completed. Such exams may be credited as of the date the five year cycle would end even though conducted early.

17. Raw Water Towers

The raw water tower is usually the sole source of supply water for vital systems including firewater and engine cooling, and should be given close scrutiny during drydock inspections or special underwater surveys in lieu of drydocking on all MODUs. At this inspection the tower should be raised lowered to the extent necessary to allow a complete inspection to ensure its structural integrity. Particular attention should be paid to the rack to chord connections. If the tower is of two piece construction with a flanged midsection, the area in way of the flange should be closely examined for fracturing.

18. Special Underwater Inspection In Lieu Of Drydocking (UWILD)

a. Discussion. The purpose of an examination of the underwater body is to make an evaluation of the condition of the hull and its fittings. Of primary concern are the effects of corrosion, and hull damage. If these are not detected and corrective action taken, they could lead to reduced strength and loss of hull integrity. Insofar as practicable, the special examination in lieu of drydocking shall be conducted using the same procedures as in a regular drydocking examination. Due to the complicated nature of conducting these examinations, owners/operators should initiate planning discussions with the OCMI well before a scheduled UWILD.

Guidelines

b. Guidelines. Many factors are to be considered before approving these requests, including rig operations, weather, and diving conditions. NVIC 1-89 also offers excellent guidance on the procedures for approval and conduct of an UWILD exam. The process for conducting a UWILD should dovetail with this NVIC. The following guidance is provided:

(1) Prior to the examination, there should be a pre-inspection meeting between the Coast Guard and owner/operator of the MODU. The owner/operator shall provide to the OCMI a set(s) of plans detailing the MODUs hull design, showing all through hull fittings and original scantlings. The owner/operator shall submit an inspection plan to the OCMI for approval. Items to be covered during the meetings should include:

(a) A hull gauging strategy should be agreed upon detailing the method to be employed and critical locations to be examined.

(b) The contract divers should be presented to the OCMI for approval. The divers should be experienced in conducting UWILDs. Any divers certified by ABS will meet this requirement.

(c) Agreement should be reached concerning which through hull fittings are to be opened for inspection.

If a partial inspection of through hull fittings are opened for inspection, an exact listing shall be made in the diary entry and an inspection note (MISN) detailing which valves were examined shall be made.

Marine Inspector shall carefully review the plans and video tapes of the previous exam (if available) prior to conducting the UWILD.

(2) The MODU will be placed in the lightest working draft within acceptable stability limits. The area above the waterline will receive a traditional examination. Particular attention should be paid to high stress areas such as the joints of structural members. All internal compartments shall be entered and visually examined. REMEMBER before entering a confined space ensure the space has been certified gas free by an NFPA certified Marine Chemist. All through hull fittings and sea valves shall be given the same examination as during a regular drydock examination.

(3) The hull shall be cleaned and free of marine growth.

(4) The Marine Inspector shall witness the underwater survey on the surface via television.

(5) The gauging of the hull may be internal or underwater. If acceptable to the OCMI, at every second examination, the owner may have the examination conducted while the unit is at its working draft. This examinations shall be conducted as above with the following exceptions:

(1) The hull gauging will, of necessity, have to be accomplished using underwater ultrasonic techniques.

(2) In addition, a representative number of welds in stress areas shall be examined using underwater ultrasonic techniques acceptable to the OCMI. Records of indications, such as sketches of detected flaws, will be maintained in sufficient from to be used for comparative purposes during subsequent inspections.

(3) Only the internal compartments which are accessible in the working condition will be entered and examined.

c. The Marine Inspector shall be satisfied that the non- destructive testing equipment is properly calibrated prior to the equipment employed.

Post Inspection Actions

d. Post Inspection Actions. The owner/operator or private contractors shall provide the Marine Inspector with the following:

(1) Copy of Underwater Hull Survey Video Tape

(2) Copy of Diver's Report

(3) Copy of Hull Gauging Report

(4) Copy of Results of Non-destructive Testing

Liveboating

e. "Liveboating". Underwater exams performed during rig movements may involve "liveboating". See 46 CFR 197 for a discussion of liveboating. When the rig owner or operator submits a request and plan for the underwater exam, they should be encouraged to also request a variance for "liveboating" should one be needed. All requests for a liveboating variance shall be forwarded to (G-MOC) for approval.

Approval Authority for Plans

f. Approval Authority for Plans. Delegation of approval authority of plans for special examination in lieu of drydocking, required by 46 CFR 107.261 has been extended to specific district (m) offices. These offices were also given authority to re-delegate approvals to OCMI's in their respective zones. Approval authority for surface type units only, has been retained by Commandant (G-MOC-2). Requests for approval of U/W examination in lieu of drydocking for surface type units should be forwarded to Commandant, via the District Commander, with the recommendation of the OCMI. If conceptual approval is granted by Commandant, the OCMI will review and approve the details of the plan, using NVIC's 12-69 and 1-89 as a guide. All underwater survey plans shall specifically address methods of testing confined spaces for toxic vapors and oxygen content and rescue equipment/methods available for removing an unconscious person from a confined space. Normally, this requires some portable lifting equipment. In all cases, the Class Society should be contacted for concurrent approval and a class representative should be on hand to witness the UWILD examination.

Internal Inspection of MODU Spud Cans

g. Internal Inspection of MODU Spud Cans. Subchapter I-A Regulation 107.261 and 107.267 require drydocking or special examinations in lieu of drydocking (SEILOD) for self elevating units. The MODU structural regulations in 46 CFR 108 recognize ABS Rules for Building & Classing Offshore Mobile Drilling Units, 1978. Similarly, standard policy has been to use the "Survey After Construction" rules and those for "SELOID" in evaluating and conducting SELOID inspections. For consistency purposes, OCMIs will not normally require internal examinations of spud cans until the MODU's second special survey (10th year) and at least 5 year intervals thereafter, in conjunction with each special survey. The marine inspector shall conduct external examinations of the MODU's spud cans in accordance with the regulations. Nothing in this section shall prohibit the equipment listing (certification) or design code on a OCMI from requiring an earlier internal examination if conditions warrant further scrutiny.

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19. Commercial Diving

Diving equipment which is permanently installed must comply with 46 CFR Subchapters F and J as mandated by 46 CFR 197.300. Pressure vessels for human occupancy (PVHOs must comply with 46 CFR 197.328, which requires construction and stamping in accordance with ASME PVHO-1, the American Society of upper hull and underwater portions of the exam can be Mechanical Engineer's safety standard for PVHOs. These equipment requirements apply to any installation where this subpart applies, including inspected vessels, platforms, MODUs, or foreign flag vessels engaged in OCS activities (see 197.202). Classification certificates for diving systems on foreign flag barges or vessels do not demonstrate compliance with the design requirements of our regulations. Different design standards often result in the need to de-rate or modify PVHOs. Other PVHO design standards have yet to be shown to provide an equivalent degree of safety. The regulations regarding alternatives to the regulations, typically called "variances", and for demonstrating equivalency, are provided in 46 CFR 197.206; as stated paragraph 197.206(b) both are (G-MOC) decisions. The process for equivalency determinations of apparatus or equipment involves (G-MOC), the Marine Safety Center, and the cognizant OCMI. It is outlined in Chapter 16, Section E. All requests for variances or equivalency determinations should be referred to G-MCO-2.

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20. Crane Inspection

On 25 May 1990, a Final Rule extending Cargo Gear Inspection Intervals was published in the Federal Register. This rulemaking extended the load testing interval on Subchapter D, H, and I vessels to five years. Subchapter I-A is undergoing a revision which will propose, among other things, the same periodic load testing intervals for cranes. Until these new rules are published, a five year periodic testing interval shall be extended to cranes on MODU's, under the authority in 46 CFR 108.105. All other provisions of 46 CFR 107.260 remain unchanged.

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21. Pollution Prevention

There are no additional equipment requirements for MODUs or Fixed OCS facilities. However the following restrictions apply:

a. The EPA issues National Pollution Discharge Elimination (NPDES) permits to MODUs and Fixed Platforms. These MODUs and Fixed Platforms which are operating in accordance with their (NPDES) permits are in full compliance with 73/78. Marine Inspectors are encouraged to review a MODU's or Platform's NPDES permit. Extreme caution should be used in determining whether or not they are in compliance with their permit. The NPDES permit is very specific as to the types of substances (both oils and NLS) allowed to discharge and the amounts. If a MODU or OCS Platform is not operating under its NPDES permit, all provisions of MARPOL 73/78 and the limitations found in 33 CFR 151.10 are applicable.

b. All MODUs operating (not en route) within 12 nautical miles of nearest land or within a special area and all fixed platforms within 12 nautical miles of nearest land must:

(1) Have a means to retain all machinery oily mixtures from the platform machinery space and be equipped to discharge oily mixtures for transport to a reception facility; or,

(2) Be equipped to discharge in accordance with 33 CFR 151.10 paragraphs (b)(3), (b)(4) and (b)(5).

D. "OPERATING VICE NAVIGATING"

When Title 46, U.S.C. was re-codified in 1983, the term "operating" was substituted for the term "navigating." Consequently, MODU's, when bottom bearing, are considered to be operating and therefore are required to maintain compliance with their COI's in accordance with 46 U.S.C. 3311. It has also been determined that this applies to any vessel which operates in both the afloat and self-elevating modes, i.e., liftboats and multi-service vessels, etc.

E. FOREIGN FLAG MODU'S OPERATING ON THE U.S. OCS

1. Letters Of Compliance

Foreign MODU's must be issued a Letter of Compliance (LOC) prior to engaging in drilling operations on the U.S. OCS. Under the provisions of 33 CFR 143.210, inspection of foreign MODU's is discretionary. However, it is policy that foreign units must be inspected prior to issuing an LOC. NVIC 3-88 contains details on inspection and procedure. An LOC issued to a foreign MODU under the authority of 33 CFR Subchapter N, is considered to be generally equivalent to a Coast Guard COI. The LOC is valid for one year, or until the unit departs the OCS, whichever comes first. All foreign flag MODU's must comply with one of the following options to obtain a LOC:

a. U.S. Standards. The design, equipment, and operating standards of 46 CFR 108 and 109, with the exemption allowed by 33 CFR 143.201.

b. Others. The design, equipment, and operating standards of the documenting nation, if they provide a level of safety equivalent to or greater than that set forth in 46 CFR 108 and 109. Currently, only Panama has been accorded this status for new MODU's.

c. Full IMO Compliance. The standards for design, equipment, and operation as set forth in the IMO MODU Code, and operating requirements of 46 CFR 109 for matters not addressed by the Code. This applies to units designed and constructed to the IMO MODU Code, and issued an IMO MODU Code certificate.

2. Equivalency of Panama's Existing MODU Rules

Panama's MODU rules are essentially based on the IMO MODU Code. Panama's Technical Note 1/83 modified their MODU rules for existing units that cannot comply with the IMO MODU Code. An evaluation of Panama's Technical Note 1/83 determined that, with the exceptions noted below, the rules for existing units are generally equivalent to those provided under 46 CFR 108 as applied to existing U.S. flag units. Commandant (G-MOC-2) shall be notified if examinations of Panamanian MODU's for issuance of LOC's under either 143.207(b) or 143.207(c) reveal a significant or an inordinate number of discrepancies. Existing Panamanian MODU's are eligible to receive an LOC under 33 CFR 143.207(b) provided:

a. They were built, under construction or contracted for prior to 5 April 1982 and are documented under the laws of Panama;

b. They hold and are in compliance with a valid Panamanian MODU Safety Certificate issued under the provisions of Technical Note 1/83;

c. The unit's boilers and pressure vessels have been satisfactorily internally examined or hydrostatically tested within 12 months of the date of application for an LOC;

d. A drydock or special underwater examination in lieu of drydock has been satisfactorily conducted within 24 months of the date of the LOC application;

e. All units (except those unclassed units built prior to 1969) have a valid loadline;

f. Units comply with the 70 and 100 knot wind intact stability criteria. A relaxation to a minimum 50 knot wind criteria may be permitted based on satisfactory previous service and appropriate limitation;

g. Units comply with the applicable operating requirements of 33 CFR 146.205;

h. All equipment installed in Zone 1 (Class 1, Division 1) or Zone 2 (Class 1, Division 2) hazardous areas, as defined in 46 CFR 108.170 through 177, is explosion-proof, intrinsically safe, or purged and pressurized, and in good material condition;

i. All units comply with the provisions of 46 CFR 108.123 and 108.127 in addition to meeting the structural fire safety requirements for interior stairways and wood construction found in Technical Note 1/83;

j. All units are in substantial compliance with the helo deck fire safety equipment standards found in 46 CFR 108.486 through 108.496 and 46 CFR 108.653;

k. The unit's lifeboats are rigid, totally enclosed, motor-propelled, fire protected, davit launched survival craft, and are constructed to comply with the requirements of SOLAS 74, Chapter III Regulations 5, 6 and 7 for lifeboats or the provisions of 46 CFR 160.035. Lifeboat equipment must be in accordance with 46 CFR 108.503 or the provisions of SOLAS 74, Chapter III, Regulation 11 for lifeboats. Liferafts must be equipped for ocean service in accordance with 46 CFR 108.505 or the provisions of SOLAS 74, Chapter III, Regulation 17 for liferafts;

l. Lifesaving appliance launching devices have been satisfactorily weight tested within 12 months of the date of the LOC application; and

m. Life preservers are provided for 125 percent of the persons allowed on board and are equipped with whistles, lights and retro-reflective material in accordance with 46 CFR 108.514. All units must comply with the requirements of 33 CFR 144.30 pertaining to exposure suits.

Technical Note 1/83 contains provisions which permit flexibility and the use of discretion in the application of certain inspection and equipment standards to existing units. Areas where discretion is permitted shall be shown to be acceptable to the cognizant OCMI. Items of particular interest found in Technical Note 1/83 to permit this discretion or flexibility are; foreign units must be inspected prior to issuing an LOC.

(1) Part B 3.4 - the accomplishment of major alterations;

(2) Part B 3.6 - the replacement of existing items of safety equipment that are no longer in good working order; and

(3) Part B 8.5 - the requirements for fire fighting systems and equipment.

3. Foreign MODU Operating Manuals

The provisions of 33 CFR 146 essentially state that a foreign unit must comply with the operating standards of 46 CFR 109, regardless of which LOC option is applied. NVIC 3-88 requires that the unit's operating manual be submitted to the cognizant OCMI for review. This review should consist of a verification of the content requirements of 46 CFR 109.121. When found complete, the LOC should be annotated accordingly. No Coast Guard "approval" or "examined" stamps shall be applied to these manuals. It should be noted that principal approval of the manual comes from the flag state or their designated representative. If an operations manual is not approved the Marine Inspector shall issue a deficiency requiring Flag State approval of the manual not to exceed 30 days.

F. PORTABLE TEMPORARY QUARTERS

There is a growing increase in the use of portable living quarters aboard MODUs and OSVs.

1. Plan Review

The plan review may be conducted locally for steel construction. Plan review for all other construction using alternative materials shall be conducted by the Marine Safety Center.

2. Means of Securing

Upon approval of the plans for the portable quarters, a review of the proposed installation must be completed. The following items must be addressed within the proposal and examined carefully by the marine inspector:

a. Copy of the approval letter for the quarters unit.

b. Physical location of the portable quarters aboard the vessel, including deck strength calculations.

c. Securing arrangements.

(1) Chains or nylon straps may be used to secure a temporary portable quarter to the deck of a ship. The chains shall be examined for excessive wear. No more than 25 percent wear is permitted on the chain links. Nylon straps shall be examined for pulls, chaffing and frays.

(2) Container pedestals shall be welded to the ships deck. The marine inspector shall insure approved welders and procedures are employed. The use of NDT to ensure full penetration of the weld was achieved.

d. Location of openings. Openings shall be so located as to eliminate crew exposure to hazards associated with vessel operations and sewage gases.

e. Effect on vessel's stability. The proposal may be forwarded to the Marine Safety Center for plan review if additional plan review is warranted by the OCMI.

3. Admeasurement It may be necessary to have the vessel re-admeasured upon installation of portable structures. Regulations require all permanent structures to be included in the tonnage measurement process. By definition, the means of securing the structure to the vessel is not the sole consideration for inclusion in the vessel's tonnage measurement. A space is considered permanent regardless of attachment to the vessel when it is enclosed and used aboard the vessel to further the enterprise of the vessel. All spaces meeting this requirement shall be included in a re-admeasurement of the vessel. Each time a portable quarters is added or removed from a vessel, the vessel shall be re-admeasured and a new Certificate of Documentation will be issued. If spaces are found to be exempt from inclusion in tonnage measurement, they may be noted on the vessel's tonnage certificate as "removable".

4. Means of Egress All temporary portable quarters shall have two unobstructed means of egress. The exits shall not open to a hazardous area.

5. General Alarms All spaces designed for use as berthing or work spaces shall be fitted with adequate general alarm(s) which can be heard or seen throughout the space. The power source shall be part of the emergency power bus.

6. Emergency Lights All spaces which are may designed for use as berthing or work spaces shall be fitted with adequate emergency lighting to mark the egress path to all exits. The power source shall be part of the emergency power bus.

7. Fire Detection All spaces which are designed for use as berthing or work spaces shall be fitted with adequate smoke detection systems.

8. Electrical System(s) All electrical wiring shall meet the requirements found in Subchapter J, Electrical Engineering. For installations of portable quarters in hazardous locations, the marine inspector shall insure the wiring meets the requirements for the explosive atmosphere.

9. Occupancy Installations aboard MODUs may be allowed to house up to six persons. However, OSV installations may house no more than 4 persons.

G. VESSELS OTHER THAN MODU'S ENGAGING IN OCS ACTIVITIES

1. Offshore Supply Vessels (OSV's)

An OSV is defined in 46 U.S.C. 2101(19) as "a motor vessel of more than 15 gross tons but less than 500 gross tons that regularly carries goods, supplies, or equipment in support of exploration, exploitation, or production of offshore mineral or energy resources and is not a small passenger vessel." The application of this definition is not affected by the physical location of the vessel. The word "offshore," as it modifies "supply vessel" has no geographical significance. As long as the vessel in question fits the definition of an OSV, it is considered an OSV and must be inspected as such. "Offshore" is not defined by statute or regulation. Past administrative policy has been to define "offshore" as that water seaward of the coastline (as measured from the mean high water mark). A review of the legislative history of applicable statutes provides no congressional intent to create a regulation-free zone for OSV's when operating "inshore or inland." Additionally, the effective date of Subchapter L allows for the granting of "grandfather" status to previously certified OSVs provided they maintained a COI prior to the effective date of the regulations and they shall continue to receive inspections following the same guidance enforced prior to the effective date of the regulations. The "grandfather" status is forfeit should the vessel change its employment from OSV to another service and undergo major modifications. All vessels currently under construction may continue to meet the grandfather requirements provided they complete construction and receive a COI prior to 16 March 1998.

a. Change of Service. If an inspected OSV surrenders it's COI, or otherwise changes service, certain privileges granted to that class of vessel no longer apply. Tonnage, manning and subdivision are several areas affected. Tankage previously exempted as ballast water spaces for offshore drilling, mining, and related purposes may be included in the new tonnage of the vessel unless otherwise exempted. A review of any ballast exemption in excess of 30 percent of the vessel's gross tonnage, calculated without any allowance for water ballast, is required by 46 CFR 69.03-63(g)(3) and 69.05-9 for the new service of the vessel. In the manning area, the 600 mile voyage, two watch system for OSV's is no longer applicable. With respect to subdivision, the installation of Class 1 watertight doors is restricted outside the offshore oil trade.

b. Delivery of Excess Fuel to Drilling Platforms. Under 46 U.S.C. 3702(b), certain OSV's are permitted to transfer fuel from their own fuel tanks to offshore drilling or production facilities without being inspected and certificated as tank vessels. Specifically, 46 U.S.C. Chapter 37 does not apply to a documented vessel under these circumstances, provided the vessel in question is not more than 500 GT, is not a tanker and is in the service of oil exploration. Subchapter L grants further exceptions to the carriage of flammable and combustible liquids. The allowable amount of flammable or combustible liquids as listed in 46 CFR 30.25-1 may be carried aboard an OSV not to exceed 20 percent of the vessel's deadweight; this rule does not apply to Grade D and E drilling and excess fuel oils when they are carried in integral tanks. The person on board an OSV engaged in this type of operation who is in charge of the transfer operation must be a certified tankerman.

2. Liftboats

Existing liftboats will be inspected initially and subsequently under the provisions of NVIC 8-81, CH1 or NVIC 8-91. 46 CFR Subchapter L, is applicable to new vessels contracted for or delivered after 15 March 1996. As with OSVs, all liftboats which were inspected and certified under the guidance found in NVIC 8-91 prior to the effective date of Subchapter L are granted "grandfather" status and shall continue to receive inspections following the same guidance. The "grandfather" status is forfeit should the vessel change its employment from OSV to another service or undergoes major modifications. All vessels currently under construction may continue to meet the grandfather requirements provided they complete construction and receive a COI prior to 16 March 1998. This information is in no way meant to be all inclusive, nor should it be construed as limiting in any way. Due to a lack of liftboat inspection experience, the sharing of knowledge gained from the initial inspections of liftboats is encouraged to ensure consistent application of inspection procedures.

a. Drydock/Structural Examination. The manner in which this examination will be performed should be very similar to that employed on independent leg jack-up MODU's. It is very likely that the initial exams will be conducted without benefit of approved plans, thus making determination of original scantlings difficult. In general, liftboat scantlings are relatively light due to weight considerations. Therefore, requiring a comprehensive U/T exam of the hull is considered appropriate. Close attention should be paid to plate inserts. Any doublers or spigot patches should be marked for proper insert. Specific welding procedures employed in the construction of these vessels may not be known. Where repairs are required, only current acceptable welding procedures should be employed.

b. Legs, Jackhouses, And Support Structures. These features are extremely critical to the safe operation of liftboats and should receive careful attention during drydock and structural exams. Legs should be sighted to detect any deflection. All significant creases and dents should be marked for insert. Rack and pinion assemblies should be examined for tears, fractures, and broken teeth. Most boats employ a single rack system. Consequently, the side opposite the rack is subject to extreme wear due to rubbing on the jacking guide. Wear-down of as much as 50% of the original scantlings is known to have existed. This area should be subject to U/T examination for the full length of the leg. When original scantlings are determined from approved plans, each leg should be verified as meeting the stated thickness. Some evidence indicates that legs may have been fabricated undersized, despite what was indicated on the builders drawings. Also, legs on existing vessels may have been lengthened after original build and could be considered suspect. It is recommended in this case, that consideration be given to employing x-ray examination of butt welds to verify that full penetration was achieved. The leg to pad connections and condition of the pads themselves are also critical due to the relatively light scantlings for the amount of loading they are subject to. Careful inspection of the footings is critical to insure that they remain watertight. NDT may be necessary to evaluate these connections.

Jacking guide to hull attachments may be subject to tearing problems. Where this is in evidence, retrofit and possible redesign of the weld should be discussed with the owner. Additionally, condition and attachment of headers and supporting structure should be verified. Information about lamellar tearing is available in the Ship Structure Committee Report SSC-290. Copies of this report may be obtained from the Secretary, Ship Structure Committee, (G-MMS)

c. Hydraulic Jacking Systems. Hydraulic system jacking failures have been the source of a number of liftboat casualties. Inspection guidance (NVIC 8-91) provides that systems be modified as necessary to ensure they are fail-safe. There are two types of systems installed on liftboats, known in the vernacular of the industry as open loop or closed loop. Open loop systems are arranged with all the legs supplied in series. Closed loop systems serve each leg individually. Both systems employ a common reservoir. Flow from the reservoir through the pumps to the manifolds is directed by three-way valve controlled from the bridge. The planetary brakes are spring loaded and theoretically, activate when they sense loss of fluid pressure. However, in some previous cases, upon component failure, the brakes did not sense loss of fluid and the vessels fell rapidly. This problem may be remedied in several ways, the most common being the installation of compensating and check valves into the systems. It is the responsibility of the owner to propose an acceptable design. Material condition of the manifolds, hoses, planetaries, couplings, and pinions should be carefully checked as well as system

modifications. Where the systems are tested, physical breaks should be made up stream and downstream of the compensating valves. Additionally, leg controls in the wheel house should be of the "dead man" type only. A number of accidents have occurred because the operators activated a fixed position switch and walked from the consoles.

d. Firemain/Raw Water Suctions. Firemain, bilge, and ballast systems should be capable of operation at all times, including the elevated mode. A portable suction system employing a stated thickness. Some evidence indicates that legs submersible pump and flexible hose may be employed provided system pressure and volume is satisfactory. When practical to do so, the fire main should be tested in the elevated mode.

e. Remainder of Inspection. Other than of the hulls and jacking systems, the remaining machinery, electrical, and piping installations are simple and straight forward, not unlike many small conventional OSV's.

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3. Drilling Tenders

a. Inspection Procedures. Drilling Tenders are vessels which are typically engaged in providing material, power, machinery, manpower and accommodations offshore. Such vessels are normally anchored for several months at a time at an offshore platform. Some of these vessels are self-propelled and some are not. They are inspected and certificated under Subchapter I.

b. Drydocking. These vessels are drydocked according to the regulations in Subchapter I. Special consideration may be given to stern tube and tailshaft bearing extension requests due to recognition of their limited amount of time underway. These requests should be made in writing by the owner, and should be forwarded to (G-MOC), via the district (m) office, together with the recommendation of the OCMI.

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4. Other Foreign Flag Vessels Working on the U.S. OCS

When entering U.S. navigable waters, foreign vessels are subject to Coast Guard inspection to ensure that they provide an acceptable level of safety. Such vessels may be eligible for inspection reciprocity in accordance with the provisions of 46 U.S.C. 3303. If, after reviewing certificates, it is determined that a vessel is not eligible for reciprocity, then an inspection of the vessel should be conducted to determine compliance with the applicable regulations.

The U.S. Customs service has ruled that the carriage of freight or passengers between a point in the United States and a facility on the U.S. OCS is considered Coastwise Trade, and only vessels licensed or otherwise qualified may engage in such activity.

H. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AUTHORITY

In 1979, the Coast Guard and OSHA signed an MOU which gave the agencies joint responsibility for the occupational safety and health of personnel on OCS facilities. In 1983, the two agencies entered into a second MOU which further defined the responsibilities of each agency with respect to Coast Guard certificated vessels. The 1983 MOU designated the Coast Guard as the dominant federal agency second MOU which further defined the responsibilities of statutory authority to prescribe and enforce standards or regulations affecting the occupational safety and health of seamen aboard vessels, including MODUs that are inspected and certificated by the Coast Guard. The MOU further states that OSHA has concluded that it may not enforce the Occupational Safety and Health Act with respect to the working conditions of seamen aboard inspected vessels. OSHA retained, however, the authority over discrimination cases on inspected vessels. A foreign MODU operating under the authority of an LOC issued by the Coast Guard is considered "an inspected and certificated vessel" for the purposes of the 1983 MOU with OSHA.

I. BOUNDARY LINE REGULATIONS.

1. June 1985 Change

In June 1985, a change to the Boundary Line regulations moved the Boundary Line out to the seaward limit of the contiguous zone (12-mile line) along the Gulf Coast. In most other areas of the country the boundary line remains at the headlands. Refer to 46 CFR 7 for specific areas. The Boundary Line is used to determine the applicability of the following statutes.

a. 46 U.S.C. 3301(6) and (7) require inspection of seagoing barges and motor vessels whose definitions in 46 U.S.C. 2101(32) and (33) rely on the use of the Boundary Line.

b. The Coastwise Loadline Act (46 U.S.C. 88 and 46 U.S.C. 5102) applies to merchant vessels of 150 gross tons over and over, engaged in coastwise voyages by sea and passing outside the boundary line.

c. 46 U.S.C. 8304 limits the application of the Officers Competency Certificates Convention, Geneva, 1936 to the high seas which are defined as "seaward of the Boundary Line."

d. The Vessel Bridge-to-Bridge Radiotelephone Act (33 U.S.C. 1201 et. seq.) requires the carriage of radiotelephones on board certain vessels inside the Boundary Lines on the navigable waters of the U.S.

e. 46 U.S.C. 3302(d) exempts certain vessels that operate inside the Boundary Line within the waters of southeastern Alaska and the State of Washington from inspection requirements.

2. Effect of Change on Deck Cargo Barges

The practical effect of the Boundary Line changes in the Gulf region is that deck cargo barges, dredges, etc. are permitted to operate out to the 12 mile line without loadlines and without inspection.

3. Effect on Other Vessels

The changes to the Boundary Line regulations did not affect the applicability of the inspection statutes for the other vessel types listed in 46 U.S.C. 3301. Additionally, it did not amend the regulatory definition of a Lakes, Bays and Sounds (LBS) route or a Coastwise (CW) route. When the 46 CFR Subchapter D regulatory definitions for LBS and CW routes (46 CFR 30.10-11 and -41) are considered, it is clear that the Boundary Line should not be used in the Gulf as the demarcation line between these two routes. If an inspected vessel operates in the 12 mile area inside the Boundary Line, it must comply with the stated thickness. Some evidence indicates that legs regulatory requirements for a CW route. Thus, a tank barge operating solely inside the Boundary Line but outside the traditional LBS route, would need to meet the safety and structural requirements for a CW route. The vessel would need a CW route endorsement on the COI, however it would not need a loadline certificate.

4. Effect On Pollution Standards

Additionally, the pollution prevention standards of 33 CFR Subchapter O are applicable to all vessels operating beyond three miles from land (33 CFR 151.03(a)).

J. CONFINED SPACE ENTRY

Confined space entry is discussed in Chapter 5 of this manual. Regulations require that prior to entering confined spaces, the atmosphere must be tested for oxygen and toxic vapor content. Entry into spud cans or mat tanks on MODU's can be extremely hazardous because of the potential for Hydrogen Sulfide, a deadly gas even in low concentration. Inspections overseas present unique problems in that NFPA Marine Chemists are not available to certify spaces. When no Marine Chemist or other authorized person designated by the OCMI is available, the inspection should be made by the senior vessel officer present. When none of the vessel's officers are present, as in the case of most vessels in foreign shipyards, the inspector must be extremely cautious. NO CONFINED SPACE SHALL BE ENTERED UNLESS IT HAS BEEN SATISFACTORILY TESTED. It is the responsibility of the owner to make his vessel available for inspection and this includes insuring safe atmospheres to permit internal inspections. While almost all foreign yards employ persons to inspect and certify conditions in and adjacent to those undergoing repair, their level of expertise varies widely. In this environment, marine inspectors must be provided the training and equipment which will allow them to make independent decisions on confined space entry.

OCMI's should be keenly aware of the unique hazards which their inspectors face when working overseas and endeavor to ensure adequate training is afforded personnel working in this environment.

K. RUPTURE DISCS

Pressure Vessels are discussed in section 18.E.1. The Commandant may authorized the use of rupture discs on certain pressure vessels containing substances which might adversely affect the operation of relief valves or where installing a valve is considered impractical (46 CFR 54.15-13). This authority is delegated to district (m) offices, and may be re-delegated to OCMIs in their respective zones, in the following circumstances for MODUs and OSVs:

1. Rupture Disks In Lieu of Relief Valves

a. Rupture discs may replace relief valves in non-vital systems involving high pressure motion compensation air, bulk material handling, and service or rig air, provided the rupture discs meet 46 CFR 54.15-13.

b. Rupture discs may not replace relief valves in systems associated with the safety or operation of vital machinery (e.g., starting air, control air, etc.).

2. Venting Requirements

Due to the complete release of pressure when a rupture disc bursts, venting may have to be installed to limit the exposure of personnel and or machinery to the contents of the affected pressure vessels (e.g., P tanks containing barite).

3. Burst Pressure Issues and Relationships

The following information is provided concerning the relationship between the burst pressure of a rupture disc and pressures of the pressure vessel it is protecting:

a. Pressure relieving devices for pressure vessels must meet the requirements of ASME Code as limited or modified by 46 CFR Part 54.

b. A single rupture disc installed to protect a pressure vessel against excessive pressure increases must have a nominal burst pressure no greater than the maximum allowable working pressure (MAWP), provided no other pressure relieving devices are installed. The size of the rupture disc must be as such as to prevent the pressure from rising more than 10 percent above MAWP except when the excess pressure is caused by exposure to fire or other unexpected source of heat. Under fire conditions, the size of the rupture disc must prevent the pressure from rising more than 20 percent above MAWP.

c. A rupture disc installed solely to prevent the pressure from rising more than 20 percent above MAWP under fire conditions must have a nominal burst pressure no greater than 110 percent of MAWP. In this case, another relieving device with a set pressure not greater than MAWP must be sized and installed to prevent the pressure from rising more than 10 percent above 10 percent MAWP. This relieving device must be installed between the pressure vessel and the source of external pressure, such as an air compressor.

d. Since rupture discs are susceptible to fatigue failure, our regulations, 46 CFR 54.15-13(b)(3), require the rupture disc setting to be 1.3 times the normal maximum operating pressure. The normal maximum operating pressure is the maximum pressure applied to the pressure vessel under normal service or operating conditions. The operating pressure may rise above this pressure on an infrequent basis and under anticipated but unusual circumstances. These pressure increases above the normal maximum operating pressure must be below the MAWP and be so infrequent as to not cause fatigue failure of the disc. Based upon this requirement, when only a single rupture disc is installed as the primary maximum operation pressure must be no greater than MAWP divided by 1.3, provided the normal burst pressure of the rupture disc is equal to the MAWP. If the rupture disc's nominal burst pressure is less than MAWP, then the normal operating pressure must be no greater than the rupture disc's nominal burst pressure divided by 1.3. Equation (1) illustrates this relationship between the pressure vessel's normal maximum operating pressure (MOP), the nominal disc burst pressure (BP), and the maximum allowable working pressure (MAWP) of the pressure vessel.

(Equation 1) $1.3 \times MOP < BP < MAWP$

When the rupture disc is installed to protect the pressure vessel under fire conditions, the normal maximum operating pressure must be no greater than the nominal disc burst pressure divided by 1.3 and the nominal disc burst pressure must be no greater than 110 percent of MAWP. Equation (2) illustrates this relationship between the various pressures.

(Equation 1) $1.3 \times MOP < BP < 1.10 \times MAWP$

L. REGULATIONS PERTAINING TO INSPECTION OF FIXED OFFSHORE FACILITIES

1. 43 U.S.C. 1333 The U.S. Code requires the Coast Guard to conduct annual inspections of OCS facilities.

2. Applicability of Regulations The regulations found in 33 CFR Subchapter N are applicable to all OCS fixed facilities operating outside of state waters. All fixed facilities shall be marked in accordance with the regulations found in 33 CFR Part 67.

Background: The Outer Continental Shelf Lands Act as amended directs the Coast Guard and MMS to conduct initial and annual inspections of OCS facilities. The annual inspection may be in the form of scheduled and unannounced inspections. This inspection requirement is further modified by 33 CFR 140, requiring the Coast Guard to conduct initial inspections and allowing the owner/operator of the facility to conduct annual self inspections. An MOU with MMS further delineates Coast Guard inspection and plan review responsibilities.

OCMIs are encouraged to develop partnerships with regional MMS personnel to achieve the following:

a. Develop lines of communication for information exchange.

b. Accompany MMS inspectors on a space available basis.

c. Develop a targeting strategy for OCS facilities.

M. INSPECTION STANDARDS FOR FIXED OFFSHORE FACILITIES OR PLATFORMS

1. District Commander The District Commander (oan) shall provide notice to the appropriate field unit within 30 days of receipt of notification by an owner/operator of the installation of new OCS facility.

> **NOTE**: A change in ownership of the facility does not constitute re-designation of the platform as a "New" facility thus requiring an initial inspection.

2. OCMI

a. OCMIs shall ensure initial inspections are conducted on all newly constructed OCS facilities within 45 days of receiving notification from the District Commander (oan).

b. The OCMI shall conduct inspections on a minimum of 20 percent of the offshore facilities annually. The facilities targeted for inspection may be selected according to the risk associated with the OCS facility, and its past history of self inspections.

c. All deficiencies noted during inspection activities shall be documented in MSIS. The owner/operator will receive written notification of each uncorrected deficiency. In most cases the period to correct the deficiency shall not exceed 30 days.

d. The OCMI shall provide oversight of the streamlined inspection program. All deficiencies noted on a Form CG-5432 by an owner/operator of an OCS facility during a self inspection shall be documented in MSIS. Additionally, all uncorrected deficiencies noted by the owner/operator of the facility shall be given a period of not more than 30 days from the date of receipt of the completed CG-5432 by the OCMI to correct all noted deficiencies.

e. The OCMI shall exchange information with the regional MMS office to avoid duplicative inspection efforts.

f. Violation cases shall be initiated against the owner/operator in two instances:

(1) A deficiency is discovered of such a serious nature as to be immediately dangerous to life and health of the workers. In keeping with MSM Volume I, Chapter 11, the OCMI shall notify the MMS regional office when conditions of significant hazard are present on an OCS facility.

(2) If the "reasonable period" of thirty days have elapsed and a deficiency or deficiencies have not been corrected by the facility owner/operator without receiving a written extension from the cognizant OCMI.

N. LIFESAVING EQUIPMENT ON UNMANNED FIXED PLATFORMS

33 CFR 141.10 does not specifically require that lifesaving equipment be available on an unmanned platform at all times, only when personnel are on the platform. It is burdensome to require PFD's and Ring Buoys when only one person is working aboard a fixed platform. In this situation, the following equivalency applies:

- A person wearing the following Coast Guard approved Type I PFD approval numbers:
  - ➔ *46 CFR 160.002, 160.005 or 160.055*, or
- Type V PFD approval numbers:
  - ➔ *46 CFR 160.053, 160.055 or 160.077* (commercial hybrid)

shall be considered in compliance with paragraphs (a)(1) and (2) of 33 CFR 141.10.

O. PORTABLE TEMPORARY QUARTERS

There is a growing increase in the use of portable living quarters aboard fixed Offshore Facilities. The mobile nature of this item warrants closer Coast Guard scrutiny. The Coast Guard does not conduct plan review of portable crew shelters for exclusive use on fixed platforms. The exception to this policy is any portable shelter installation aboard any fixed OCS facility maintaining a Coast Guard Certificate Of Inspection. Currently there are no regulations in place governing the construction standards for these shelters. Until such time when regulations are promulgated this policy shall remain enforce.

1. Construction

All temporary portable shelters which receive a Coast Guard inspection shall be constructed to meet "A-60" structural fire protection standards.

2. Plan Review

The plan review may be conducted locally for steel construction. Plan review for all other construction using alternative materials shall be conducted by the Marine Safety Center.

3. Means of Securing

Upon approval of the plans for the portable quarters, a review of the proposed installation must be completed. The following items must be addressed within the proposal and examined carefully by the marine inspector:

a. Copy of the approval letter for the quarters unit.

b. Physical location of the portable quarters aboard the facility, including deck strength calculations.

c. Securing arrangements.

(1) Chains or nylon straps may be used to secure a temporary portable quarter to the deck of a platform. The chains shall be examined for excessive wear. No more than 25 percent wear is permitted on the chain links. Nylon straps shall be examined for pulls, chaffing and frays.

(2) Container pedestals shall be welded to the platform's deck. The marine inspector shall insure approved welders and procedures are employed. The use of NDT to ensure full penetration of the weld was achieved.

d. Location of openings. Openings shall be so located as to eliminate crew exposure to hazards associated with the facility's operations and sewage gases. The proposal may be forwarded to the Marine Safety Center for plan review if additional plan review is warranted by the OCMI.

P. PROCESSING OF VIOLATION CASES

Violation cases shall be processed in accordance with the procedures found in MSM Volume V, Chapter 8. All suspected violations discovered during Coast Guard inspection activities or through other means shall be thoroughly investigated by the Coast Guard following the guidance in 33 CFR, Subpart 1.07 and MSM Volume V, Chapter 8. The following amplifying information shall be strictly adhered to:

1. Investigating Officer

The Investigating Officer shall prepare the violation case following the procedures in as set forth in 33 CFR, Subpart 1.07 and MSM Volume V, Chapter 8. It is paramount that all suspected violations are investigated and sufficiently documented to prove a prima facie case.

2. District Commander Processing

Completed violation cases investigated by the Coast Guard shall be processed via the District Commander (m) in accordance with the procedures found in 33 CFR, Subpart 1.07. The District Commander (m), shall review each case, make a determination that a prima facie case exists and forward a completed case upon to the MMS regional office vice the Hearing Officer for their action. If the evidence is insufficient to prove a prima facie case, the case may be returned to the field unit for further action or closed to file.

3. Forwarding for Prosecution

The District Commander (m) upon review of the case, may determine that a criminal case exists against the owner/operator of an OCS facility. In this instance, the case shall be forwarded to the Attorney General's office for prosecution. If the Attorney General's office refuses the case, it will then be forwarded to MMS for civil penalty action.

- The Coast Guard, when requested by regional MMS office, shall provide a representative (usually the Investigating Officer) familiar with the violation case for presentation.
- All enforcement actions shall be coordinated with regional MMS offices to avoid redundant efforts.

Q. POLLUTION

1. Oil Pollution

➔ See MSM II-B8.C.19.

2. MARPOL V Requirements

MARPOL V requirements are applicable to Fixed Offshore Facilities. The discharge of any garbage by a fixed OCS facility within 12 miles of land is strictly prohibited. However, fixed facilities beyond 12 miles from land are allowed to dispose of food wastes provided they are ground and can pass through a screen with openings no larger than 1 square inch (25 mm).

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A. INSTRUCTION

46 U.S.C. Chapter 33 requires that certain vessels possess a Certificate of Inspection (COI). Owners of U.S. vessels may receive a COI by one of three means:

- The traditional means of having a Coast Guard Marine Inspector conduct an examination,
- Participation in the Streamlined Inspection Program (SIP), or
- Participation in the Alternate Compliance Program (ACP).

ACP maintains existing levels of safety while eliminating duplicative plan review and inspection tasks which were traditionally conducted by both the classification society and the Coast Guard. Owners of certain U.S. tank vessels, passenger vessels, freight vessels, miscellaneous vessels and mobile offshore drilling units (MODUs) can elect to participate in the ACP as an alternative method for vessel design, inspection and certification. U.S. and foreign classification societies may be designated as an ACP Class Society" (see Definitions below).

NOTE: To date, Passenger Vessels Statutory Inspections have not been delegated to a classification society.

B. AUTHORITY

46 U.S.C. 3316 allows the Coast Guard to delegate certain plan review, new construction, and periodic inspection tasks of U.S. merchant vessels to the American Bureau of Shipping or a similar United States classification society. The Coast Guard Authorization Act of 1996 (Public Law 104-B94) amended 46 U.S.C. 3316 to allow the Coast Guard to delegate these tasks to foreign classification societies, which could ultimately lead to participation of foreign class societies in the ACP.

C. DEFINITIONS

The following definitions are provided:

1. ACP Officer

The person tasked by the OCMI with the routine coordination and administration of the ACP at the local Coast Guard field unit. The duties of the ACP Officer include maintaining contact with the local classification society Surveyor-in-charge and field Surveyors, participating vessel owners, operators and their designated representatives, and other relevant parties to verify that delegated activities are being performed at the intervals and in the manner prescribed by the terms of the ACP.

2. ABSLO

The Coast Guard's Liaison Officer to the American Bureau of Shipping (ABS)

3. Authorized Classification Society

A recognized classification society that has been delegated the authority to conduct certain functions and certifications on US flagged vessels on behalf of the Coast Guard.

4. ACP Class Society

A Classification Society to which the Coast Guard has authorized to participate in the Alternate Compliance Program. A classification society may receive ACP authorization from Commandant (G-M) after satisfactorily performing prescribed functions for at least two years.

5. Class Rules

The standards developed and published by a classification society for the design, construction and certification of commercial vessels.

6. Classification Society's ACP Coordinator

The individual appointed by a classification society to act as a central point of contact for matters involving ACP and functions delegated by the Coast Guard (See NVIC 2- 95 for a list).

7. Delegated Function

A function related to Coast Guard commercial vessel inspection program which has been delegated to a classification society. Delegated functions may include issuance of international convention certificates and/or examinations necessary to participate in the Alternate Compliance Program.

8. Participating Vessel

A vessel that is enrolled in the ACP, and that complies with an authorized society's class Rules, its U.S. supplement, and applicable international maritime safety and pollution prevention treaty regulations. Participating vessels must:

a. Have a COI, and

b. Be “classed" by an ACP Class Society (generally, a valid certificate for hull and machinery issued by the Class Society is evidence that a vessel is “classed"), and

c. Have valid international certificates.

NOTE: For new construction, the Program Manager may enroll vessels into ACP while they are in the process of obtaining all of the above.

9. Program Manager

Coast Guard Headquarters, Office of Compliance (G-MOC) is the Program Manager. The Program Manager is tasked with coordinating the activities of cognizant OCMIs, arranging certain oversight activities, and ensuring overall administration of the ACP.

10. Recognized Classification Society

A classification society recognized by the Coast Guard as having met minimum standards for general characteristics and performance of a classification society. (Achieving the status of recognized classification society will not, in of itself, indicate any specific delegation of authority.)

11. Streamlined Inspection Program (SIP)

SIP provides another alternative method for owners and operators to comply with Coast Guard inspection requirements. ACP and SIP are entirely separate and independent programs. OCMI's and ACP Class Societies will accept no SIP work on ships enrolled in ACP. (See “ Vessel Disenrollment" discussed later in this chapter.)

NOTE: See MSM II, Sec. B, Ch. 10 on The Streamlined Inspection Program (SIP), and NVIC 2-99 for complete information on SIP implementation. Also, information on SIP can be accessed from the SIP Website at: http://www.uscg.mil/hq/g-m/sip/siphome.htm

D. ACP CLASSIFICATION SOCIETY

An ACP Classification Society must first be “recognized", then it must perform certain delegated functions satisfactorily for at least two years before G-M may approve a Class Society for ACP delegation. The Coast Guard will enter into a written agreement with a recognized classification society to issue certain international certificates on its behalf. The agreement, typically a memorandum of understanding (MOU), gives the details of the extent of the delegated functions. It describes the duties, responsibilities and performance expectations for the Coast Guard and the classification society. A list of ACP Classification Societies may be found in NVIC 2-95.

1. U.S. Supplement

Prior to receiving delegation authority necessary to participate in the ACP, the classification society must develop its U.S. supplement or other document which incorporates specific Coast Guard requirements in addition in its class Rules. These requirements include all regulations applicable for issuance of a COI that are not addressed by either the class Rules of that classification society or by applicable international regulations. G-MSE is the approving authority for each U.S. supplement. Development of a U.S. supplement for each ACP Class Society ensures that the class Rules when combined with standards in applicable international conventions, provide a level of safety standards equivalent to traditional Coast Guard regulatory requirements.

A supplement to the ABS Rules was developed to address those areas in which current Coast Guard requirements were not covered in the ABS Rules, by standards in applicable international conventions, or in areas in international conventions that require interpretation by the flag administration.

As a general rule for ACP ships, the frequency of survey intervals will be the same as the classification society's intervals for items such as inspection of pressure vessels, stern tube lube oil analysis, boiler safety valves, fuel tank internals, water tube boiler hydrostatic tests, and sea valves.

2. International Certificates

A Classification Society may be delegated the authority to issue the following international convention certificates on behalf of the Coast Guard:

a. International Load Line Certificate

b. International Tonnage Certificate

c. SOLAS Cargo Ship Safety Construction Certificate

d. SOLAS Cargo Ship Safety Equipment Certificate

e. SOLAS Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk

f. SOLAS Certificate of fitness for the Carriage of Liquefied Gasses in Bulk

g. SOLAS Mobile Offshore Drilling Unit Safety Certificate

h. MARPOL 73/78 International Oil Pollution Prevention Certificates under annexes as follows:

MARPOL ANNEX	ANNEX FULL TITLE	ACP STATUS
Annex I	Regulations for the Prevention of Pollution by Oil	Full Authorization
Annex II	Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk	Full Authorization
Annex III	Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form	Full Authorization
Annex IV	Regulations for the Prevention of Pollution by Sewage from Ships	*see **NOTE** below*
Annex V	Regulations for the Prevention of Pollution by Garbage from Ships	Full Authorization
Annex VI	Regulations for the Prevention of Air Pollution from Ships	Not In Force

NOTE: The USCG has not endorsed ANNEX IV, however the USCG expects compliance with the Marine Sanitation Device regulations in 33 CFR, Part 159

i. MARPOL 73/78 International Oil Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk

j. ISM Document of Compliance

3. Class Society Involvement with Failures of Automation Casualties and Certificate Revocation

The vessel's Master has the responsibility for preparing and submitting the form CG-2692. Class Surveyors will obtain a copy of the form CG-2692 from the Master. The Surveyor will verify the reportable casualties noted during the course of a survey and forward it to the local OCMI for disposition. Surveyors will also notify the OCMI if a vessel fails to comply with automation test procedures as manning levels are affected. Refer to 46 CFR 62.50 for requirements.

Class Surveyors will make recommendations to the OCMI to revoke/rescind international certificates for no sail items" which relate to lifesaving, fire fighting, watertight integrity, and pollution prevention. (Refer to “Control Actions and Detentions" which are discussed later in this chapter).

E. INSPECTION ACTIVITIES RETAINED BY THE COAST GUARD

The Coast Guard retains the authority for the following marine inspection activities:

- All manning issues;
- Dry-dock interval extensions beyond 90 days,
- Approval of a vessel's participation in the underwater survey in lieu of dry-docking (UWILD) program (see NVIC 2-95);
- Permits to proceed;
- Load line exemptions;
- Excursion permits;
- Changes of employment; and
- Critical Area Inspection Plan (CAIP) enrollment and exams.

F. VESSEL ENROLLMENT

The ACP is a voluntary alternative compliance method available to the U.S. maritime industry (see Definitions for Participating Vessel). A vessel owner or operator wishing to have a vessel inspected under the ACP may apply by submitting an Application for Inspection of U.S. Vessel (CG-3752) to the cognizant OCMI. The form must indicate the owner's desire to have a vessel become a participating vessel and the name of the ACP Class Society.

The typical sequence of steps for enrollment:

1. Application Vessel owner or operator applies (using CG-3752) to the cognizant OCMI to become a participating vessel.

2. Eligibility & Data Transfer Once the OCMI determines that the vessel meets the Participating Vessel criteria, a copy of the vessel's MSIS record (MICOI, MICP, MIPIP product sets) and a copy of the CG-3752 is sent to the ACP Class Society Coordinator.

3. Processing The ACP Class Society Coordinator enters the appropriate MSIS details into the vessel's class computer record, especially pending CG-835s and inspection notes. When the computer details are correct, arrangements will be made for the Hand-Over Survey.

4. Hand-Over Survey The Hand-Over Survey will be jointly conducted by the ACP Class Surveyor and a CG Inspector. The survey will consist of the Mandatory Annual Survey required for the Cargo Ship Safety Construction (SLC), the Cargo Ship Safety Equipment Certificate (SLE) and the International Oil Pollution Prevention (IOPP) Certificate. Certificates due for renewal or annual class surveys will be completed as part of the Hand-Over Survey. USCG-issued SLE and MARPOL certificates with a remaining validity of more than 15 months may be retained by the vessel after the Hand-Over Survey, and the class society will be authorized to endorse the certificates at the next annual survey. Other certificates that are valid for less than five (5) months validity at the time of the Hand-Over Survey must be renewed as part of the Hand-Over survey. It is expected that the owner's representative will try to schedule the Hand-Over Survey at a time that harmonizes with the vessel's window of surveys. The Inspector and the Surveyor shall co-sign or endorse any certificates on board with the exception of the COI, which is signed, issued and endorsed only by the Coast Guard. After completion of a successful Hand-Over Survey, the OCMI notifies G-MOC and makes a positive or negative recommendation regarding the vessel's enrollment in the ACP.

5. Notification of Enrollment

G-MOC notifies the vessel's owner by letter (with a copy to the Class Society's ACP Coordinator and the OCMI) of the vessel's enrollment into the ACP. (See MSIS entries noted later in this chapter.)

G. VESSEL DISENROLLMENT

1. Involuntary Disenrollment

The Program Manager (G-MOC) shall consider a participating vessel for disenrollment after being notified of or receiving one or more of the following:

- Two or more detentions reported to the Program Manager by the OCMI over the course of one year.
- A recommendation of disenrollment from the Quality Assurance/Traveling Inspection Staff (G-MO-1) after an oversight visit.
- A recommendation of disenrollment from the OCMI with supporting documentation.
- Notification of removal of the participating vessel from Class.
- A recommendation from the ACP Class Society to disenroll the vessel.

2. Voluntary Disenrollment

The vessel owner may request disenrollment from ACP during the anniversary window period of the COI issue date. The owner will submit an Application for Inspection of U.S. Vessel (CG-3752) to the cognizant OCMI that indicates the request to disenroll the vessel from the ACP.

3. Eligibility of Disenrolled Vessels for SIP or Re-enrolling in ACP

Vessels that are disenrolled from the ACP at the owners request, may not request to enroll in the SIP or renewal in the ACP until the next anniversary date of the COI's issue.

Vessels that are disenrolled from the ACP by the Coast Guard (for cause) may not request to enroll in the SIP or to reenroll in the ACP for a period of three years or until after the next dry-docking, whichever is longer.

4. Disenrollment Inspection

Vessels being disenrolled from the ACP will be inspected for certification by a Coast Guard Marine Inspector with an invitation given to the ACP Class Society Surveyor to attend. Upon disenrollment, the OCMI shall ensure that all MSIS inspection dates are restored and that the Program Manager is promptly notified. The vessel will then become subject to subsequent inspections and examinations as required by applicable provisions of Coast Guard regulations and Coast Guard publications and directives.

H. CERTIFICATE OF INSPECTION

1. Class Society's Inspection

The ACP Classification Society will conduct certain activities (surveys, tests, inspections and examinations) on a vessel and document its compliance with applicable international requirements, the classification society's class Rules, and the U.S. supplement.

2. Coast Guard Inspection and Authority

The Coast Guard's examination (See sections entitled "The Annual Examination" (B9.J.1), and "The Reexamination" (B9.J.2)) will consist of those activities that have not been delegated to the classification society under the ACP (e.g., witnessing drills and assessing crew proficiency in handling shipboard emergencies).

USCG Administrative Review

a. The cognizant OCMI will conduct an administrative review of the reports of activities performed by the classification society, and then follow-up this review with a vessel examination. The administrative review of reports and international certificates will determine if vessel equipment, components, and systems were examined at appropriate intervals using proper procedures.

USCG Authority

b. The Coast Guard remains the final authority for the issuance or revocation of a COI. The ACP Class Society may not endorse or issue the COI. The classification society's Surveyor must notify the local OCMI if conditions exist that require revocation of the COI. Detailed procedures for issuing COIs under the ACP are contained in NVIC 2-95.

I. COAST GUARD RESPONSIBILITIES

1. Cognizant OCMI

General responsibilities of the cognizant OCMI under the ACP are to:

- Ensure that equivalent levels of safety are maintained on participating vessels as compared to vessels that undergo traditional Coast Guard inspections;
- Arrange for completion of the required Hand-Over survey upon application for enrollment into the ACP;
- Conduct prescribed oversight examinations on participating vessels;
- Issue the COI to participating vessels;
- Take necessary control action (including detention) of substandard vessels;
- Make recommendations to G-MO-1 for oversight attendance by the Traveling Inspection Staff; and
- Make recommendations to G-MOC for vessel disenrollment.

2. ACP Officer

ACP officers are Coast Guard Marine Inspectors designated by the OCMI. They should have the qualifications and level of experience necessary to accurately review the reports of activities submitted by the ACP classification society and be able to determine whether or not the participating vessel is in substantial compliance with applicable laws and regulations. ACP officers will be familiar with the applicable class Rules and its U.S. supplement, and the international regulations applicable to the participating vessel. The ACP officer should be well versed in the oversight program.

3. Program Manager

The Program Manager (G-MOC) is responsible for overall administration and management of the ACP. G-MOC will ensure that an appropriate number of staff members are adequately trained in auditing techniques and ACP Classification Society processes in order to properly conduct ACP Classification Society Quality Audits.

G-MOC will:

a. Review each ACP classification society's process instructions, survey procedures, and checklists.

b. Coordinate with G-MSE in reviewing changes to the Classification Society's Rules, SOLAS, MARPOL, other international conventions, and ACP MOUs to ensure that proper changes are made to the U.S. supplement.

c. Enroll new vessels into ACP.

NOTE: Commandant (G-MSE) has the primary responsibility for the standards contained in a Class Society's U.S. Supplement.

4. ABSLO

Beyond providing coordination between the ABS and the Coast Guard, the ABSLO has primary responsibility for observing ABS Quality Audits, reviewing approximately ten percent of the ABS ACP Survey Records, and tracking corrective action initiated during Coast Guard program oversight.

5. Quality Assurance & Traveling Inspection Staff (G-MO-1)

G-MO-1 is responsible for performing oversight exams as noted later in this chapter.

6. The Marine Safety Center (MSC)

Performs ACP plan review oversight as noted later in this chapter.

J. ACP OVERSIGHT

Oversight is intended to ensure that participating vessels are consistently designed, built, operated and maintained to a level of safety that is equivalent to vessels certified under the Coast Guard's traditional inspection program.

1. The Annual Examination

Every ACP ship shall have an annual examination conducted by the Coast Guard to coincide with COI or reinspection dates. An annual examination will be documented in, and follow the general procedures and scope outlined by, the passenger, tank, or freight vessel examination books located in chapters 20, 21 and 22 of this volume. It should include, but is not limited to:

a. Examination of the vessel's certificates, licenses and documents,

b. General examination (i.e., "walk-through") of the vessel, and

c. Examination and testing of specific equipment, and conducting of operational testing and emergency drills to ensure the crew's proficiency at carrying out critical tasks.

The annual examination shall not normally duplicate those items checked by the classification society unless there are “clear grounds" to expand the examination. Annual examinations provide the OCMI with first-hand assessments of the inspection items delegated to the ACP Class Society, and ensure that these items conform with applicable requirements.

> **NOTE:** “Clear grounds" means evidence that the ship, its equipment, or its crew do not comply substantially to the requirements of the relevant conventions, Rules, and U.S. supplement, or that the Master or crew members are not familiar with essential shipboard procedures relating to the safety of ships or the prevention of pollution.

The OCMI must request copies of the ACP Class Society's computer printouts (or have dial-up computer access to the ACP Class Society's vessel files) and/or Survey check sheets to ensure that all required surveys are current prior to issuing or endorsing the COI at the annual examination. Obtaining these printouts in advance (i.e., upon vessel’s application or notification for inspection) is highly recommended to allow for a thorough review by the ACP officer prior to vessel boarding. The ACP Officer shall work closely with the local Class Surveyor's office to clarify the current Status of surveys, and to ensure that outstanding class recommendations or conditions of class are properly addressed.

2. The Reexamination

A reexamination is an examination by the Coast Guard to ensure that a vessel and its crew have remained in compliance with appropriate U.S. laws and applicable international conventions between annual examinations. It shall normally consist of an examination of the vessel's certificates, licenses and documents, and a general examination conducted by walking through the vessel. Except for passenger vessels, for which quarterly reexaminations are mandatory, a reexamination will not normally include operational testing or drills. A reexamination may be expanded as necessary if clear grounds exist to indicate that a vessel is not in compliance with applicable U.S. laws or international conventions. A reexamination will be documented in, and follow the general procedures and scope as outlined in the passenger, tank, or freight vessel examination books located in chapters 20, 21 and 22 of this volume respectively.

> **NOTE:** See Figure B9-1. Refer to the ACP Reexamination Matrix, which provides the method for determining reexamination priorities based on vessel owner, boarding history and vessel type. OCMIs in Europe and Asia shall base ACP oversight reexaminations upon funding levels without using the matrix. Generally, overseas reexaminations should occur on 10 percent of participating vessels annually.

3. Vessel in Dry-dock, at Dock, or UWILD Oversight Examinations

Coast Guard Headquarters, Quality Assurance/Traveling Inspection Staff (G-MO-1) shall examine about 10 percent of ACP vessels in this category. The OCMI shall be invited to attend the examination. The OCMI may make recommendations to G-M0C, regarding which ACP vessels should be considered for visits by the traveling inspection staff. The oversight examination is conducted by G-MO-1 to ensure that:

a. ACP Check sheets are being used by the ACP Class Society,

b. ACP vessels are held to safety levels that are equivalent to those vessels undergoing the traditional Coast Guard inspection, and

c. ACP Class Surveyors have been adequately trained to conduct surveys on behalf of the Coast Guard.

4. New Construction, Damage Surveys and Major Modifications

Approximately 10 percent of these surveys that occur in an OCMI's zone will be subject to direct Coast Guard oversight. The OCMI shall:

a. Determine the scope of the oversight.

b. Meet with the ACP classification society's Surveyor- in-charge and vessel's owner to develop a mutually acceptable oversight schedule.

c. Check the primary lifesaving equipment that must be approved by the Coast Guard (Refer to 46 CFR Subchapter W and the ACP Class Societies' U.S. Supplement on equipment approval.)

5. Underwater Survey in Lieu of Dry-docking (UWILD)

➔ See NVIC 2-95 (CH-1).

6. Plan Review and Associated Oversight

In support of the oversight process, each ACP Classification Society will, as a minimum, provide the Marine Safety Center (MSC) with a monthly list of plans for which review has been completed as part of the ACP and inform the MSC regarding upcoming new construction or major modification plan review activity for participating vessels.

a. The MSC has established a plan review oversight process with the classification societies that have been delegated plan review authority on behalf of the Coast Guard. The oversight process includes completion of written agreements with the classification societies on handling of plans, identification of areas of nonconformance, and corrective actions. The CO, MSC, is responsible for ensuring adequate oversight of plan review activities and for reporting discrepancies and problems to G-MOC as appropriate.

b. The Commanding Officer, MSC, may attend any ACP classification society's quality system activities involving plan review functions on vessels enrolled in the ACP.

c. The MSC may determine, based on documented non conformities discovered during routine plan review oversight, or through documented non-conformities reported by OCMIs, that a potential process failure exists. When such a determination is made, the MSC may arrange an oversight visit with the classification society Engineering Manager. The Engineering Manager shall be informed of the specific non-conformities that have been detected, and of any other information that may aid in developing an effective oversight visit. After completing the plan review oversight visit, the MSC shall report the results to G-MOC. The report should include a description of the situation and corrective action taken by the ACP classification society.

7. ACP Classification Society Quality Audits

Coast Guard representatives with Quality Systems Auditor training (ABSLO or G-MO staff) annually will observe about 10 percent of the internal and external audits conducted at the ACP Class Society's Corporate or local offices. Quality Audits include a Vessel Records Audit that may be performed at the request of an OCMI by the Program Manager or the ABSLO to follow-up on serious conditions of class or noteworthy non-conformities observed during vessel oversight examinations.

The audits ensure that:

- Quality standards and procedures are in place and followed,
- Quality records are available and up-to-date, and
- Corrective actions are taken on non-conformities.

K. DEFICIENCIES AND REPORTING

1. CG Form 835

The OCMI may issue "835s" on ACP ships in the same manner as a ship inspected under the Coast Guard's traditional inspection program. The issuance of an 835 should be a last resort for vessels enrolled in ACP. Efforts must be made to have the class society Surveyor attend the vessel to concur in the corrective action necessary and to generate an Outstanding Recommendation (OSR) or Condition of Class. The 835 shall not duplicate class deficiencies. ACP Class Surveyors may "clear" 835 items by drawing a line through the item, endorsing it as cleared and forwarding a copy to the local OCMI. ACP Class Surveyors may extend or modify outstanding 835s with the concurrence of the issuing OCMI.

2. Control Actions and Detentions

When, in the opinion of the OCMI, an ACP ship is unsafe to proceed to sea, and/or when it poses a serious threat to life, property or the marine environment, appropriate control actions shall be taken, which may include removing the COI and detaining the ship in accordance with SOLAS, Regulation 6 and MARPOL, Article 6. (Refer to "Detention Criteria" and "Reporting Obligations" as outlined in chapter 24 of this volume.)

3. Reporting of Marine Casualties

Participants in ACP are still required to report marine casualties in accordance with 46 CFR Part 4.

L. MSIS ENTRIES

1. MSIS Inspection Report Entries

a. Upon completion of a satisfactory Hand-Over Survey, the OCMI shall notify the Program Manager (G-MOC) preferably by confirmed fax, recommending that the vessel be enrolled in the ACP. G-MOC shall also be notified of an unsatisfactory Hand-Over Survey.

b. Upon acceptance of the vessel into the ACP, G-MOC shall update MSIS (product set -VFSC) with the following Special Class Code: eCACvon9. (Upon disenrollment, the Program Manager shall update the Special Class Code with an “H" to document that the vessel's historical record reflects prior ACP enrollment). G-MOC shall also arrange with G-MIR to have the dry-dock dates deleted from MSIS upon enrollment.

c. The OCMI shall update the ACP examination results in MSIS using the corresponding guidance and codes provided for foreign vessel examinations in MSM II-D.5, 6, and 7.

d. MSIS need only be updated with the information needed to issue the COI as detailed in NIVC 2-95. Lifesaving equipment inspection due dates, machinery inspection intervals, and dry-docking due dates need not be updated in MSIS on ACP ships since the ACP Class Society will be surveying these items. Although the ACP Class Society may or may not update these items in its computer system, it is nonetheless responsible for surveying and issuing the corresponding international certificates for these items on behalf of the Coast Guard.

FIGURE B9-1: ACP RE-EXAMINATION MATRIX

(This formula is used for ACP ships ONLY to determine when a REEXAMINATION is necessary).		
Owner/Operator:		
A.	Ship owned or Operated by a Targeted Owner/Operator	5 Points
	Total Points for Owner/Operator Maximum	*5 Points*
Boarding History:		
A.	Subject to intervention leading to detention within past 12 months	5 Points each
B.	Subject to other operational control within past 12 months	1 Point ea. incident
C.	Involved in marine casualty or oil/hazardous materials incident within past 12 months	1 Point ea. case
D.	Subject of Violation Report within last 12 months	1 Point ea. MV case
E.	Not Boarded within 6 months	1 Point ea. case
F.	"Serious Conditions of Class" (see NOTE below)	5 Points ea. case
	Total Points for Boarding History	*Unlimited Points*
Vessel Type:		
A.	Oil or Chemical Tanker	1 Point
B.	Gas Carrier	1 Point
C.	Bulk Freighter 10 or more years old	2 Points
D.	Passenger Ship	1 Point
E.	Ships carrying low value commodities in bulk	2 Points
	Total Points for Vessel Type	*Max 4 Points*
Total Points		

- To determine reexamination priorities (Priority I, II, III or IV) between annual examinations for ACP ships, the matrix instructions in Section C of Chapter 23 of this volume shall be followed, but add (5) five points for each occurrence of a "serious condition of class" in the "Boarding History" column of the matrix.
- The ACP officer shall obtain a current list of Class Recommendations, Deficiencies or Conditions of Class from the local ACP classification society Surveyor to determine points for this item. Follow Section D of Chapter 23 of this volume to identify and determine ACP reexamination priorities. (It is anticipated that most ACP ships will be priority III or IV for the six month period following the annual exam due to normal downgrading as required in Section D of chapter 23.)
- The OCMI shall work with the ACP Classification Society to ensure immediate corrective action is taken to resolve all serious conditions of class. Points will still be assessed to a participating vessel if any serious conditions of class are first noted by the OCMI upon the vessel's notice of arrival, regardless of subsequent corrective action(s) taken by the ACP classification society.

NOTE: A "Serious Condition of Class" is defined as "any recommendation, deficiency or condition of class issued by the ACP classification society which, in the opinion of the OCMI, poses a significant threat to life, property or to the marine environment". Class items that may be reasonably repaired, replaced or corrected by the due date issued by the ACP Classification Society without risk to life, property or the marine environment shall not be considered as "serious".

CHAPTER 10: THE STREAMLINED INSPECTION PROGRAM (SIP)

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CHAPTER 10: THE STREAMLINED INSPECTION PROGRAM (SIP)

A. INTRODUCTION TO SIP

1. Introduction

SIP is an alternative to traditional Coast Guard inspections that was developed in response to the Maritime Regulatory Reform Initiative. The Initiative challenged the Coast Guard to re-evaluate its regulatory programs and to develop alternatives that would ensure the same level of safety.

➔ **NVIC 2-99 (Series) is to be used as the formal SIP policy guidance document.** The information contained in this Chapter is only intended as program overview. The SIP Website (www.uscg.mil/hq/g-m/sip/siphome.htm) will be periodically updated with new information as the program matures and "Lessons" are "Learned." This is also the site where all of the enclosures to NVIC 2-99 (ICRs by subchapter, ISV, Exam Checklists, USCG SIP Inspection Forms, etc.) can be downloaded.

2. Difference from Traditional Inspections

The significant difference between SIP and the traditional annual inspection program is in the *process* of how compliance is ensured. SIP is primarily an "overlay" of the Code of Federal Regulations (CFR) requirements that regulate vessel safety. It identifies an alternative process for ensuring compliance with the CFR, where company personnel conduct frequent, periodic examinations of the various vessel systems, document their findings, and take the necessary corrective actions specified in the USCG-approved plans when discrepancies are discovered. The Coast Guard will still conduct required inspections of the vessel(s), however, the manner of conducting the inspection will be considerably different.

3. How Compliance is Assured

SIP is not strictly or singularly a "self-inspection" program. However, under SIP the marine inspector's primary focus will be to review the implementation and management of the SIP by the company and check some critical vessel systems to verify accuracy of the records. SIP is based on maintaining enrolled vessels in a continual state of compliance. This continual state of compliance is assured through the development of an OCMI-approved Company Action Plan (CAP) and Vessel Action Plan(s) (VAP).

The company will develop these plans with the assistance of a USCG SIP Advisor, assigned to work with the Company SIP Representative.

B. ENROLLMENT IN SIP INVOLVES A FOUR-PHASE PROCESS

1.	**Phase One: Application**	The company requests in writing to their cognizant OCMI to be considered for SIP enrollment.
2.	**Phase Two: Plan Development**	After a satisfactory review of the company (e.g., review of company records in USCG files, interview of inspectors, etc.), the OCMI will assign a SIP Advisor to assist the Company SIP Representative in developing the CAP and VAP.
3.	**Phase Three: Operational Evaluation**	Once the CAP and VAP are approved, a mutually agreed to trial period will be conducted to operationally test their effectiveness in ensuring continual compliance with the regulations.
4.	**Phase Four: Enrollment**	At the end of the trial period, and at the request of the company, the USCG SIP Advisor will conduct an initial CG SIP Inspection with representatives from both the Company and the Coast Guard Quality Assurance and Travelling Inspector Staff (G-MO-1) to evaluate the program. If successful, the OCMI will endorse the vessel's COI for enrollment in SIP

C. FIRST STEP TOWARDS ENROLLING A VESSEL IN SIP

Download Copies of the Final Rule and the Guidance Document from www.uscg.mil/hq/g-m/sip/siphome.htm . After the vessel owner reviews the documents and decides to pursue enrollment in SIP, application for consideration will have to be made through the local USCG Officer-in-Charge, Marine Inspection (OCMI). The OCMI's staff will provide the vessel owner/operator with information on the application procedures for that Office.

NOTE: In order to save both time and hard-drive space, you will probably only want to download the Inspection Criteria Reference (ICR) that applies to the particular vessel(s).

For any further program questions, please contact the Headquarters SIP Program Manager at G-MOC.

CAVEAT: Under no circumstances is the material contained in the guidance documents—NVIC 2-99 (series)—to be considered complete for all vessels that may be enrolled in SIP. The material is provided as *templates only*. ICRs are to be provided for all vessel systems required to be inspected. This would include relevant sections of Titles 33, 46, and 49 CFR, and amplifying policy or regulations, such as IMO Conventions, Treaties, Navigation and Inspection Circulars (NVIC), The Marine Safety Manual, and Official Coast Guard Policy Letters. These documents should be reviewed periodically for currency and the effected Company and Vessel Action Plans revised as the underlying regulations or policy changes require.

D. GOALS AND BENEFITS

The primary goal of SIP is to have vessels operate in continual compliance with the regulations, rather than the cyclical peaking of vessel materiel condition associated with the traditional annual inspections.

Some benefits that have been realized by companies participating in the prototype programs included—

- better management of vessel costs,
- increased involvement and "ownership" by vessel personnel for the safe operation of the vessel, and an increase in crew professional advancement.

CHAPTER 1: MARINE EQUIPMENT AND MATERIALS

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CHAPTER 1: MARINE EQUIPMENT AND MATERIALS

A. INTRODUCTION

This and the following two chapters concern those provisions of Title 46, Code of Federal Regulations (CFR) that apply to the inspection of equipment and materials for use aboard inspected vessels, and to certain items of equipment carried on uninspected vessels. The Commandant is required by statutes and regulations to approve certain equipment and materials before they are installed or used aboard inspected merchant vessels, certain uninspected vessels, and boats. The controlling regulations are contained in 46 CFR, Subchapter Q. The Commandant's approvals of equipment and materials are published in the Federal Register, and in Equipment Lists, Commandant Instruction (COMDTINST) M16714.3A. Terminations of approval are also published in the Federal Register. COMDTINST M16714.3A includes a separate section listing formerly approved instruments, machines, and equipment that may continue to be used as long as they are in "good and serviceable" condition, unless otherwise noted (see chapter 18 of this volume concerning the equipment card index system). The marine inspector is responsible for determining that equipment and materials are manufactured and installed in accordance with the Commandant's standards as required by regulations. This responsibility is imposed because the public has a reasonable expectation that equipment and materials approved by the Coast Guard will perform as intended in an emergency. Some statutes provide penalties for failure of lifesaving equipment to meet the Commandant's requirements (see 46 U.S.C. 3318(a) and (b)).

B. REPORTS OF UNSATISFACTORY EQUIPMENT

When a factory or shop inspection indicates that equipment or materials required to be Coast Guard approved do not meet the applicable requirements, a report of the situation shall be submitted to Commandant (G-MOC), via the chain of command. If these conditions are serious, the officer in charge, marine inspection (OCMI) and district commander shall take immediate steps to suspend approval, pending final action by the Commandant (see 46 CFR 2.75-40). Reports should also be initiated when vessel inspections indicate problems associated with approved equipment and materials. Although a system exists to report equipment failures, relatively "minor" problems or those for which use of a report form is not appropriate can go unrecorded. In addition, the source of a problem may be a regulation or its interpretation. However, if several inspectors report similar experiences, further investigation by higher authority will be undertaken. The inspector is encouraged to discuss even minor types of problems with supervisors and other inspectors. Reports of unsatisfactory equipment or materials should clearly identify the problem, provide samples or pictures if possible, indicate impact, and offer recommendations for correction. This type of feedback is essential for regulations and inspection policies to remain effective.

C. "ACCEPTED" EQUIPMENT AND MATERIALS

1. Introduction

The sections below describe the requirements for approved equipment and materials. Certain equipment and materials not required by regulation to be approved may be "accepted" by the Commandant for use aboard inspected vessels, uninspected vessels, and boats after certain control actions have been taken (e.g., submittal of an affidavit by the manufacturer that applicable standards will be/have been met). Unlike approved equipment and materials, "accepted" items are not normally published in the Federal Register. However, they are listed in Equipment Lists and in the Proceedings of the Marine Safety Council.

2. Marine Engineering Equipment

Certain marine engineering equipment, e.g., valves, fittings, and flanges, can be accepted on an affidavit basis if certain regulatory requirements are met (see chapter 18 of this volume).

3. Welding Filler Metals

For hull construction, foreign and domestically manufactured filler metals must be tested by the American Bureau of Shipping (ABS) and listed in its publication Approved Welding Electrodes, Wire-Flux, and Wire-Gas Combinations. In those cases where limited application may preclude such listing, acceptance by the Commandant will be based upon a satisfactory procedure qualification by the fabricator. For lifesaving equipment, specific acceptance of the welding procedure shall be obtained from Commandant (G-MVI). Under 46 CFR 57.03-1(e), type E6012, E6013, E6014, E6024, E7014, and E7024 electrodes may be used only when the welding procedure used for a specific electrode is qualified by the marine inspector, in accordance with the requirements of 46 CFR 57. These electrodes may not be used in the following instances:

a. On lifesaving equipment;

b. In ship's hull fabrication or repairs that involve butt welds in the shell, strength deck, tank top, strength bulkhead, or longitudinal strength member; and

c. On galvanized materials, unless the welding procedures used for the specific electrode are qualified by the inspector in accordance with the procedures outlined in Section 30, Part III of the ABS Rules For Building And Classing Steel Vessels.

Generally, these electrodes may be used in horizontal and flat fillet weld attachment of hull stiffening members, provided the welding procedures are qualified in accordance with Section 30, Part III of the ABS Rules. The inspector may require such workmanship tests as deemed necessary to determine that satisfactory welds are being produced.

NOTE: The use of E7024 electrodes is contingent upon periodic weld testing to ensure that adequate weld quality is maintained. Acceptable welds with E7024 rods cannot be determined by a one-time test.

4. Electrical Equipment

Manufacturers of electrical equipment may obtain prior acceptance of the products through the Underwriters Laboratories, Inc. (UL) Marine Listing Service. A UL "Marine Listing" or "Marine Listing For Use On Vessels Over 65 Feet" indicates that, in addition to meeting UL standards, a product meets applicable requirements of 46 CFR, Subchapter J (Electrical Engineering). This arrangement has resulted from "Marine Supplements" to certain UL electrical standards, which contain specifications meeting the applicable requirements of Subchapter J. The equipment must be marked "Dripproof," "Watertight," or "Suitable For Use In Corrosive Locations" if it is to be used in a location where the regulations require such enclosures. In such cases, the UL label will indicate the particular listing for the equipment. Electrical equipment not having a UL "Marine Listing" may be accepted by the Marine Safety Center (MSC) on a case-by-case basis.

5. Ships' Stores and Supplies

46 CFR, Subchapter N, specifically 46 CFR 147, details items of ships' stores and supplies that must be tested and certificated by the Coast Guard before they may be stowed or used aboard inspected vessels.

D. 46 CFR, SUBCHAPTER Q, SPECIFICATIONS

1. Introduction

During World War II, it was found that specifications for certain approved equipment and materials provided greater uniformity in their production by various manufacturers. Equipment that met neither the intent of the regulations nor the minimum standards were easily detected and eliminated from service. In 1945, the Commandant established the regulations in 46 CFR 160-164 (Subchapter Q). Its purpose was to consolidate the specifications for equipment and materials that were required to be approved by the Commandant, or to meet certain minimum standards. Also, requirements for the operation and construction of inspected vessels were distinguished from specifications applicable to the manufacturers of approved equipment and materials used aboard vessels.

2. Application

Each item approved under Subchapter Q is assigned a basic approval number. This includes the number of the CFR subpart under which an item was approved, thus identifying the general requirements for its approval. No two specifications have the same number. Subchapter Q has been separated into six parts:

	TYPE	CFR CITE
a.	Approval of Equipment and Materials (general)	46 CFR Part 159
b.	Lifesaving Equipment	46 CFR Part 160
c.	Electrical Equipment	46 CFR Part 161
d.	Engineering Equipment	46 CFR Part 162
e.	Construction	46 CFR Part 163
f.	Materials	46 CFR Part 164

Each specification in Subchapter Q is complete, prescribing corollary specifications, materials permitted to be used, types and sizes of equipment, construction and workmanship requirements, markings, and inspections required, and procedures for obtaining the Commandant's approval, if required. Although these specifications are intended primarily for the benefit of the manufacturer, the inspector also benefits from the consolidation of applicable requirements.

3. Certification of Approvals

Manufacturers of items considered satisfactory for the purpose(s) intended are issued an approval certificate by the Commandant. Notice of the approval and the item's approval number are published in the Federal Register and Equipment Lists. The approval number applies only to an item that is manufactured in accordance with approved plans, specifications, or other data submitted during the approval process. An item that is manufactured with changes in design, or with materials that are not previously approved by the Commandant, is not "approved" under the approval number listed for a particular item.

E. COMMERCIAL DIVING EQUIPMENT

1. Introduction

The objective of the Coast Guard's commercial diving regulations, contained in 46 CFR 197, is to set minimum safety standards for the diving industry. Compliance is verified by marine inspectors coincident with other inspection activities. Inspection of diving equipment and facilities shall be conducted when diving operations occur on:

a. Vessels inspected for certification;

b. Deepwater ports; and

c. Structures and mobile offshore drilling units (MODU's) operating on the Outer Continental Shelf (OCS) of the U.S.

Marine inspectors shall be familiar with the requirements of 46 CFR 197. Volumes I and II of the U.S. Navy Diving Manual, Naval Ship Systems Command (NAVSHIPS) 0994-001-9010, contain useful information about diving equipment and operations.

2. Equivalent Equipment, Materials, and Procedures

Under 46 CFR 197.206, the Coast Guard may accept equivalent equipment, materials, and procedures for use in diving operations. Such acceptances shall be approved by Commandant (G-MOC), which can be reached at (202) 267-1464.

3. Pressure Vessels for Human Occupancy (PVHO's)

a. PVHO's used in commercial diving operations within Coast Guard jurisdiction must have acceptable certification. This will take one of the following forms:

(1) PVHO's already certified and stamped in accordance with 46 CFR, Subchapter F.

(2) PVHO's already certified and stamped in accordance with the American Society of Mechanical Engineers (ASME) PVHO-1.

(3) PVHO's contracted for or constructed before 1 February 1979 that were submitted to the Coast Guard for approval prior to 1 February 1984. Design drawings and calculations must be submitted no later than 31 May 1984. If not, see subparagraph E.3.a.(4) below.

(4) Any other PVHO without USCG or ASME PVHO-1 certification and stamping must have plans and specifications approved by the Coast Guard as meeting ASME PVHO-1, and be tested to the satisfaction of the cognizant OCMI before it may operate.

b. Any PVHO in use within U.S. jurisdiction not fitting any of these criteria is being used in violation of the regulations.

c. Inspection and testing by OCMI's of PVHO's not already certified per subparagraph E.3.a above should include, as a minimum, a thorough visual exam, pneumatic or hydrostatic test, operational check, and appropriate nondestructive testing (NDT) of the welded joints. NDT would not normally include radiography unless either MSC review indicates it is necessary to satisfy code requirements or OCMI inspection revealed information indicating such testing was necessary. This information could include material condition, operational history and repair history (e.g., heavy corrosion, surface defects in welds, exposure to high temperatures, etc.).

d. Following satisfactory review by the MSC and testing to the satisfaction of the cognizant OCMI, a letter shall be issued by the OCMI identifying the PVHO and its operating parameters. This letter shall be available at the dive location.

e. Technical review criteria developed by Commandant (G-MTH-2) is available at the MSC. Questions regarding same should be referred to the MSC.

f. Other approved PVHO's and diving system pressure vessels that are permanently installed shall be considered as part of the vessel and likewise be inspected under Subchapter F.

g. Approved PVHO's and all other diving system pressure vessels that are temporarily installed shall be considered separate from the vessel, and inspected under 46 CFR 197.462 (except for compressed gas cylinders).

h. U.S. made compressed gas cylinders may be accepted for use in a diving system, provided they comply with 46 CFR 197.338. Those of foreign manufacture may be used, provided that:

(1) U.S. made, Department of Transportation (DOT) approved cylinders are not readily available;

(2) They have been hydrostatically tested within the past 5 years; and

(3) The standards of their manufacture shall be compared with 46 CFR 173.34 and 49 CFR 178 to verify equivalence before they are accepted. The OCMI's analysis of foreign standards shall be forwarded to Commandant (G-MOC) for review.

i. Permanently installed diving system piping shall be inspected under Subchapter F; temporarily installed piping shall be inspected under 46 CFR 197.

4. Dynamically-Positioned Vessels and "Liveboating"

Introduction

a. Introduction. When the commercial diving regulations were written in 1978, dynamically-positioned (D-P) vessels were not addressed. At that time little, if any, interest was expressed in their use in U.S. waters. More recently, D-P vessels have gained in popularity; they are expected to become more widely used in the future. A problem has arisen in the application of 46 CFR 197, in that the definition of "liveboating" could be strictly interpreted to include D-P vessels, due to their use underway (i.e., not anchored or moored). However, the Commandant recognizes the unique characteristics of D-P vessels and their overall superior performance in North Sea operations.

Application of Diving Requirements

b. Application of Diving Requirements. For purposes of applying the requirements of 46 CFR 197, a D-P vessel shall be considered to be any vessel that uses an automated station-keeping device to operate its propulsion systems, so as to keep the vessel in a relatively stationary location. The following guidelines shall be applied in interpreting the regulations relative to D-P vessels:

(1) The D-P and its propulsion systems shall be fully operational under all conditions likely to occur during the diving operation.

(2) The master of the vessel shall be experienced and thoroughly familiar with the vessel's installations, as well as the nature of the underwater work being conducted.

(3) All diving activities shall employ a diving bell in a moon-pool arrangement. The bell's umbilical shall be held in constant tension to prevent fouling the vessel's screws. Divers' umbilicals from the bell shall be of sufficient length that they, likewise, cannot foul the vessel's screws.

(4) Surface diving activities shall not be conducted from D-P vessels.

Application of 46 CFR 197.436 Requirements

c. Application of 46 CFR 197.436 Requirements. Only the following provisions of these regulations shall be applied to D-P vessels engaged in diving activities:

(1) Paragraph 197.436(a)(1) Vessel station-keeping abilities;

(2) Paragraph 197.436(a)(4) Rescue boat availability; and

(3) Paragraphs 197.436(c)(2)-(7) Diving supervisor's responsibilities.

F. MISCELLANEOUS INSPECTIONS OF EQUIPMENT AND MATERIALS

1. Introduction

Occasionally, Coast Guard marine inspectors are called upon to inspect boilers, pressure vessels, and other equipment and materials of Coast Guard units and federal, state, and local agencies. For example, a hull inspector may be requested to assist in the survey of a Coast Guard small boat, or a machinery inspector may be asked to investigate a boiler casualty aboard a government vessel. The Commandant desires inspection personnel to fulfill such requests as time and local resources permit. Records of such activities shall be made on the forms supplied by requesting agencies or on forms produced locally. Reports shall be made in accordance with the policy in chapter 3 of this volume.

2. Materials and Equipment Obtained for Coast Guard Use

a. General Provisions. As directed by the Commandant or requested by the district commander, the OCMI shall supervise the inspection of equipment and materials purchased for Coast Guard use, in accordance with the contract, purchase order, plans, or specifications furnished. It is contemplated that marine inspectors will examine materials and equipment such as boilers, machinery, auxiliaries, related fittings, and other materials normally inspected for use in the marine industry. The inspector shall interpret plans and specifications as fully as practicable; when questions or doubts arise, the matter shall be referred to the OCMI, the district commander, or the Commandant, as appropriate.

Duties of the Marine Inspector

b. Duties of the Marine Inspector.

(1) To become familiar with the contract and specifications for the material(s), and all related correspondence;

(2) To become acquainted with the flow of production and shipment so that progress of the work may be reported periodically;

(3) To assist the manufacturer in ensuring that Coast Guard requirements are met; and

(4) To report any failure of the manufacturer to fulfill the requirements of the contract, purchase order, plans, specifications, or instructions for the work.

3. Definitions

Full Coast Guard Inspection

a. Full Coast Guard Inspection. This occurs when all materials purchased by a contractor are inspected and tested, in accordance with all requirements of the contract, work order, or other documentation. This type of inspection is rarely required, as it involves very close attention to the work and, probably, assignment of a full-time inspector.

Performance Inspection

b. Performance Inspection. This type of inspection may require operation under "no load" conditions for a period required by the specifications, or demonstration of the load requirements.

NOTE: The work documentation must be explicit concerning such requirements.

Surface Inspection

c. Surface Inspection. When this inspection is required, the material shall be visually examined for appearances and imperfections, and critical dimensions shall be checked. No chemical analysis or physical tests need be conducted.

Shipping Inspection

d. Shipping Inspection. This merely requires that materials be properly packed, marked, and shipped in the proper quantities in accordance with the work documentation.

CHAPTER 2: INSPECTIONS OF VESSEL EQUIPMENT AND MATERIALS

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CHAPTER 2: INSPECTIONS OF VESSEL EQUIPMENT AND MATERIALS

A. GENERAL PRINCIPLES

1. Reasons for Coast Guard Control

All items of equipment installed on vessels subject to Coast Guard inspection and certification are subject to some degree of inspection and approval. Certain items are subject to inspection and approval even when carried aboard vessels not required to be inspected and certificated, such as fishing vessels and yachts. The extent of inspection and the type of approval varies with the requirements of laws and regulations, as well as the hazards involved. In judging the quality and suitability of equipment used on vessels, the primary considerations are:

Safety of the Vessel

a. To safeguard the vessel, equipment must be of good quality and suitable for its intended use. In judging suitability, the marine inspector must consider potential hazards of fire, explosion, failure of watertight integrity, and the risks involved if the equipment fails to function.

Safety of Personnel

b. The vessel's equipment must provide the maximum practicable safety for passengers and crew. For example, cargo pumps and piping used in carrying dangerous liquids or gases must be designed, constructed, and maintained to transfer cargoes efficiently and safely.

Performance of a Safety Function

c. Many items, such as lifesaving equipment and firefighting equipment, are carried solely to perform a safety function. They are not used on a daily basis, but they must perform immediately and effectively in an emergency. It is essential that such items are of good quality, suitable for its intended use, maintained in good condition, and readily accessible.

2. What the Coast Guard Controls

Design

a. Various statutes and regulations provide for control of the design of equipment to be used aboard vessels. The degree of control exerted by the Coast Guard depends upon the potential hazards involved, and is discussed in the inspection regulations. In approving a particular design, marine inspectors must consider the safety of the vessel and its personnel, and the ability of the equipment to perform its intended function in the event of emergency.

Construction

b. The degree of control exerted is specified in the applicable regulations. Depending upon the hazards involved, such control might extend to specification of materials, methods of welding or riveting, and inspections and tests during and after construction.

Installation

c. Although certain qualities of equipment installation are controlled through construction and plan approval, the primary responsibility for ensuring the suitability of an installation rests with the inspector. Regardless of the general requirements of the regulations, or specific approvals of plans and specifications, the inspector must determine at the initial inspection (during or following installation) that the installed equipment is safe and will perform as intended. Careful consideration is essential at this point, because approved installations normally should not be subjected to different requirements at later inspections. In considering the suitability of an installation, the inspector must consider security against movement, safeguards to personnel, and location with respect to other items on the vessel.

3. How the Coast Guard Controls

Standards

a. The standards for the design, construction, and installation of equipment on vessels may be specified in the regulations, or contained in other recognized, published standards. When no specific standard is given, the officer in charge, marine inspection (OCMI) shall determine if this equipment is suitable for its intended use.

Plan Approvals

b. Plans may be required by the Commandant for equipment of new, unusual, or potentially hazardous design.

Type Approvals

c. Various regulations require equipment to be of types approved by the Commandant. When type approval is required, the Coast Guard establishes specifications or standards that must be met. Manufacturers must show that their products meet these standards before type approval is given.

Tests and Inspections

d. Various regulations require certain tests and inspections of vessel equipment to determine its suitability. Depending upon the hazards involved, tests and inspections may be conducted throughout the manufacturing process, during the installation, or both. These tests and inspections are intended to determine whether the applicable standards are met, whether the equipment is safe for the vessel and personnel involved, and whether it will serve its function.

B. RESPONSIBLE PARTIES

1.	**Manufacturers**	Manufacturers of marine equipment have a basic responsibility to supply equipment that is satisfactory for its intended use and in compliance with applicable standards. Regulations contain specific requirements for manufacturers to follow in certain cases, but for many items only good commercial quality is required.
2.	**Vessel Owners**	Owners are expected to supply and maintain the equipment aboard their vessels in accordance with applicable regulations. When the regulations do not specify requirements for vessel equipment, the vessel owner must supply equipment that is safe and suitable for its intended use. Such equipment shall be installed under the cognizance of the OCMI, and the vessel owner shall be responsible for its continued maintenance.
3.	**Vessel Personnel**	The vessel's officers and crew are required to maintain equipment in a satisfactory condition, ready to perform its intended function.
4.	**Class Societies**	Perform some equipment manufacture oversight and some survey responsibility for ensuring proper equipment.
5.	**Coast Guard Technical Personnel**	Commandant (G-MOC and G-MSE) and the Marine Safety Center (MSC) review plans and specifications for compliance with the regulations and suitability with the intended use of equipment.
6.	**Coast Guard Inspection Personnel**	Marine inspectors have the final responsibility for determining whether a piece of equipment complies with requirements and is suitable for its intended use.

C. CATEGORIES OF ACCEPTABLE EQUIPMENT

1. Equipment Manufactured Under Coast Guard Control

Certain items of equipment are required to be manufactured under Coast Guard control. This control requires the submittal and approval of plans, materials, and methods of construction, and tests and inspections by the Coast Guard during and after both manufacture and installation.

2. Approved Equipment

General Approvals

a. Various items of lifesaving, firefighting, pollution prevention equipment, and miscellaneous equipment used aboard inspected and uninspected vessels are required by statutes and regulations to be of types that are "approved" by the Commandant. To be an "approved" type, equipment must be manufactured in accordance with standards published in 46 CFR, Subchapter Q (Specifications) or, when specifically permitted by regulation, must comply with the standards of a classification society, such as the American Bureau of Shipping (ABS), that is recognized by the Commandant. To this end, the manufacturer must submit plans and specifications to the Commandant. After their approval, the product must be labeled so that it can be identified as approved equipment.

Certification

b. Equipment that is approved by a classification society without plan review by the Coast Guard must likewise be labeled to indicate compliance with required standards and approval. Types of equipment that are considered to conform to Subchapter Q specifications are formally listed in the Federal Register (FR). A certificate of approval is issued to the manufacturer of the equipment by Commandant (G-MOC). Equipment of an approved type that meets the specifications in Subchapter Q is listed in Equipment Lists, Commandant Instruction (COMDTINST) M16714.3A and MSIS. (See paragraph 18.D.5 below concerning the approved equipment card index system.)

3. Equipment Acceptable Under Affidavit

General

a. The requirements that manufacturers must meet to have their products accepted on an affidavit basis and listed in Equipment Lists/MSIS are detailed in 46 CFR 50.25; such items include certain valves, fittings, and flanges. Manufacturers of affidavit products that are not included in Equipment Lists may provide valves, fittings, and flanges for acceptance on an individual vessel basis. Other items, such as piping, tubing, standard pipe-joining fittings, bolting, castings, forgings, plates, and bar stock may be accepted on the basis of a manufacturer's or mill certificate. Such certificates contain the applicable standard society's specifications. 46 CFR Table 50.25-1(a) is an aid to the inspector in determining what is required of the manufacturer.

Verification of Markings

b. A manufacturer typically makes some products that comply with the regulations and some that do not, simply because the marine market is generally a small percentage of its business. The manufacturer is required only to make one valve, fitting, or flange that complies with material requirements to receive an affidavit for the equipment and be listed in Equipment Lists/MSIS. Therefore, it should not be construed that because a manufacturer is affidavited that its product is satisfactory. Products of affidavited manufacturers should be reviewed to determine acceptability in the same manner that products of nonaffidavited manufacturers are reviewed. The marine inspector should check the markings on a component when installed to verify that it is of the required type, as indicated on the approved plans. In cases of discrepancies, the inspector shall contact the MSC for guidance.

4. Equipment Acceptable after Type Tests

Equipment of a given design may be given general acceptance for use on inspected vessels after it has proven satisfactory by type tests. Coast Guard approval of plans and specifications may also be required prior to type tests. Under 46 CFR 58.30-15(f), hydraulic system components fabricated from certain ferrous or aluminum alloys which exhibit a low ductility, must be impact-shock tested by an independent laboratory acceptable to the Commandant. Hydraulic components that have proven satisfactory by impact-shock tests are listed in Equipment Lists/MSIS. Inquiries as to whether a particular testing laboratory may conduct the required tests should be addressed to Commandant (G-MSE).

5. Equipment Types Acceptable Upon Plan Approval

Equipment of a given design may receive approval for use on inspected vessels after Commandant (MSC) has examined all plans and specifications, and has determined that it will meet applicable requirements. Approvals are limited to the installation(s) for which plans were submitted. Previously approved plans may be used in subsequent installations by following the requirements in 46 CFR 50.20-15. Type approvals are issued only under Subchapter Q (under 46 CFR Table 50.25-1(a) for hydraulic system components that require testing, as indicated in paragraph 18.C.4 above).

6. Portable Equipment

Portable electric equipment may be accepted in several ways. Portable cargo lights are covered under the Underwriters Laboratories, Inc. (UL) "Standards for Marine-Type Electric Lighting Fixtures." These lights are labeled to indicate UL approval as "marine types"; portable items covered by this category are considered satisfactory. Portable items not labeled by UL must be checked to ensure compliance with 46 CFR, Subchapter J. Portable fixtures should be referred to the MSC for determination. Approval of portable lighting devices by inspectors is not advisable, as temperature test data are needed to evaluate these fixtures properly. Portable tools can be accepted if the design appears to be commercially sound. This can be verified by a UL listing under the classification "Tools - Commercial Type."

7. Individual Items Accepted Under Society Standards

Individual items of equipment are acceptable for use on inspected vessels when they meet the standards of a classification society specified by the applicable regulations. For example, 46 CFR 58.01-5 provides for the acceptance of main and auxiliary machinery that meets the standards established by ABS. Lighting fixtures listed under the UL "Standard for Marine-Type Electric Lighting Fixtures" are accepted for use on inspected vessels (see 46 CFR 111.75-20). Other electrical equipment, such as junction boxes and switches, that have a UL Marine Listing or Marine Listing for Vessels Over 65 Feet are also acceptable for use on inspected vessels, provided they have the necessary rating and their enclosures are appropriate for the location in which they will be installed.

8. Equipment Required to Meet Installation Standards

Throughout the regulations, there are requirements covering the safe installation of equipment. In many cases, specific inspections and tests are required during or after installation.

9. Permitted Articles of a Dangerous Nature

Articles of a dangerous nature for ships' stores and supplies are prohibited by 46 CFR, Subchapter N (Dangerous Cargoes), unless specifically permitted aboard. Certificates are issued to manufacturers of permitted articles that comply with these requirements.

10. Equipment for Which Standards are Not Specified

Items of equipment for which specific standards are not specified by law or regulation are required to meet an acceptable standard of safety, and must be suitable for the purpose intended. Normally, such items that meet the standards of a recognized code or "good marine practice" will be considered suitable by the Commandant.

11. Equivalent Equipment

Throughout the regulations, there is authority for the Commandant, district commander, or OCMI to accept substitute equivalent equipment or materials, and alternate materials or methods of construction. For example, an equivalence has been filed with the International Maritime Organization (IMO) for substitution of life rafts for lifeboats on vessels under 1600 gross tons (GT) making international voyages, under certain conditions. The text of the equivalence notice is as follows:"Regulation 35 of Chapter III of the International Convention for the Safety of Life at Sea (SOLAS), 1960 provides that every cargo ship, with certain exceptions, shall carry lifeboats on each side of the ship of such aggregate capacity as will accommodate all persons on board and, in addition, shall carry life rafts sufficient to accommodate half that number. The Government of the United States of America gives notification of acceptance of the following equivalent arrangement under the provisions of Regulation 5, Chapter I of the convention: Cargo vessels of 500 GT and over but less than 1600 GT, except tankers, may be equipped as follows:

a. On each side of the vessel, one or more davit-launched inflatable life rafts of sufficient capacity to accommodate the total number of persons aboard;

b. A minimum of one launching device on each side of the vessel. Operation of the raft launching device shall not require anyone to remain aboard;

c. Sufficient float-free inflatable life rafts with capacity to accommodate not less than one half of the total persons allowed on board;

d. On a vessel for which persons aboard will have an escape route not requiring them to board inflatable life rafts by first entering the water nor to descend to them a distance in excess of 4-1/2 meters, float-free inflatable life rafts of sufficient capacity on each side of the vessel to accommodate the total number of persons aboard may be substituted for the davit-launched rafts and launching equipment required by a and b above;

e. A motor-propelled rescue boat suitable for ocean service with a davit or other suitable launching device capable of launch by no more than three persons."

NOTE: In accordance with current regulations, only the Commandant can approve such an equivalent arrangement. Requests for such substitutions shall be forwarded to Commandant (G-MOC).

D. REFERENCES

1. SOLAS 74 ILLC 66 MARPOL

SOLAS 74 contains specific requirements for the equipment used on vessels making international voyages; these requirements are also in the regulations. The International Load Line Convention of 1966 contains provisions affecting equipment used on inspected vessels. Also, MARPOL/Resolution 393 requires equipment to be approved.

2. Regulations

a. 33 CFR 151-159 (Subchapter O) contains requirements for oil and hazardous substance equipment such as oil-water separators, oil content monitors and alarms, as well as marine sanitation devices (MSD's).

b. 33 CFR 173-183 (Subchapter S) contains safe powering and equipment requirements for recreational boats and boats carrying six or less passengers.

c. 46 CFR 2.75 and 159 contain requirements and procedures for equipment type approvals, filing of affidavits by equipment manufacturers, and requirements covering the acceptance of portable fire extinguishers.

d. 46 CFR 2.95-10 contains information and requirements concerning retention of records of approved equipment by manufacturers.

e. 46 CFR 160-164 (Subchapter Q) contains specifications for equipment that is given type approval.

NOTE: Equipment that is not mentioned in these regulations must be acceptable to the Coast Guard.

3. Equipment Lists, COMDTINST M16714.3A

This publication (old CG-190) contains listings of various lifesaving, firefighting, pollution abatement, engineering, electrical, and miscellaneous equipment used on vessels. These items are approved or accepted by the Commandant, as required by certain laws and regulations. Changes to this publication are issued in the Federal Register and reprinted in the Proceedings of the Marine Safety Council. It contains four sections that deal with:

a. Approved instruments, machines, and equipment;

b. Manufacturers who have submitted affidavits for valves, fittings, and flanges (see paragraph 18.C.3 above);

c. Acceptable hydraulic components; and

d. Formerly approved instruments, machines, and equipment that are no longer manufactured as approved equipment. Unless otherwise noted, such items may be used as long as they are in good and serviceable condition.

6. Industry Standards

Effective 28 August 1991, Federal Regulations were revised to incorporate industry standards for various marine engineering equipment. Incorporation of industry standards reduced the need for detailed regulations. In some cases, regulations concerning the design, construction and testing of equipment have been removed. Manufacturers may continue to build and mark approved products affected by the new regulations until their Certificate of Approval expires.

E. MARINE ENGINEERING EQUIPMENT

1. Unfired Pressure Vessels

Construction Standards

a. Pressure vessels shall be designed, constructed, and tested in accordance with the requirements of 46 CFR 54, which modifies the rules of Section VIII (Pressure Vessels) of the American Society of Mechanical Engineers (ASME) Code. All pressure vessels intended for ships' service, such as compressed air tanks, heat exchangers, and refrigeration equipment are covered by these rules. (Refer to MSM VOL IV for details)

NOTE: See MSM II, Sec. A, Ch. 4 for further information on plan submittal.

Hydraulic Accumulators

b. These components are inspected, stamped, and approved in a manner similar to pressure vessels, including the use of Form CG-2936, the Manufacturer's Data Report for Boilers, Pressure Vessels, or Nuclear Pressure Vessels. Regulations dealing with the peculiarities of these accumulators are established in 46 CFR 58.30-25. The general design, fabrication, inspection, testing, and stamping requirements are contained in 46 CFR 54. The regulations require accumulators to meet the applicable requirements of 46 CFR 54.01-5(c)(3), (c)(4), and (d), or the remaining requirements in Part 54. Existing installations that do not have Coast Guard stamped accumulators shall be referred to Commandant (G-MTH-2). The biennial inspection of accumulators, as required by 46 CFR 61.10-5, shall be limited to an operating test to avoid damaging the internal parts of the accumulator.

TAO 187 Class Vessels

c. The ram tensioners on the fueling at sea (FAS) and replenishment at sea (RAS) stations, on the TAO 187 class vessels have been determined to be hydraulic accumulators. Periodic testing shall be conducted as noted in paragraph b above. The air receivers serving the ram tensioners for the FAS and RAS stations should be built in accordance with 46 CFR 54.01-5(c)(3) and properly marked and stamped in accordance with 46 CFR 54.10. If marking and stamping is not found during inspection of these air receivers, the vessel owner must again provide satisfactory evidence to the OCMI that the air receivers on board have been built in accordance with 46 CFR Part 54. The air receivers serving the FAS and RAS stations require periodic testing. However, they may be examined internally in accordance with 46 CFR 61.10-5(e)(4). Use of a borescope, ultrasonic thickness testing or acoustic emission testing may be used to satisfy the internal and external inspection requirements of 46 CFR 61.10-5(b).

Compressed Air Cylinders/Pressure Vessels in Totally Enclosed Lifeboats

d. Two types of cylinders/pressure vessels are approved for use in totally enclosed lifeboats on offshore platforms, mobile offshore drilling units (MODUs), and other vessels. These compressed air systems provide combustion air for the engine and breathing air for the crew when operating in a closed condition. One type of pressure vessel is approved by the Coast Guard under 46 CFR, Subchapter F; the other type is approved under the Materials Transportation Bureau's (MTBs) regulations, 49 CFR 173 and 178, Subpart C, which were formerly promulgated by the Interstate Commerce Commission (ICC). The type of device can be determined by its markings. Coast Guard approved pressure vessels should be periodically inspected and tested as required by 46 CFR 61.10. MTB/ICC cylinders should be periodically inspected and tested as required by 49 CFR 173.34(e). (Refer to NVIC 3-95)

2. Welding Equipment

Electric Welding Equipment

a. There are no specific prohibitions of the installation of electric welding machines on vessels, including passenger, tank, and cargo vessels. However, 46 CFR 35.01-1, 50.05-10, 71.55-1, and 91.45-1(a) require the approval of the OCMI before repairs are undertaken with such systems. Installation of electric welding machines should be discouraged on tank vessels. When welding machines are permitted, adequate instructions for their safe use shall be posted aboard the vessel. These instructions should call attention to the Coast Guard regulations concerning repairs to vessels and their equipment.

Oxyacetylene Welding Equipment

b. Specific permission from the OCMI is not required for a vessel to carry such equipment. However, it must be stored in accordance with and in quantities not exceeding those allowed by 46 CFR 147.05-100. Suitable safety instructions on the use of this equipment shall be posted on the vessel. Hard pipe oxygen and acetylene distribution systems are not authorized.

3. Pipe Fittings

Cargo Hose Couplings

a. Oil transfer hoses carried aboard vessels are subject to the requirements of 33 CFR 154.500. Each hose assembly must have fully threaded connections, flanged connections that meet the American National Standards Institute (ANSI) Standard B16.5 or B16.24, or quick disconnect couplings shall be designed, constructed and tested in accordance with American Society of Testing and Materials Standard (ASTM) F-1122. Quick disconnect hose couplings are divided into: Standard Class and Class I. Vessels carrying hazardous material in bulk are required to use Class I quick disconnect couplings. Class I quick disconnect couplings and hose assemblies are subject to the requirements of 33 CFR 153.940. Quick disconnect couplings must be marked with the ASTM specification number and "CL I" if they are Class I adapters or couplers.

NOTE: The Coast Guard no longer maintains a list of quick disconnect couplings accepted under 33 CFR 154.500 and 153.940.

Aluminum Flanges

b. Aluminum flanges were previously approved under 33 CFR 154.500 by reference to ANSI B16.31. This reference was removed from the regulations when ANSI dropped the standard for revision. In the interim, aluminum flanges manufactured and stamped under the old B16.31 standard are approved for oil transfer service as long as they remain in good condition and comply with the testing requirements of 33 CFR 156.170. For new flanges not stamped ANSI B16.31, it is the operator's responsibility to provide documentation from the manufacturer that it is equivalent to the old standard. The B16 Committee is presently developing a new standard for aluminum flanges.

Nickel Flanges

c. Nickel alloy flanges (stainless steel), once part of the old B16.31 standard, were moved to ANSI B16.5.

Inspection of Flexible Hose Assemblies

d. Nonmetallic flexible hoses shall be designed, constructed and tested in accordance with Society of Automotive Engineers (SAE) J-1942. This standard refers to SAE 1475 for fitting standards. Hoses that meet the requirements of 46 CFR 56.60-25(c) are approved as long as they remain in good condition. These hoses have exterior coverings that when damaged could allow moisture to enter the inner tube material and wire braid, causing rapid corrosion and failure of the hose. When replacement is necessary, they should be replaced with hoses meeting SAE J-1942 standards.

(1) Use of Flexible Hoses. The use of the flexible hoses is restricted to vital and non-vital fresh and salt water systems, non-vital pneumatic systems, lube oil and fuel systems, and fluid power systems. To ensure the reliability of these systems, a thorough examination of these hoses shall be made at the regular inspection period. Minor breaks, cuts, or abrasions in the covering may be allowed. However, the hose shall be replaced if corrosion of the interior material is found.

(2) Markings. The list of approved hoses should be checked to determine the acceptability of a specific hose.

NOTE: The Coast Guard is negotiating for SAE to assume responsibility for maintaining an up-to-date list.

(a) Hoses and hose assemblies meeting SAE-J1942 must be marked with the maximum operating pressure, manufacturer's name and part number, and hose size.

(b) Hoses may be marked in accordance with SAE J-517 standards. SAE J-517 is the basic standard for hydraulic hoses. The markings will include the following:

(i) SAE hose specification number (including type designation where applicable);

(ii) maximum operating pressure;

(iii) manufacturer's name, part number; and

(iv) hose size.

(v) Identifying the recommended service is optional. However, hoses may be marked with the following codes from SAE-J1942:

CODE	SERVICE DESCRIPTION
HF	All Services
H	Fluid Power
F	Lube Oil and Fuel Oil Systems
VW	Vital and Nonvital Fresh and Salt Water
NVW	Nonvital Water and Pneumatic

(vi) To expedite inspections, hoses may also be marked with the propeller symbol followed by the appropriate alphanumeric code. An example is "SAE J-517, ABC Co. P/N A35, 100R2AT-8 FEB 89 HF." This example describes a hose that is 1/2 in. I.D., 2-Wire, Type AT, 3500psi hydraulic service rating, acceptable for All Services applications."

NOTE: Identifying hoses as acceptable for the intended service may be complicated, especially since using the service code is optional. For instance, hoses marked HF may have different pressure ratings for different services. Often, only the highest pressure rating is marked on the hose. Also, hoses marked as complying with SAE J-517 may not have undergone the fire test required by SAE J-1942 and are not acceptable for fuel/lube oil service. The suitability and pressure rating for the intended service should always be verified with the manufacturer.

Flexible Pipe Couplings

e. The regulations in 46 CFR 56.30-35 and 40 describe the limitations and installation requirements for the various types of flexible pipe couplings. Flexible couplings should be equipped with positive restraints to limit angular deflection and to keep the pipe from "creeping." Couplings should not be used as a vibration dampener, or to correct excessive misalignment. Pipe brackets and supports should be included in the inspection of flexible couplings and their restraining devices. Damaged or deteriorated gaskets shall not be reinstalled. Indications of excessive or premature wear shall be further investigated and steps taken to correct the cause before placing the joint back in service. The OCMI shall be satisfied that new and existing flexible pipe couplings are suitable for the service intended.

4. Spark and Flame Arresters

Spark Arresters in Exhaust Lines

a. Requirements for spark arresters in gasoline and diesel engines are contained in 46 CFR 58.10-5, 58.10-10, 182.15-20, and 182.20-20. The Coast Guard does not have a specification for such spark arresters. They shall be accepted after installation and a demonstration that the spark arrester will prevent the emission of glowing embers.

Flame Arresters for Gasoline Engines

b. Manufacturers must comply with the requirements contained in SAE 1928 for backfire flame arresters and engine and fuel air induction systems or UL 1111 for backfire flame arresters. The requirements contained in 46 CFR 162.041 - 162.043 have been removed from the regulations.

Engine Air Induction Systems

(1) 46 CFR 58.10-5(b)(3)(iii) has been revised to allow a manufacturer to incorporate an engine air induction system without formal approval and labeling if it meets the flame dispersal, construction, and installation criteria contained therein. The difference between this type of system and a system that is required to meet an adopted standard is that the flame is dispersed outside the vessel.

Two Cycles Engines With Reed Valve Assembly

(2) Two-cycle engines using a reed valve assembly do not require backfire flame arresters. Reed valves inherently protect against backfire. They are not subject to Coast Guard approval. Owners must provide satisfactory evidence of reed valve installations, such as a manufacturer's certificate or a proper maintenance manual.

Markings

(3) Permanent markings attesting to compliance with either standard must be clearly evident. The marking shall include the following:

(a) manufacturer's name or trademark;

(b) identification by style, type or model number; and

(c) the word "MARINE".

NOTE: The marking for engine and fuel air induction system will probably be located on the carburetor cover.

Tank Vent Flame Arresters

c. Tank vent flame arresters shall be designed, constructed and tested in accordance with ASTM F-1273. Arresters are classed either Type I (end of line) or Type II (in line). The markings must include the following:

- Manufacturer's name or trademark;
- Style, type, model or other manufacturer's designation;
- Size of the inlet or outlet;
- Type of device;
- Direction of flow:
- Test laboratory and report number;
- Lowest maximum experimental safe gap (MESG);
- Ambient air temperature range; and
- ASTM designation F-1273.

5. Equipment Using Liquefied Petroleum Gas (LPG) or Compressed Natural Gas (CNG)

A forthcoming regulation change may permit the use of LPG and CNG for cooking appliances aboard all uninspected vessels, provided ABYC Standards A-1-78 or A-22-78 and pertinent NFPA standards (for CNG) are met, in addition to other requirements of the proposed regulations.

6. Keel Coolers

Most keel coolers are integral parts of the hull (generally, extra-heavy pipe halves or structural angles welded to the bottom of the vessel); independent units known as grid coolers have also been utilized. Keel coolers must be fitted with shut-off valves located at the skin of the vessel, as required by 46 CFR 56.50-96(a), except that a shut-off valve may be omitted if the requirements of 46 CFR 56.50-96 (a) (1) and (2) are met.

7. Sliding Watertight Doors

a. Sliding watertight doors shall be designed, constructed and tested in accordance with ASTM F-1196. The requirements for controls and operating mechanisms associated with the watertight doors are contained in ASTM F-1197. ASTM F-1196 and F-1197 apply only to Class 2 and Class 3 sliding watertight doors. The watertight door shall pass the following installation tests described in the standard:

(1) Visual inspection of the sealing surface for surface defects.

(2) Feeler gauge test - a test of the tightness of the door closure using a 0.003 inch feeler gauge.

(3) Hose test - Water at a hose pressure of 50 psi at a distance of not more than five feet from the door.

(4) Closure test - Using a maximum force of 25 pounds (50 pounds during wedging if applicable):

- A watertight door must close in not less than 20 seconds or more than 40 seconds in power operation mode.
- All watertight doors must close in less than 90 seconds in the manual operation mode.
- All power operated doors must be closed in less than 60 seconds after activation of the master mode switch.

b. The watertight door shall have a nameplate permanently attached to the door on which is stamped the name of the manufacturer, manufacturer's serial number, ASTM specification designation (ASTM 1196), pressure head and date. The nameplate must also include the following additional phrase:

"Suitable for installation in subdivision bulkheads aboard vessels inspected and certified by the U.S. Coast Guard."

INSTALLATION SPECIFIC NOTE: ASTM F-1196 and F-1197 do not incorporate the latest guidance from the International Maritime Organization, Maritime Safety Committee (MSC Circular .541) for watertight doors installed above the bulkhead deck. Watertight doors installed in these locations which do not meet the minimum ASTM standard for a 20 foot design head will be approved by Commandant (G-MSO) on a case-by-case basis.

8. Spill Valves

Spill valves shall be designed, constructed and tested in accordance with ASTM F-1271. Spill valves are no longer approved by the Commandant under 46 CFR 153.365(a)(3). ASTM F-1271 prohibits positive closure of spill valves as a means to prevent the opening of spill valves due to sloshing. For new valves, the old practice of dogging the valves closed while enroute is no longer acceptable. Since 46 CFR 39.20-9(c) requires a means to prevent spillage due to sloshing, an alternative means must be provided. Valves which are presently installed are still acceptable and dogging is still permitted for these valves. However, new ones meeting the ASTM standard are to be installed when replacement is required. The provisions of both the ASTM standard and this regulation may be satisfied by either valve design or design of the valve installation (i.e. tank baffling or stilling well not part of the valve assembly).

a. During the installation of vapor recovery systems, spill valves must be replaced with new ones meeting the ASTM standard. Spill valves are often the limiting factor for a vessel's maximum allowable transfer rate.

b. Markings. The spill valve markings must include the following:

- Manufacturer's name or trademark;
- Style, type, model or other manufacturer's designation;
- Direction of flow;
- Maximum rated flow;
- ASTM designation F1271;
- Relief pressure setting at full flow rating;
- Set (opening) pressure; and
- Indication of the proper orientation of the valve, if critical.

F. MISCELLANEOUS DECK EQUIPMENT

1. Air Breathing Apparatus

Introduction

a. Introduction. Title 46, CFR, Subchapters D, H, I, I-A, R, and U require self-contained breathing apparatus (SCBA) as required equipment on certain vessels. These SCBA must be of the pressure-demand, open-circuit type, approved by the Mine Safety and Health Administration and by the National Institute for Occupational Safety and Health. They must have a full facepiece and an air supply of at least 30 minutes. SCBA not meeting these criteria may be allowed to remain on board, depending on the grandfather clause in the applicable subchapter. Replacements for grandfathered SCBA must be as described above.

Fresh Air Breathing Apparatus

b. Fresh Air Breathing Apparatus. Such appliances approved under subpart 160.011 were required equipment on most tankships. They may continue in use until November 23, 1994, if they were part of the vessel's equipment on November 23, 1992, and as long as they are maintained in good condition to the satisfaction of the OCMI. An examination of such appliances should include the following items:

- Facepiece Cracked or badly scratched faceplate lens? Loss of flexibility? Incorrectly mounted faceplate lens?
- Head Straps Breaks? Loss of elasticity? Broken or malfunctioning buckles? Excessively worn serrations on head straps that may permit slippage?
- Breathing Tubes Broken, missing, or loose connectors? Missing or loose hose clamps? Deterioration? (Stretch tube and look for cracks.)
- Crank Bellows Hose connections tight? Crank available? Operation successful?
- Air Hose Examine entire length for pliability and signs of deterioration, cuts, or cracks; examine connectors.

NOTE: Although vessel requirements specify 45.72 meters (150 ft) maximum lengths, fresh air lines of up to 91.44 meters (300 ft) have proven satisfactory in tests.

SAFETY NOTE: Fresh air breathing appliances that become unserviceable shall be replaced by SCBA described in 46 CFR 35.30-20(c)(1).

SCBA

c. Self-Contained Breathing Apparatus (SCBA). An examination of such appliances should include the following items:

EXAMINING A SELF-CONTAINED BREATHING APPARATUS (SCBA)
CYLINDERS
• Is the cylinder fully charged? • Has the cylinder been hydrostatically tested within the prescribed interval? • Does the cylinder show visible signs of corrosion or damage? • Are they properly stowed?
HOSES
• Do they show signs of deterioration? • Are they properly connected?
FACE MASK
• Is the faceplate cracked/badly scratched? • Is there loss of flexibility? • Cracking at edges of seal? • Incorrectly mounted lens?
HEAD STRAPS
• Are there breaks? • Loss of elasticity? • Broken or malfunctioning buckles? • Excessive wear of head harness serrations that might permit slippage?

2. Reflectorized Signs

Prior approval is not required for the use of "Scotchlite" signs on merchant vessels. The Commandant has no objection to the use of reflectorized signs to mark emergency equipment, instructions, and escape routes. However, such signs must comply with the intent and specifics of the applicable regulations governing required markings. The use of reflectorized signs is subject to any special limitations that may be imposed by the OCMI within whose jurisdiction the vessel is inspected.

G. ELECTRICAL EQUIPMENT

1. Approved Equipment

See section 18.D above concerning electrical equipment considered acceptable for use aboard inspected vessels.

2. Cartridge Fuses

On 4 December 1959, 46 CFR 111.53 was amended to require cartridge fuses, if used, to be of a nonrenewable type; however, this requirement is not retroactive. Thus, inspectors shall encourage the use of nonrenewable cartridge fuses in all cases. Replacement of renewable link cartridges shall be required only for those vessels contracted on or after 4 December 1959.

3. Marine-Type Lighting Fixtures

The Commandant will accept marine-type light fixtures listed by UL for installation on inspected vessels. However, the Commandant may reject any fixture not considered suitable for a specific application. Submittal of drawings to the Coast Guard for approval will not be required for fixtures listed and labeled by UL. However, just because a particular lighting fixture has a UL marine label does not mean that it may be installed anywhere aboard an inspected vessel. For example, in hazardous locations, the fixture must be of suitable explosion proof construction, and must be so labeled. UL listings are divided into three classes:

a. "Outside," used where the fixture will be exposed to the weather or sea conditions;

b. "Inside-dripproof," installed in other wet or damp locations; and

c. "Inside." Where the regulations permit only incombustible materials in passageways and stairway enclosures, only materials such as metal and glass shall be used in fixture housings. Cables used to connect UL marine-type lighting fixtures must have UL listed insulation, to ensure that they are suitable for the operating temperatures of the fixtures.

4. Television and/or Radio Antennas and Radar Installations

The Coast Guard does not regulate installation of television and radio antennas on vessels. Federal Communications Commission (FCC) inspectors may require changes in an antenna installation if it will likely interfere with the proper operation of the vessel's main radio transmitter or receiver. Television antenna installations on inspected vessels are considered to be under the cognizance of the master or a competent crewmember designated by the master (likewise, the FCC has jurisdiction over marine radar installations). Coast Guard inspections shall normally be limited to spot-checking for unsafe and overall safety.

H. LIFESAVING EQUIPMENT

1. General Requirements

Equipment Approvals

a. The navigation and vessel inspection laws require life preservers, exposure suits, ring buoys, lifeboats, life rafts, and certain other types of lifesaving equipment to be approved by the Commandant. This approval must be granted before the equipment is placed aboard the vessel to fulfill requirements for lifesaving equipment. Tests and inspections of lifesaving equipment at the inspection for certification are prescribed in the various regulations. This section and NVIC 2-63, "Guide For the Inspection and Repair of Lifesaving Equipment," should be used as further guides.

Alterations of Approved Equipment

b. In every case when lifesaving equipment or appliances directly connected with them cannot be manufactured to the approved design or specification, substitutions shall not be made until they have been first accepted by Commandant (G-MOC).

Penalties

c. It has become evident that certain lifesaving equipment has been manufactured and sold under approved labels despite its failure to conform to the material specifications or design, or both, as originally approved by the Coast Guard. In the past, such equipment failed to function properly in an emergency or was found to be deficient under service conditions. Such practices will not be tolerated. Those found by a marine inspector shall be brought to the attention of the OCMI and district commander immediately. Steps shall be taken to suspend the approval, as provided by 46 CFR 2.75-40 and 2.75-50, or to invoke the various penalties and sanctions provided, including prosecution under 46 U.S.C. 3318(b). Under 14 U.S.C. 639, manufacturers may be prosecuted for advertising items that have never received Coast Guard approval as having done so.

Lifesaving Installations and Plans for Boat Deck Approvals

d. These are discussed in volume IV of this manual. The approval of the lifesaving and emergency plan is the responsibility of the OCMI. Particular attention should be given to lifeboat locations. Lifeboats should be located away from cargo tanks and preferably in a sheltered location. In addition to embarkation concerns, the lowering and retrieval should be considered. Boat location in relation to the ship's propellers is also addressed in volume IV of this manual.

SOLAS Equivalency

e. The lifesaving equipment requirements in the l983 Amendments to SOLAS may be considered as an equivalent for all U.S. vessels. Proposals to use the 1983 Amendments to SOLAS may be accepted by the Officer in Charge, Marine Inspection, without specific Commandant approval in cases where there is a conflict between the U.S. regulations and the 1983 Amendments to SOLAS. However, lifesaving equipment provided in accordance with SOLAS requirements must still bear a Coast Guard approval number if it is an item subject to approval under 46 CFR Part 160.

2. Lifeboats

Recertified Lifeboats

a. Requests for a reduction in the number of persons a lifeboat is certified to carry are sometimes made to avoid overloading the davits, or because the owners do not wish to equip a boat with food and water beyond the requirements for the personnel aboard the vessel. In such cases, the OCMI may accept such a request if:

(1) The reduced capacity of the lifeboats is adequate to accommodate the personnel aboard.

(2) The old capacity painted on each bow and the thwarts is deleted and the new capacity substituted therefore.

(3) An additional nameplate is affixed to the bow, showing that it has been recertified for a different number of persons. The plate shall also contain the boat's serial number, date of change, port, and the inspector's initials.

(4) The Certificate of Inspection (COI) for the vessel is amended.

NOTE: A request for an increase to the original number of persons for which a lifeboat was approved should be handled similarly. However, the weight of the fully equipped and loaded lifeboat shall not exceed the approved working load of the davits. The lesser capacity that was painted on each bow and the thwarts shall be deleted, and the greater capacity substituted. The original nameplate showing the reduced capacity shall be removed and the vessel's COI shall be amended to reflect the increased lifeboat capacity.

Lifeboat Releasing Gear

b. Lifeboat Releasing Gear.

Mills-Type

(1) The Mills-type releasing gear was approved on 12 January 1943 for installation by the Imperial Boat Co. This releasing gear has no retaining device to prevent the accidental release of the hook attachment if the lifeboat should become momentarily waterborne during launching operations in rough seas. When such arrangements are found on a vessel, they shall be corrected. One satisfactory remedy is to weld a small flat bar to the cheek plate of the lower block.

Steward-Type

(2) The Steward-type releasing gear presents problems similar to the Mills-type releasing gear. It should be likewise checked during each inspection. Retaining devices attached to installations of this type have been found in defective condition or entirely broken off, due to neglect or misuse. New retaining devices, similar to those originally approved for this type of gear, should be installed when unsatisfactory conditions are found.

Rottmer-Type

(3) In some instances, examination of the Rottmer-Type of gear revealed that lifeboat footings had been placed over the releasing gear lever for the disengaging apparatus. This arrangement required the lifting of the footings before the releasing gear could be operated. This practice is unsafe and requires correction. A clear, open space shall be provided in the way of the releasing gear lever. The footings shall be removed from this space, and should be well secured elsewhere in the lifeboat until the lifeboat has been launched and is clear of the ship. A stenciled notice to this effect shall be placed on the footings. At all annual inspections of Rottmer-type installations, particular attention shall also be directed to the center pieces of the universal joints in the releasing mechanism. If the center pieces indicate any undue stress, such as bent lugs or hairline cracks, they shall be replaced with center pieces made from solid bronze. The upper and lower guide bearings of the releasing gear should be thoroughly lubricated. The entire releasing mechanism shall be tested for satisfactory operation. Ship personnel shall be instructed to lubricate the upper and lower guide bearings periodically.

Installations in Existing Lifeboats

(4) When releasing gears are to be welded to the stem, sternpost, or keel of an existing lifeboat, the welding details shall conform to the approved drawings for the new installation. The welding shall be performed by a qualified welder. The plating shall be removed in way of welds to permit the welder to have a clear lead, and to ensure a proper weld. All galvanized surfaces within 5 cm (2 inches) of the work area shall be ground to bare steel. Areas in way of the welded and ground surfaces shall be given two coats of "red lead," zinc chromate, or a similar coating.

Hand-Propelled Lifeboats

c. These are fitted with hand-operated propelling gear that meet the requirements set forth in Regulation 10, Chapter 3 of the SOLAS Convention. They should not be confused with motor lifeboats, which have different specifications and requirements by SOLAS. An oar-propelled lifeboat does not qualify as a hand-propelled lifeboat (see 46 CFR 160.034).

Steel Wire Sea Painters

d. The Commandant does not approve of the use of steel wire, in lieu of manila line, for sea painters. Such wire is not as easy to handle, may be difficult to release under tension, and can develop short ends of wire ("fishhooks") that are injurious to bare hands.

New Nameplates for Lifeboats

e. When a lifeboat nameplate is no longer legible, the inspector shall require it to be replaced. The new plate should normally be obtained from the manufacturer of the lifeboat, and should be similar to and contain the same information as the original. When the replacement cannot be obtained from the manufacturer, a new one should be fabricated under the cognizance of the OCMI. The inspector shall check the installation of the new nameplate, make an appropriate entry in the vessel's inspection files, and stamp the new nameplate with his or her initials. The replacement plate should be made of brass or bronze, and stamped as follows:

Manufacturer's Name _____ Serial No. _____
Length _____ Beam _____ Depth _____
Capacity _____ Cu. Ft _____ Persons _____
Air Tanks _____ Cu. Ft _____ Built _____
Weight of Boat in Condition A _____ and Condition B _____
REPLACEMENT NAMEPLATE
Inspector _____ (initials) CG Port _____
Date _____

Plastic Buoyancy Units

f. Accepted plastic buoyancy units shall be used to replace metal air tanks in lifeboats used on inspected vessels. These units are accepted on the basis of samples, plans, and affidavits submitted by the manufacturer; tests of the product by the Coast Guard; and a check of the manufacturing procedure by a the MSC. When authorized by the Commandant, the MSC may issue an acceptance letter to the manufacturer.

NOTE: Such units are not given approval certificates.

Nameplate

(1) Inspectors may recognize accepted units by the nameplate in the following format:

Type (or Model) _____
Lifeboat Buoyancy Unit
Cu. Ft. _____ Date _____
Wgt
Name and Address of Manufacturer
_____
_____

Acceptance Requirements

(2) Plastic buoyancy units may be accepted for use in lifeboats, subject to the following two conditions:

(a) When used as replacements for metal air tanks in existing lifeboats, the buoyancy units shall be the same size and shape as the metal tanks they replace; and

(b) Each installation shall be satisfactory to the cognizant OCMI.

Repairs to Built-In Side Tanks by Foam-In-Place Materials

g. Certain types of these materials, such as rigid polyurethane, have been authorized for use in repairs to lifeboats with built-in side tanks, as well as for other types of lifeboats, when accepted by the OCMI. Such repairs shall be made in accordance with NVIC 2-63.

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3. Life Rafts, Lifefloats, And Buoyant Apparatus

Repairs & Reconditioning

a. No lifefloats or buoyant apparatus may be repaired or rebuilt for use on inspected vessels without having the original builder's nameplate affixed. This plate must contain the initials of the marine inspector who passed the equipment. Lifefloats or buoyant apparatus shall be examined by a marine inspector before any repair or rebuilding, to determine what work is necessary. If considered necessary, the canvas wrapping may be required to be completely removed for examination of the buoyant material. Periodic inspections shall be made as the work progresses; a final inspection shall be made when the work is completed. Any lifefloat or buoyant apparatus requiring complete or partial recovering, or renewal of the wooden platform shall have an additional nameplate affixed that bears the following data:

REBUILT BY

(Name and Address of Company)

_____

_____

_____

_____

Date _____

Inspected by (Inspector's initials) _____

(1) Lifefloats or buoyant apparatus requiring only painting, renewal of netting, lines, seine floats, etc., shall not be fitted with this additional nameplate. All materials used and procedures followed shall conform to the specifications in 46 CFR 160.027 or 160.010, as applicable.

(2) When large numbers of lifefloats or buoyant apparatus are reconditioned, at least one in every lot of 25 shall be subjected to a drop test and a buoyancy test, as described in the applicable specification. When small lots are reconditioned, one of the items should be tested in this way. If the inspector determines that the condition of the renovated equipment is adequate, the drop and buoyancy tests may be dispensed with. However, the inspector shall require all such tests as deemed necessary, regardless of the number of floats or buoyant apparatus involved. (See NVIC 12-61 for the inspection procedures for approved inflatable life rafts that have been stored for extended periods of time since their manufacture or last servicing.)

Substitutions for Lifeboats

b. Substitutions for Lifeboats

(1) For vessels not making international voyages, 46 CFR 33.07, 75.10-25, 94.10-55, and 192.10-55 permit substitutions of inflatable life rafts in varying quantities, for other types of life rafts, lifeboats, and buoyant devices. When substitutions are made in accordance with these provisions, a vessel shall be equipped with:

(a) On each side of the vessel, one or more davit-launched inflatable life rafts of sufficient capacity to accommodate the total number of persons aboard.

(b) On each side of the vessel, at least one launching device, the operation of which shall require no one to remain aboard. Installations shall meet the requirements of 46 CFR 75.27 and 75.37.

(c) Sufficient float-free inflatable life rafts to accommodate at least half of all persons aboard. On vessels with after and forward accommodation spaces, these rafts shall be divided between the two spaces in proportion to the number of persons normally berthed at each location.

Alternate Arrangements

c. Alternate Arrangements. When persons aboard will have an escape route not requiring them to board inflatable life rafts by first entering the water, or descending to them farther than 4.5 meters (14.9 feet), float-free inflatable life rafts may be substituted for the davit-launched rafts and launching equipment required by subparagraphs 18.H.3.d.(1) above. In addition, a motor-propelled rescue boat, suitable for ocean launching with a davit or other suitable gear by no more than three persons, may be accepted in lieu of one lifeboat aboard vessels of 1600 or less GT.

Life Raft Launching Apparatus

d. Life Raft Launching Apparatus. The number of raft launching devices installed on the vessel, and the number of rafts assigned to each launching device, must be sufficient to put all persons aboard the vessel into life rafts in the water in no more than 30 minutes in calm weather. Rafts shall be distributed equally on each side of the vessel. They shall be stowed in the immediate vicinity of the launching devices, protected from weather and damage. Operation of launching devices shall not interfere with embarkation aids and emergency lighting.

Requests for Substitutions

e. Requests for Substitutions. Under the regulations, all requests for substitutions aboard vessels of 3000 or more GT shall be forwarded to Commandant (G-MOC) for consideration. OCMIs should inform vessel owners and operators that the Commandant will review any request for substitution in light of these requirements. For vessels not making international voyages, equipment meeting equivalent standards, as indicated in paragraph 18.C.11 above, are acceptable.

4. Life Preservers

Cork and Balsa Wood Preservers

a. Cork and Balsa Wood Preservers. The SOLAS Convention requires a life preserver to support the head and turn an unconscious wearer face-up in the water. Cork and balsa wood life preservers manufactured under 46 CFR 160.003 and 160.004 do not meet these requirements. Manufacture of these life preservers ended on 1 July 1965, and all approvals for these items have been terminated. Cork and balsa wood life preservers manufactured prior to 1 July 1965 must have been retired from service by March 11, 1999, regardless of whether or not they remain in serviceable condition. However, they may not be used on any passenger, cargo, or tank vessel built or contracted after 26 May 1965 that is engaged in international voyages and is subject to SOLAS. Further, they may not be cleaned or repaired.

Numbers of Preservers Required

b. On tank, cargo, and miscellaneous vessels, the OCMI shall require one life preserver for each person carried, plus an additional life preserver for each person on watch in the engine room, pilothouse, and the bow lookout station. For example, if the total number of persons carried on a vessel is 43, and 3 persons are carried on watch on the bridge and 3 on watch in the machinery space, the entry on the COI shall be: "50 life preservers, adult."

Stowage on Tank, Cargo, And Miscellaneous Vessels

c. Life preservers shall be stowed aboard these vessels in accordance with applicable regulations. For additional life preservers provided for watchstanders in the engine room, pilothouse, and bow lookout station, any method of stowage that reasonably meets these requirements shall be accepted (i.e., they must be stowed so as to be readily accessible).

Stowage on Small Passenger Vessels

d. Stowage on Small Passenger Vessels. Life preservers shall be stowed aboard "T-boats" in accordance with 46 CFR 180.78. An appropriate number of these life preservers shall be stowed so as to be readily accessible to all hands at their operating stations.

Alternate Marking for Certain Life Preservers

e. Standard adult kapok and foam life preservers have been tested and determined to be suitable for children over 1.45 m (57 in) tall or weighing over 34 kg (75 lb). NVIC 14-92 specifies the manufacturers, model numbers and USCG approval numbers affected by this determination. Since, for standard designs, the 1.45 m/34 kg (57 in/75 lb) cutoff has now superseded the old limit of 41 kg (90 lb), manufacturers will be incorporating this change into their required device markings. The new markings for these select models will now state that these devices are "approved for use on all vessels by persons over 57 in tall or weighing over 75 lb" These alternate markings supersede those previously required by 46 CFR 160.002 and 46 CFR 160.055.

Military-Type Life Jackets

f. Military-Type Life Jackets. The military-type life jacket differs markedly in construction from that of the commercial, Coast Guard approved type. It has numerous leg and collar straps, removable pads in zippered compartments, and twice the number of strap adjustments. Also, the envelope, webbing, and tie tapes are not mildew inhibited. Finally, they are not generally available through commercial sources except as government surplus equipment; as such, their true condition will be questionable. Accordingly, military-type life jackets are not Coast Guard approved and may not be used in lieu of Coast Guard approved personal flotation devices (PFDs). For their use aboard Military Sealift Command (MSC) vessels and Department of Defense (DOD)/National Aeronautics and Space Administration (NASA) instrumentation vessels, see chapter 12 of this volume.

5. Exposure Suits

Walk Stations

a. Certain vessels operating in ocean, coastwise, and Great Lakes service are required to carry exposure (survival) suits for all personnel on board, plus additional suits for each "work station," except where quarters are readily accessible. There is a difference in wording between the "work stations" requirement for exposure suits and the "persons on watch" requirement for life preservers. The older language for life preservers ignores the possibility that people may be on watch or at work in locations away from their quarters other than in the pilothouse, engineroom, or the bow lookout station. For non-typical vessels, such as an oceanographic research vessel with on board laboratories, or a service vessel with shop facilities, each "work station" must be evaluated to determine the number of exposure suits required for persons who work there, but do not live in adjacent quarters. The logic behind each calculation of exposure suits required should be documented in the local vessel file.

NOTE: Although many vessel regulations still use the term "exposure suit," the current approval category for these suits is "immersion suit" and the terms may be used interchangeably.

Exposure Suits in Exempt Areas

b. Exposure Suits in Exempt Areas. If a vessel normally operates in an exempt area, but its COI does not restrict operations to the exempt area, the COI shall be endorsed to require carriage of exposure suits when the vessel is operating in an area where exposure suits are required. The purpose of such suits is to prevent hypothermia through the use of closed-cell foam insulation and watertight integrity of the suit. They should be inspected during the vessel inspection to ensure that they will perform adequately.

Exposure Suit Drills

c. Exposure Suit Drills. 46 CFR 97.15-35 and 46 CFR 199.180 require the master to ensure that each crewmember wears an exposure suit in at least one fire and boat drill per month. The master may conduct lifeboat drills without requiring the donning of exposure suits at his or her discretion, based on existing conditions. However, if the wearing of exposure suits is not required at lifeboat drills, the master shall immediately afterward conduct an exposure suit drill.

Scope of Drill

d. Scope of Drill. A reasonable exposure suit drill requires each crewmember to don a suit and receive a training lecture. This practice ensures that:

- Each crewmember can don an exposure suit properly;
- Each suit is in satisfactory condition and fits properly; and
- The correct number of suits are aboard.
- Following the donning of the suits, the master should have two or three crewmembers perform some relevant physical action, such as moving a life raft, to demonstrate the reduced mobility while in such suits.

Unapproved Exposure Suits

e. A number of questions have been raised regarding unapproved exposure suits that are identical to approved suits, except for lack of inflatable collars. The inflatable collar is not necessary for buoyancy, but keeps the wearer's head in a more upright position. This is considered to lessen the wearer's fatigue and, therefore, increase the wearer's chances for survival. As the inflatable collars are not essential to the buoyancy of an exposure suit, existing suits that do not have them should be accepted for purposes of compliance with 46 CFR 94.41-5(d). This regulation permits unapproved suits in use before 1 November 1980 to remain in service if they are otherwise similar to approved exposure suits. Owners of suits that can be altered by attaching inflatable collars should be encouraged, but not required, to provide them.

6. Davits, Winches, And Falls

Boat Falls

The Commandant has no objection to the use of nylon or polypropylene line for lifeboat falls, provided that the requirements of 46 CFR 33.10-10, 46 CFR 75.33, or 46 CFR 94.33 (as appropriate) are met. All installations must be acceptable to the OCMI. It shall be demonstrated during installation tests that the operation and handling properties of such line are satisfactory for the purpose; strength comparable to the original manila line shall be required. Polypropylene line is acceptable as a substitute for manila line on a size-for-size basis. Both polypropylene and nylon should have black or blue pigments dispersed in them to resist ultraviolet sunlight deterioration.

NOTE: Three-inch circumference polypropylene is acceptable in lieu of 3-1/2 inch manila. **Stainless steel wire is not accepted.**

Lifeboat Winch Systems Over Ride Clutches

b. Over-Ride Clutches. If a winch has been observed to be operating in an unsatisfactory condition such as the winch's hand brake is allowing the load to slip or is failing to stop the load when hoisting a load either by power or hand-cranking, or when lowering a load under the force of gravity, an internal examination of an over-ride clutch system should be required by the inspector. In general it would be unreasonable to expect CG inspectors to perform anything more than a cursory examination of the internal workings of over-ride clutches. The focus of the inspector's attention should be on the operational performance of the lifeboat winch system.

Once a faulty over-ride clutch has been identified by an inspector action to correct its defects will of necessity require the participation of factory experts and servicing technicians. After overhaul of a faulty clutch mechanism, the presence of a marine inspector will again be necessary to observe that the problems have been corrected.

Davit Stopper-Bars for Gravity Davits

c. A primary concern in the arrangement of davit stopper-bars is their ability to be unshipped without having to raise the boat by handcrank or electric power. An acceptable arrangement is one in which the stopper-bars are freed simultaneously with the gripes, as the bars pivot at one end and swing outboard parallel to the tracks when released by a lever on each davit arm. Free and unimpeded lowering from the stowed position must be ensured. Certain arrangements have been proposed to reduce the likelihood of damage by raising the davits against a stopper-bar in place. These should not be used because the stopper-bar cannot be freed easily if the davit arm bears upon it. Clips that do not permit the stopper-bars to be unshipped without lifting the lifeboat are unauthorized modifications to approved equipment, contrary to the regulations, and should be removed whenever found.

Fiege Wire Sockets

d. A fiege clevis socket assembly is installed by seizing the wire near the end, driving a sleeve onto the rope, unlaying the end of the rope, fanning out the strand ends, cropping the hemp core, inserting a tapered fluted plug between the strands, and driving the plug to a solid seat inside the sleeve. The strands are compressed between the plug and sleeve by the tightening action of a covering socket, after which the seizing is removed. There is an inspection hole in the side of the socket through which the wire can be viewed to see if it is fully in place. Close attention shall be paid to these sockets. Their inspection shall include a determination as to the tightness and condition of the sleeve, and a sighting of the inspection hole to ensure that the wire is well up into the socket. Whenever the sleeve is found to be loose or worn, the fitting should be removed and inspected, the wire cropped, and the socket refitted. If the sleeve is worn or distorted, it should be renewed. Care should be taken that the new sleeve is sufficiently long, or has been fitted far enough back on the wire, that the wire end extends to the limit of the socket cavity. The fitting should be proof tested after installation. For further details, see the Aids To Navigation Manual - Seamanship.

NOTE: The use of fiege fittings is discouraged. "Poured" sockets, swaged fittings are more reliable when made up professionally and load tested before use.

Davit Span Wires and Manropes

e. Gravity and mechanical davits are required to have manropes suspended by a davit span wire. However, for davits used for launching enclosed lifeboats, the davit span wires and manropes may be omitted, as they cannot be properly used.

Limit Switches for Gravity Davits

f. Under 46 CFR 160.015-3(k)(2), limit switches must be installed on all gravity davits. Their purpose is to bring the davit winch to a stop before the davit arm strikes the inboard limit of its travel. The final 12 inches of travel are then handcranked. This avoids straining or breaking of the falls. Under 160.015-3(i), the safety factor provided by limit switches is necessary on gravity davits whether the motors for their winches are built-in or portable. The use of a portable powering unit (such as an air or electric drill) does not exempt a gravity davit from the requirement for two limit switches.

7. Considerations for Lifeboat Handling

Blocks

a. The sheave enclosures of lifeboat davits and the blocks of their falls require regular examination for evidence of corrosion and excessive sheave clearance. This must include the floating blocks and the lower part of the tackle attached to the lifeboat. In one reported casualty, extensive corrosion of the steel becket strap on an upper tackle block caused the strap to part when the lifeboat was swung out for a drill. Outwardly, the block appeared satisfactory; however, the strap behind a cheek plate had wasted away. Hidden corrosion of this kind can be detected only through close examination and hammer testing. If the clearance between a sheave and its enclosing cheek plates is excessive, an opening may exist in which the wire rope fall can become wedged. Sheaves on the davit arms and tackles should be viewed through the opening of the enclosure to determine if this condition exists. If so, it is sufficiently serious to require corrective action.

Gravity Davits

b. Examination of gravity davits aboard one vessel revealed an incorrect coil retainer replacement that might have short-circuited the master control switch, and a rearrangement of the controller wiring that might have rendered operation of the limit switches useless. As a result, power to the hoisting motor could have been secured only by opening the emergency disconnect switch. It was also reported that trackway switches were so gummed by paint that the springs which would normally return them to the open position were unable to operate; wheels on the limit switch arms were frozen with paint and rust; rollers on the davit arms were frozen with rust, and that the lettering on the various switches indicating "on" and "off" positions were obliterated by paint. Inspectors shall be satisfied that the ship's crew maintains gravity davits in safe operating condition (see 46 CFR 111.95-7 concerning main line emergency disconnect switches, master switches, and limit switches).

c. Rottmer-Type Releasing Gear on Globe American Lifeboats.

Rottmer-Type Releasing Gear on Globe American Lifeboats

(1) During World War II, the Globe American Corporation manufactured many 24 X 8 foot steel, oar, and motor propelled lifeboats, with built-in tanks. These lifeboats were fitted with Rottmer-type releasing gear, manufactured under license, and most were installed aboard "Victory" ships. Since the war, some of these lifeboats may have found their way to other types of vessels. The Globe American releasing gear employed the use of so-called "aluminum bronze" for the hook lock, upper guide bearing, and lower guide bearing. This particular alloy has an ultimate tensile strength exceeding 100,000 pounds per square inch, but is subject to stress corrosion cracking in the marine environment. This cracking, not always readily discernible, may cause failure of the gear with only the weight of the light boat on the hooks.

(2) Requirements. Vessels fitted with 24-foot Globe American lifeboats shall have all Rottmer-type releasing gear carefully inspected at each inspection for certification. This inspection requires complete dismantling, so that all parts of the gear may be carefully examined. Of particular concern are the hook lock and the upper and lower guide bearings. Any fractures in these items, however slight, is sufficient causes for replacement of the part. Such fractures may not be brazed; any part found to have been previously repaired by brazing shall be replaced.

8. Upkeep of Wire Lifeboat Falls

Introduction

a. A review of casualties involving lifeboats and associated equipment has revealed a number of material problem areas. Failure of wire lifeboat falls accounted for more than 50 percent of these casualties. Recent statistics show that the number of casualties involving the failure of wire lifeboat falls are increasing. The most common cause of wire fall failure is lack of maintenance in areas that are normally inaccessible. Careful examination of these casualties showed that falls parted at inaccessible points in the vicinity of sheaves and guards, or where they remained stationary on the davit sheaves. Additionally, wire falls may be exposed to severe atmospheric conditions, frequent inundations by salt water and spray, and corrosive soot and stack gases. These elements combine with uneven wear to promote excessive deterioration of lifeboat falls.

Maintenance and Lubrication

b. Maintenance and Lubrication.

(1) General. Wire rope falls must be free of broken strands and damaging corrosion, and must be well lubricated along their entire length. Particular attention should be paid to areas where the falls pass through blocks, sheaves, and other obstructed areas. The exposed portions of the wire falls can be lubricated without lowering the lifeboats. However, in places where falls are hidden by blind sheaves or guards, they cannot be properly lubricated without lowering the lifeboats and exposing all sections of the wire rope. Wire rope that has a fiber core may absorb moisture, which causes internal corrosion.

NOTE: Even after lowering the lifeboats, there may be sections of the wire rope that do not move, where it is impossible to lubricate the surface riding hard against the sheave.

(2) Lubricating Options. One way to lubricate unexposed areas of the wire lifeboat falls is to lower the boat a few feet so that these critical spots are clear. Another is to take the load off the falls and free them from the hidden areas in the blocks. These parts of the wire rope should have lubricant thoroughly worked into and completely around the strands. The best lubricants are lightbodied compounds, with rust inhibitors, that have good penetrating properties. These lubricants can be dipped, swabbed, or sprayed onto the wire rope.

c. All lifeboat falls shall be thoroughly examined at least once every 2 years. The marine inspector shall require the lifeboat to be cradled or stopped off, with the load taken off the falls. The surface of the wire rope shall be checked for wear and for the presence of "fishhooks" or splinters. A marlinspike can be passed into the lay of the wire and backed to expose the interior of the wire rope. If there is any doubt about the condition of the falls, they shall be replaced. If they are deemed satisfactory for continued service, but there is some question as to their maintenance in those areas that have been in contact with sheaves or covered by guards, the falls should be end-for-ended.

NOTE: If it is more practicable to cut a few feet from the standing end of the wire falls to reposition those questionable areas, the inspector may accept this action.

Workbooks

d. All maintenance performed on lifeboat falls should be recorded in the vessel's workbook. The inspector should examine these records to determine the age of the falls and whether any shipboard maintenance has been performed since the falls were last renewed.

9. Hydraulic Starting Systems for Survival Craft

General

a. Good safety practices require lifesaving equipment to be properly maintained and ready for immediate use. Under the regulations, the motors of lifeboats aboard inspected vessels must be operated for at least 5 minutes, once a week (see 46 CFR 33.01-15, 33.25-20, 78.17-60, 97.15-45, and 196.15-45). Certain motor lifeboats and survival capsules are equipped with hydraulic starting systems that store power in pressurized accumulators. Occasionally, a system leak occurs when an accumulator loses pressure and becomes ineffective. If the leak is external and allows oil to be lost from the hydraulic system, pumping may not restore system pressure and starting of the engine will be impossible.

Inspection Requirements

b. Masters and persons in charge should routinely examine such hydraulic systems during weekly fire and boat drills to ensure that they do not have leaks that allow the accumulators to discharge. Each accumulator should be at full pressure at the conclusion of the engine test and not lose pressure between tests. A short-term check of the system can be made by bringing the accumulator up to full pressure. After several hours, there should be no noticeable loss registered on the pressure gauge. A minimal interval of 4 hours between tests is recommended, although a 24-hour interval is more effective. Marine inspectors shall check the condition of the hydraulic systems of lifeboats and survival capsules during regular inspections.

10. Emergency Water and Provisions for Survival Craft

Emergency water, provisions, and condensed milk, like all other items of survival craft equipment, are required to be "of good quality, efficient for the purpose they are intended to serve, and kept in good condition." Emergency water, provisions, and canned milk which are overage, or in leaking, rusting, bulging, or otherwise damaged containers, do not meet these standards and must be replaced.

Emergency water

a. Emergency water.

(1) Canned water should be checked for vacuum retention by the "slap test." Any clicking sound is evidence of an acceptable vacuum. Doubtful cans can be checked by opening some of them. If a hiss is heard consistently as these cans are opened, the rest of the doubtful cans may be accepted, and only the opened cans need to be replaced.

(2) Water in flexible pouches should be checked by squeezing the pouch. Any leaking water or air is cause for rejection.

(3) All approved water containers are marked with a packing date, and some may have an expiration date. All containers past their expiration date should be replaced. Containers without an expiration date should be replaced if they have been packed more than five years before the date of inspection.

(4) Lifeboats meeting the 1983 SOLAS Amendments (those with approval numbers starting with "160.135") must carry 3 liters (3.17 quarts) of water per person.

(5) Inflatable liferafts meeting the 1983 SOLAS Amendments (those with approval numbers starting with "160.151") must carry 1.5 liters (1.58 quarts) per person.

(6) Approved desalting apparatus may replace up to 1/3 of the water carried in survival craft. In addition to chemical treatment systems, manually operated reverse osmosis desalinators are now approved to replace the quantity of water they are rated to produce in 48 hours, up to the limit of 1/3 or the water required.

Emergency provisions

b. Emergency provisions.

(1) Canned emergency provisions can be checked only by visual examination of the condition of the container.

(2) Emergency provisions in vacuum-packed flexible pouches should have packaging material tightly compressed against the contents. Loose contents indicate a loss of the vacuum seal, and such pouches should be replaced. Non-vacuum-packed pouches should be squeezed to check for air leakage, as with flexible water pouches.

(3) Expiration Dates. Approved emergency provisions are marked with a packing date, and some may have an expiration date. All packages past their expiration date should be replaced. Packages without an expiration date should be replaced if they are more than five years old. Canned provisions with no dates are well over five years old and should be replaced. None of these undated cans were vacuum—packed, therefore air in the container will cause fats in the provisions to turn rancid over time. If an operator objects to the rejection of old provisions, the operator should be given the option of submitting a sample of the provisions in question to a food laboratory to determine fitness for human consumption.

(4) Lifeboat Regulation. Lifeboats meeting the 1983 SOLAS Amendments (those with approval numbers starting with “160.135”) must carry provisions equaling at least 10,000 kJ (2400 calories) per person.

(5) International Liferaft Regulation. Inflatable liferafts with “SOLAS A” Packs meeting the 1983 SOLAS Amendments (those with approval numbers starting with “160.151”) must carry provisions equaling 10,000 kJ (2400 calories) per person.

(6) Calorie Counts. In order to be consistent with new SOLAS requirements, many emergency provisions will be packed in sizes other than multiples of 3600 calories (1 lifeboat ration) and 1800 calories (1 liferaft ration). Total calorie counts rather than package counts or weights, should be used to determine the minimum amount of provisions required.

(7) Emergency provisions have approval numbers starting either with "160.026" or "160.046". Both are acceptable and may be used interchangeably.

(8) Canned Condensed Milk. Unless otherwise indicated on its container, canned condensed milk is not intended for long term storage, and should be replaced each year during the annual stripping and cleaning of the lifeboat. An operator may be given the option of submitting samples to a food laboratory for determination of fitness for human consumption, if the operator feels that the milk can be carried for an additional year.

(a) Operators should also be given the option of replacing canned condensed milk with approved emergency rations, using 1400 calories as the equivalent of 1 lb. of canned milk.

(b) Lifeboats meeting the 1983 SOLAS Amendments are not required to carry condensed milk.

Substitutions

c. Lifeboats other than those meeting the 1983 SOLAS Amendments should not be permitted to substitute the 1983 SOLAS emergency water and provision quantities unless all equipment in the lifeboat is to the 1983 SOLAS Amendment Standards. Substitutions should not be made in inflatable liferafts, unless part of an approved modification to the manufacturer's servicing manual.

I. FIRE PROTECTION EQUIPMENT

1. Introduction

Tests and inspections of firefighting equipment during the inspection for certification are prescribed in the regulations. This subpart covers situations requiring particular attention or further explanation. NVIC 6-72 and its Change 1 provide additional guidance for the design and review of fixed firefighting equipment aboard merchant vessels. In particular, Change 1 specifies the conditions under which Halon 1301 extinguishing systems are equivalent to CO2 systems. For several years, small Halon 1301 systems have been approved for use on recreational boats, and on uninspected vessels such as tugs and fishing vessels. These units are so marked and bear an approval No. "160.029/--/--." Halon 1301 is not a hazardous vaporizing liquid, so it is not prohibited by 46 CFR 25.30-10(e); it is approved under 46 CFR 25.15 as equivalent to the CO2 system required by 46 CFR 25.30-15(a). These systems should be installed in accordance with approved manufacturers' installation manuals.

Fixed mechanical foam systems shall be required to have a foam analysis completed which certifies that the foam concentrate remains within acceptable parameters established by the manufacturer. At each Inspection for Certification, it is incumbent upon the vessel owner/operator to obtain from the foam manufacturer or his authorized representative documentation which details the specific gravity, pH, percentage of water dilution and solid contents of the foam. The documentation shall also certify the foam suitable for firefighting per requirements as detailed in 46 CFR 31.10-18, 46 CFR 107.235(b)(2)iii) and NVIC 6-72.

2. Excess Equipment

Inspected Vessels

a. For uniformity in the listing of firefighting equipment carried aboard inspected vessels, the COI shall record only the fire hose, fire extinguishers, and other gear required by law and regulations. To compel the recording of excess equipment would effectively compel its carriage on all voyages, even though the regulatory requirements might be considerably exceeded. However, all excess firefighting equipment that is carried aboard an inspected vessel must be of approved types (as required by 46 U.S.C. 3306), tested at inspections, and kept in good operating condition.

Uninspected Vessels

b. Under 46 CFR 25.30-5(b), all fire extinguishing equipment aboard uninspected vessels must be of approved types.

3. Portable Fire Extinguishers

Identification

a. Portable fire extinguishers are identified as approved by one of the following methods:

(1) Presence of a UL, UL of Canada (ULC), or Factory Mutual Research (FM) label on the extinguisher bearing a marine-type marking, such as "Marine Type USCG B-1," "Marine Type USCG Type B:C, Size II," and "Marine Type USCG Type B:C, Size I, Approval No. 162.028/"; or

(2) A make and model number that corresponds to the listing under the manufacturer's name in the "Formerly Approved" section of Equipment Lists.

INSPECTION GUIDANCE: Extinguishers that cannot be identified as types that are approved or previously accepted on a case-by-case basis shall be removed.

Coast Guard Certificates of Approval for Portable Extinguishers

b. Certificates of Approval for portable fire extinguishers are no longer issued by the Coast Guard. All outstanding certificates were terminated on 1 January 1962. From that date, portable extinguishers have been given approvals based on UL listings. All fire extinguishers manufactured while Certificates of Approval were in effect may be used, provided they are in serviceable condition. However, the use of vaporizing liquid fire extinguishers manufactured after 1 January 1962 is prohibited.

Acceptance of UL Listed Fire Extinguishers

c. UL listed extinguishers not bearing Coast Guard marine-type markings are acceptable as equivalent to those bearing such markings, provided that they are of the appropriate types and sizes for their service. NVIC 13-86 provides a table comparing appropriate types and sizes of extinguishers.

4. Semiportable Fire Extinguishers

Substitution

a. Substitution of a required minimum sized semiportable fire extinguisher with smaller units totaling equal or greater capacity is not authorized, because the time required to position and activate a second extinguisher may be too long to prevent a fire from reflashing.

Outside Use

b. Footnotes to 46 CFR 34.50-5(c) and 108.495(b) require doubling the quantity of agent ifthe unit is used outs. This double capacity must be provided by a single unit.

5. Carbon Dioxide Systems

Small Passenger Vessels Uninspected Vessels

a. Small Passenger Vessels Uninspected Vessels

(1) Provisions for the use of a single portable or semiportable CO2 fire extinguisher as a fixed system on small passenger vessels, under certain conditions, are contained in 46 CFR 181.20-5. Vessels built before 1 June 1958 were permitted to use up to two such extinguishers for this purpose, provided controls were capable of discharging both units simultaneously. These installations may remain in use, provided they are maintained in good condition.

(2) Provisions for fixed CO2 systems on uninspected vessels are contained in 46 CFR 25.30-15.

Potential Hazards and Means of Escape

b. Potential Hazards and Means of Escape. Fixed CO2 systems pose a potential hazard to vessel personnel and marine inspectors. A casualty at sea, which was given widespread notice in Commandant Notice (COMDTNOTE) 16711 of 23 August 1978, illustrated the need to ensure adequate means of escape from CO2-served spaces. In this casualty, the chief engineer inadvertently discharged CO2 in a space with an inward-opening door. Crewmembers were unable to open the door until pressure in the space subsided, and some were asphyxiated. Similar accidents have occurred during system testing and servicing. The inspector should ensure that adequate precautions are taken. During servicing, no one should be permitted in spaces served by CO2 unless all CO2 bottles are completely disconnected. During inspections, CO2 storage provisions and means of escape shall be evaluated. Recommended protective measures include outward-hinged doors, kick-out panels in doors or bulkheads, a stenciled warning to lock the door open when the space is occupied, and sufficient vent openings to the atmosphere. Regulation 5.1.13, Chapter II-2 of SOLAS 74/78 also acknowledges these hazards by requiring outward-opening access doors in CO2-served spaces aboard subject vessels.

6. Fire Hose

Markings

a. Markings. Questions have arisen as to the proper marking and testing of fire hoses installed under the provisions of 46 CFR 34.10-10(l), 76.10-10(l)(3), and 95.10-10(l)(4). The prescribed marking consists of the words "Underwriters Laboratories, Inc., Inspected, Rubber Lined (or Unlined) Fire Hose," followed by a serial number. These words appear on a cloth or rubber label permanently affixed to the fire hose. If a fire hose does not bear the UL label, the vessel owner shall provide the OCMI with certified copies of a test report by an independent laboratory, showing that the fire hose conforms to the appropriate specifications noted in the above regulations.

Testing

b. Testing. Questions have also arisen over the recommendations of both UL and the NFPA that lined fire hose never be wetted except for use at a fire. The Commandant believes that the benefits derived from the periodic pressure tests required by regulations outweigh any harmful effects of wetting, provided the hose is properly dried before stowage. Therefore, inspectors should caution shipboard personnel that particular care is necessary to dry fire hose thoroughly after each wetting to avoid deterioration. All new hose placed aboard vessels shall be tested in accordance with the regulations at regular inspection intervals.

Length

c. UL standards call for nominal 50' and 75' lengths for fire hoses designated as "50-ft." or "75-ft." lengths. In most cases, such hose should not be less than 48 feet for the former, 71 feet for the latter. On approximately one out of every ten lengths, a UL inspector will conduct a burst test. The sample used in the burst test will be cut off and used for physical and chemical tests (in no case will this sample be greater than 40 inches in length).

Fire Hose

d. In general, 2-1/2 inch hoses should be limited to use in exterior spaces or large cargo holds, such as on roll-on/roll-off (RO/RO) vessels. When a 4-foot applicator is required at the fire station, only 1-1/2 inch hoses should be used.

Defective Hoses

e. Under 46 U.S.C. 3305, fire hose so defective as to be incapable of repair must be destroyed in the presence of the inspector.

7. Combination Fire Hose Nozzles

New Installations

a. New installations and replacements of combination nozzles shall be of approved types, as required by 46 CFR 34.10-10, 76.10-10, and 95.10-10. The approved types are listed in the Equipment Lists. The 1-1/2 inch/4 ft. applicators are intended for use with 1-1/2 inch combination nozzles in propulsion machinery spaces that contain oil-fired boilers, internal combustion machinery, or oil fuel units. Because of orifice sizes on approved nozzles, neither self-cleaning line strainers nor internal strainers are required.

Existing Installations

b. Certain combination solid stream and water spray fire hose nozzles were previously accepted pending development and adoption of new designs. Those installed on vessels prior to approval of combination nozzles under 46 CFR 162.027 may be continue in service, provided they are in serviceable condition. Self-cleaning line strainers are required with these nozzles, unless they are fitted with internal self-cleaning strainers. The accepted nozzles are:

(1) Types SG-40 and SG-47, manufactured by the Rockwood Sprinkler Co., Worcester, MA; and

(2) FOGNOZL 4-AN and 4-NAP, manufactured by the Akron Brass Manufacturing Co., Inc., Wooster, OH.

8. Fire Main/Foam Cut-Out Valves

Identification

a. Identification. Regulations provide that fire main cut-out valves shall be sealed open, except when closed to prevent freezing. The original provisions for cut-out valves and drains in the fire main were intended to prevent freezing in parts of the fire main system located on weather decks. In more clement weather, the cut-out valves were to be kept open for efficient use of the fire main system in event of emergency. With the advent of dual-purpose ships (those built for easy conversion to military use), the trend has been toward the use of cut-out valves to isolate or cross-connect different sections of fire mains. Therefore, a means for quickly identifying that fire main or foam cut-out valves are maintained in an open position has become necessary. All isolation or cut-out valves should be conspicuously marked and labeled (see 46 CFR 34.10-15(c)). In addition, the fire control plan shall show all isolation or cut-out valves, and shall be permanently displayed for use in an emergency.

Regulatory Intent

b. Regulatory Intent. The intent of the word "sealed" in the regulations was that a seal cannot be easily broken without the use of a key, axe, or chisel, and will indicate that the valve should normally remain open. In addition, it is easy to see whether sealed valves are open or closed. The sealing of these valves in an open position is a function of the vessel's operators. It is not intended that the valves be sealed open by the marine inspector. Therefore, the inspector shall accept seals provided by the vessel's operators to obtain the results intended by 46 CFR 76.10-10(e) and 95.10-10(e).

9. Sprinkler Systems

Introduction

a. Introduction. Many instances have been found where the operation and maintenance of vessel sprinkler systems have not met required standards. Reports of deficiencies for various sprinkler systems show failure in every category: corroded and shorted electrical fittings; frozen and deteriorated mechanical items; piping that was corroded, completely plugged (including the pump suction line), fractured, and air-bound; plugged sprinkler heads and system secured at the pump so it would not have operated automatically.

Inspection Procedures

b. Inspection Procedures. On small passenger or "excursion" vessels, tests and examinations of the sprinkler systems shall be made during the inspection for certification. On large vessels operating on fixed schedules, such tests and inspections may be spread out over the 12-month period under conditions and schedules established by the OCMI and the vessel's owners or operators. All automatic features of wet or dry-pipe systems shall be tested and examined to ensure efficient operation. Each zone shall be thoroughly flushed out with fresh water for a sufficient period of time to clear the system of scale and sediment. The flushing discharge shall be routed through drain valves, test vents, or openings from which sprinkler heads have been removed. As many drain openings shall be provided as necessary to clean the entire system.

Examination of Sprinklers

c. Examination of Sprinklers. Dry-pipe and manually operated sprinkler systems shall be thoroughly drained after tests have been completed. Scheduled checks for accumulated water in dry-pipe systems should be made after the vessel is returned to service. Regardless of the system type, a sufficient number of sprinkler heads shall be removed for examination of both the head and piping, with particular emphasis on dropped heads and low branch lines. The conditions found in this examination will determine to what extent additional removals should be made. After checking and examining the heads, the system should be reassembled, inspected, and checked to ensure satisfactory operation.

Potential Problems & Corrections

d. Potential Problems/Corrections.

- Closed valves in the system (have the chief engineer chain and lock them open if necessary ...no action of the crew should be necessary for system operation).
- Pump won't come on automatically (consider detaining the vessel until problem is determined and repaired).
- No emergency power to the pump (consider detaining the vessel until emergency power is available).
- Flow sensors inoperative, thus incapacitating one zone of the fire detection system (Does the vessel have an additional fire or smoke detection system to cover the same area? If yes, require timely repair, if no, consider detaining the vessel and requiring immediate repair).
- Distribution system piping wasted and holed (discovered because system was not charged to the sprinkler heads). Consider detaining vessel, requiring immediate repair of the piping so sprinkler system can be fully pressurized. If repairs must be accomplished at a shipyard, consider removing passengers and extraneous crew, requiring extra precautions and patrols to protect the crew members who will be remaining on board for the transit.

10. International Shore Connection

International shore connections are subject to the requirements of ASTM F-1121. Fabrication either on board a vessel, in a shipyard, or other shore facility is not precluded by the standard. No specific marking is required by the ASTM standard.

J. NAVIGATION EQUIPMENT

1. Inland & International Rules

Vessels must be equipped with navigation lights and sound-producing devices as prescribed in 33 U.S.C. 1601-1608 (International) and 33 U.S.C. 2001-2072 (Inland). Penalty provisions are contained in 33 U.S.C. 1608 and 2072.

Vessels operating seaward of the demarcation lines described in 33 CFR 80 must comply with the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS). Vessels which are in compliance with the construction and equipment requirements of the International Rules are in compliance with the Inland Navigation Rules Act of 1980 (Inland Rules). The 72 COLREGS became effective on 15 July 1977. The Inland Rules, enacted on 24 December 1980, became effective on 24 December 1981, except for the Great Lakes where they became effective 1 March 1983. Specifications for lights and sound signal appliances are prescribed in the Navigation Rules, reprinted in Navigation Rules, International - Inland, COMDTINST M16672.2A.

2. Navigation Lights

Light Specifications

a. Annex I of the International and Inland Rules specifies navigation light requirements in terms of colors, arcs, ranges of visibility, and position.

Fixtures

b. Fixtures. The regulations applicable to electric navigation lights are contained in 46 CFR 111.75-17. There are no regulations that specifically prohibit the use of non-electric lights, except where the use of open flames is prohibited. However, the requirement in the regulation for a navigation light indicator panel generally precludes use of non-electric lights.

3. Sound Signal Appliances

Annex III of the International and Inland Rules contains sound-producing appliance requirements which are aimed at increasing the mariner's ability to identify targets audibly through the use of different sound characteristics for vessels of different lengths. The sounds produced by whistles, bells, and gongs should all be distinctive so that they are not confused with each other. The sound produced by most whistles is generally shrill, and is accomplished by forcing a stream of air or steam through a circumferential slot into a cylindrical chamber. The tone and sound of a bell must not be confused with those of a gong. Under the Navigation Rules, a "fog horn" is no longer specified as part of the signaling equipment. A fog horn may not be substituted for the whistle required by those rules.

a. Electronic Sound Devices. Annex III 2.(b) specifies that a bell be made of corrosion resistant material and further specifies bell mouth diameter. However, electronic devices which meet the sound requirements may be substituted for the mechanical equivalent if a manual back-up is provided.

Fog Gongs

b. Fog Gongs. The Navigation Rules require fog gongs aboard vessels of 100 or more meters (328 ft.) in length. The sound produced by the gong must be easily distinguished from that of the ship's fog bell, at an equal audible range. The gong shall meet the specifications in Annex III to the Navigation Rules. When there is doubt about the suitability of an instrument, a demonstration shall be conducted under the supervision of the OCMI and a report submitted to Commandant (G-MOC) via the chain of command.

Vessels Less Than 12 Meters in Length

c. Vessels Less Than 12 Meters in Length. These vessels are not required to carry whistles and bells that meet the technical standards in Annex III of the Navigation Rules. However, if no such equipment is carried, the vessel shall be provided with some other means of making an efficient sound signal. Whistles and other sound-producing mechanical devices (e.g., a Freon-operated horn) may be accepted for use aboard vessels less than 12 meters in length, provided they are in proper working condition and produce an efficient sound signal.

4. Technical Requirements

Specific requirements for navigation lights, which are similar for Inland and International Rules, are contained in Annex I to the 72 COLREGS and the Inland Rules. Annex III of the Rules provides technical details of sound-producing appliances.

5. Definitions & Interpretations

The following definitions or interpretations are in addition to those listed in the Navigation Rules (Rule 3 or Annex I):

- "*At or near the side of the vessel*" in Annex I 3.(b) means not more than 10 percent of the breadth of the vessel inboard from the side, up to a maximum of 2 meters.
- "*Existing*" vessel means a vessel built (keel laid or corresponding stage of construction) prior to the effective date of the 72 COLREGS (15 July 1977) or enactment of the Inland Rules (24 December 1980).
- "*Forward masthead light*" is interpreted as describing either a single masthead light or the forward most masthead light on vessels with more than one masthead light (Annex I 2.(g) or 3.(b)).
- "*In front of*" means forward of. Sidelights may be "*in line*" with the forward masthead light, but not "in front of."
- "*Length*" means length overall (LOA).
- "*Masthead light*" is used in the Annex for vessels less than 20 meters in length which are unlikely to have 2 masthead lights.

- "*Measurements*"; all vertical height measurements are to be taken from the center of the lens; horizontal measurements are to be taken from or along the centerline of the vessel.
- "*Normal conditions of trim*" in Annex I 2.(b) means all conditions either loaded or ballast for ocean voyages.

6. Extensions To facilitate the transition from the old International, Inland, and Western Rivers to the new International and Inland Rules, certain exemptions or extensions were provided. Rule 38 in both Rules authorized an extension period of 4 to 9 years from the effective date of the Rules to bring the vessel into compliance with some of the more significant rule changes. The time allowed by these extensions has been considered sufficient to bring existing vessels into compliance. There are not provisions in the Rules for further extensions or exemptions. The Coast Guard does not have the authority, except as provided for under Certificates of Alternative Compliance (CACs), to waive any requirements.

7. Exemptions

a. An exemption from the requirements of International Rule 23 (a) provided they comply with the Inland Rule 23 (a)(i) by carrying a masthead light as far forward as practicable, has been issued to. All commercial, recreational and public vessels less than 20 meters which are:

(1) Inspected vessels;

(2) Federally documented;

(3) Registered with a state;

(4) Public vessels; or

(5) Built in the United States and intended for sale in the United States or its territories.

b. This exemption applies retroactively to vessels built before issuance of this waiver. Specific information about this exemption is contained in COMDTINST 16672.4 of 11 May 1993.

8. Problems in Compliance with Light Require-ments

The new Rule requirements have posed certain problems relative to "existing vessels":

Ranges

a. The range requirements for most lights have increased under the new sets of Rules; the relationship between range of visibility and luminous intensity has also changed. However, many lights on existing vessels were much brighter than originally required and may meet the new Rules.

Color

b. Color coordinates for green lights have been narrowed from those required for "existing vessels." This has resulted in a shift toward a bluish tint in the manufacturing of "green" dyes for navigation light lenses. The most commonly manufactured green plastic dyes do not have good ultraviolet stabilization; constant exposure to solar ultraviolet radiation will alter the green tint in a few years. This may be beneficial, in that it moves the color coordinates of an older light lens into the region required by the new Rules. It may also move them beyond the acceptable region.

NOTE: Tests will determine the color coordinates of the lens only at the time of testing, as navigation lights are constantly exposed to ultraviolet radiation.

Horizontal Sectors

c. Annex I of both sets of Rules gives specific arcs in which certain intensities of light are required. For example, sidelights as fitted on the vessel must show the minimum required intensities in the forward direction. The intensity must decrease to reach "practical cut-off" (i.e., one-eighth of the minimum required sector intensity) between 1 and 3 degrees outside the prescribed sectors. Prior to adoption of the 72 COLREGS and Inland Rules, lights were "eyeballed" for a "reasonable decrease" in intensity at the sector boundaries; no values were assigned to the intensity in the cut-off region. The new Rules state that the lights must achieve the specified cut-off as fitted. In the forward direction, the 72 COLREGS require sidelights, as installed, to reach practical cut-off between 1 and 3 degrees outside the prescribed sector. The 72 COLREGS have been interpreted as requiring the intensity between 0 and 1 degrees outside the prescribed sector to be greater than the practical cut-off value. This allows both sidelights to be visible dead ahead of the vessel at a distance dependent upon their separation. This may present a problem for some vessels. For example, containers stacked forward of the sidelights could act as large screens, preventing the 1 degree spillover. A CAC is not appropriate in such cases; the lights should be relocated or the obstruction removed.

Vertical Sectors

d. Annex I of both sets of Rules also establishes requirements for vertical sectors of navigation lights. Previously, this parameter was not even considered. Consequently, "existing vessels" may not be in compliance.

Masthead Separation

e. Masthead lights must be separated by a horizontal distance of one-half the length of the vessel but need not be more than 100 meters (Annex I 2.(b)). Most vessels with a midship house were built with the after mast located amidships and will not meet this separation requirement without moving the mast(s). Also, moving the after mast from the midship house to the after house generally requires the after mast to be higher than original to meet height separation requirements. For this reason, Rule 38 exempted vessels under 150 meters (492.1 ft.) and gave larger vessels 9 years to comply. This extension was made with two-house vessels in mind and in consideration of the economic hardships involved with moving/raising masts. Therefore, CACs should not be granted for masthead separation unless moving the masts would interfere with the special purpose of the vessel.

Sidelight Placement

f. Sidelights must not be "in front" of the forward masthead light (Annex I 2.(g), 3.(b)). This rule also applies to single masted vessels and will require sidelight repositioning on many vessels in the 20-50 meter range. Some vessels (i.e., tugboats, workboats, or fishing vessels) may qualify for CACs due to the special purpose of the vessel.

Sidelight Screens

g. Sidelight screens must be painted matte (flat) black to comply with the 72 COLREGS/Inland Rules. Under Inland Rules, a vessel less than 20 meters in length needs to be fitted with screens only if they are necessary to bring the sidelights into compliance with the horizontal sector requirements of the Inland Rules.

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9. Certificates of Alternative Compliance (CACs)

Regulations give provisions for alternative compliance with the 72 COLREGS in 33 CFR 81.5 (International) and 33 CFR 89.5 (Inland). CACs are intended only for U.S. vessels which cannot fully comply with the Navigation Rules. These are available for vessels of special or unique design which cannot meet the Rules without interfering with their mission. CACs cannot be used as a means for granting an extension of time for compliance.

Issuance of CAC's

a. Issuance of CAC's. The authority to issue CACs has been delegated to the chief, marine safety division at each district office for the purpose of permitting closer review of the actual vessel and to make Headquarters available for appeals. Since the potential for a lack of uniformity between districts exists, communication between districts is strongly encouraged. Certificates should include the information required in 33 CFR 81.9 or 89.9 and a copy of the certificates forwarded to Commandant (G-MOC-2), along with a copy of the Federal Register notice required by 33 CFR 81.18. After review by Commandant (G-MOC-1), the certificates will be filed with Commandant (G-NSR-3). Any questions or unusual cases should be referred to Commandant (G-NSR-3) for Rules (both Inland and COLREGS) interpretation; Commandant (G-MOC-1) for inspection and compliance; or Commandant (G-MTH-2) for technical assistance and fixture approvals.

"Class" Certificates

b. "Class" Certificates. When an owner has several vessels of the same general configuration which would qualify for a CAC, a "class" certificate may be issued. The CAC should be issued listing a representative vessel name and class with an addendum listing all other vessels in the class. The vessel owner is responsible for posting certified copies of the certificate on the bridge of each vessel.

c. Typical Vessel Types.

Offshore Supply Vessels (OSVs)

(1) Offshore Supply Vessels (OSVs). The majority of CACs have been issued to OSVs where full compliance would have required placement of the after masthead light on the centerline between the midpoint of the vessel and the stern. This would severely interfere with the vessel's purpose.

Tugboats, Workboats, And Fishing Vessels

(2) Tugboats, Workboats, And Fishing Vessels. The forward mast (or only mast) of smaller workboats (i.e., tugs and fishing vessels) is often required to be located behind the deckhouse due to the special nature of the vessel. Full compliance would require placing sidelights aft of the foremast. This may present "glare" problems or otherwise interfere with the special nature of the vessel. A CAC may be issued when the vessel owner adequately demonstrates that sidelights are in the closest possible compliance without interfering with visibility or the purpose of the vessel.

Other Vessel Types

(3) Other Vessel Types. Other vessel types warranting alternative compliance may include a ferry with an off-center deckhouse, an aircraft carrier, or certain mobile offshore drilling units (MODUs).

10. Compliance Responsibility

72 COLREGS (as well as Inland Rules) compliance is the responsibility of the vessel operator/owner. Under international treaty, each signatory nation is responsible for enforcing the Rules consistently. Therefore, the Coast Guard will take corrective action whenever discrepancies are noted.

11. Inspection Enforcement Action

Special inspections to determine compliance are not required and Coast Guard resources are generally insufficient to conduct special examinations solely for Rules verification. However, when Rules discrepancies are noted or reported, they shall be further investigated. During routine inspections (annual or COI), inspectors should include Rules requirements in the inspection scope and assess compliance by interviewing the master/vessel representative and by visual/audible verification.

12. Compliance Verification

Individual testing of sound and light appliances, as installed, is the best means of verifying compliance. Obviously, this is not practical in all situations nor possible without sophisticated measuring equipment and/or extensive surveys. For example, bells or gongs may comply with the Annex III requirements at the time of manufacture, but placement, mounting, and painting all affect final sound emissions. Therefore, demonstration of compliance will be the owner's responsibility when compliance is in question. The following guidelines for compliance acceptance/examination apply:

Foreign Vessels

a. Foreign Vessels. Foreign vessels holding valid SOLAS Safety Equipment Certificates (SECs) will be considered in compliance with the 72 COLREGS, unless obvious discrepancies are noted.

Existing U.S. Vessels

b. Existing U.S. Vessels. Existing U.S. vessels will be considered to comply unless obvious discrepancies are noted. Rules inspections will be conducted as a part of regularly scheduled inspections. Special plan review or equipment affidavits will not normally be required for existing vessels.

New U.S. Vessels

c. New U.S. Vessels. Plan review for new U.S. vessels will include navigation light placement and equipment approvals. Review or approval by ABS is considered acceptable evidence of compliance.

13. Non-Compliance Actions

Vessels not in compliance should be issued deficiency notifications. Appropriate entries must be made in the Marine Safety Information System (MSIS). Deficiencies for foreign vessels and U.S. vessels should be issued via a violation report (MSIS Marine Violation Report Recommendation (MVRR) Product). In general, the unit may issue a letter of warning within the first year of the violation if corrective action is already scheduled. Stronger action may be warranted based on the operator's prior deficiency record, prior notice of the Rule requirements, and/or no planned corrective action. Unless the violation is considered a safety hazard, a reasonable time should be allowed for corrective action (i.e., next drydocking or yard period) before imposing operating restrictions.

14. Approved Equipment

Listings of approved navigation light fixtures and sound devices, for vessels over 20 meters in length, may be obtained from Commandant (G-MSE).

NOTE: Some approved "white" lights utilize a grayish tint lens to help prevent excess spillover and glare.

K. MARINE SANITATION DEVICES (MSDS)

1. Introduction

Section 312 of the Federal Water Pollution Control Act (FWPCA), as amended (33 U.S.C. 1322), requires MSDs to prevent the discharge of untreated or inadequately treated sewage into U.S. waters. It requires a certified operable marine sanitation device (MSD) on every vessel with an installed toilet. Installed toilets that are not equipped with an MSD, and that discharge raw sewage directly over the side, are illegal. Section 312(g)(2) of the FWPCA directs the Coast Guard to certify MSDs and 33 CFR 159 sets out equipment construction and operation requirements. In addition, the MSD must be in operable condition to the satisfaction of the USCG boarding officer. A vessel with no installed toilet is not subject to the provisions of section 312.Marine Sanitation Devices are "certified," not "approved," for two reasons. First, MSDs are required on all vessels, not only USCG inspected vessels. Second, MSDs are tested for compliance with the Environmental Protection Agency (EPA) effluent regulations and standards as required by the FWPCA, and do not always meet the USCG marine and electrical engineering regulations of 46 CFR Subchapters F and J. MSD certifications will note whether the MSD is certified for inspected vessels or uninspected vessels.

2. Classification

The USCG recognizes three MSD equipment classes. It is vital to recognize that an MSD type is based on the equipment installation. For example, a malfunctioning flow-through discharge device that has a closed overboard discharge valve is NOT a no-discharge device. It is a broken machine.

Type I

a. Type I. A flow-through discharge device that, under the test conditions described in 33 CFR 159.121, produces effluent having a fecal coliform bacteria count no greater than 1000/100 milliliters, and no visible floating solids. A Type I MSD is commonly a physical/chemical type (macerator/chlorinator).

Type II

b. Type II. A flow-through discharge device that, under the test conditions described in 33 CFR 159.121, produces effluent having a fecal coliform bacteria count no greater than 200/100 milliliters, and suspended solids no greater than 150 milligrams/liter. A Type II MSD is commonly a biological (aerobic digestion) plant, but several physical/chemical plants are certified as Type II MSDs.

Type III

c. Type III. A device designed to prevent the overboard discharge of treated or untreated sewage, or any waste derived from sewage. Most Type IIIs are holding tanks, but there are also vacuum collection systems, incineration systems, recirculation systems, and a composting system.

3. Applicability

Vessels with installed toilets must install an operable, certified MSD, as follows:

Vessels 65ft in Length

a. Vessels 65 feet in length and under must have a Type I, II, or III device (Type I MSDs are still permitted on new installations because of a USCG waiver issued by Federal Register notice of Monday, 10 July 1978.); and

Vessels over 65ft in Length

b. Vessels over 65 feet in length must have a Type II or III device. Type I devices are permitted only if:

(1) The construction of the vessel was begun on or after 30 January 1975 and the MSD was installed prior to 31 January 1980; or

(2) The construction of the vessel was begun before 30 January 1975 and the MSD was installed before 31 January 1979 (extended from 1978 to 1979 because of a USCG waiver issued by Federal Register notice of Monday, 28 November 1977).

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4. U.S. Coast Guard Certification

Certification questions should be directed to Commandant (G-MOC. All modifications to certified MSDs must be reviewed and accepted by Commandant (G-MOC). Initial certification is accomplished in accordance with 33 CFR 159, by one of three methods:

Lable Certification

a. MSDs manufactured after 30 January 1976 have been process tested by the USCG and have a label that identifies the certification number (as in "Certification No. 159.15/xxxx/xx/[I, II, III]"). This label will indicate whether the MSD is certified for use aboard inspected or uninspected vessels. "Equipment Lists," COMDTINST M16714.3, identifies label-certified devices.

NOTE: As of January 4, 1990, the MSD certification information has been incorporated into the Marine Safety Information System (MSIS) computer data base. This means that new certification numbers had to be assigned in the same format as Coast Guard approval numbers (e.g., 159.15/1005/4/II is now 159.015/504/0 and 159.15/1105/4/II is now 159.015/584/0; see figure 18-1). Model names have not changed and formerly assigned numbers are still acceptable for use.

Letter Certification (33 CFR 159.12)

b. MSDs made on or before 30 January 1976 were not process tested to the FWPCA requirements. These older plants, and some custom-built systems, may be certified under 33 CFR 159.12(c), by Coast Guard letter to the manufacturer or vessel owner. A copy of the letter should be kept aboard the vessel as evidence of compliance. These MSDs can not be labeled under 33 CFR 159.15.

FIGURE C2-1: MSD CERTIFICATION NUMBER

CONVERSION SYSTEM

For certification numbers for 159.15 / 1001 / - / - to 159.015 / 1099 / - / - :

Old certification #: 159.15 / 1005 / 4 / II

(delete): : : : : : x x : : : x x

(add): : : : 0 : : : : 0 : 0

New certification #: 159.015 / (0)504 / 0 = 159.015 / 504 / 0

or certification numbers for 159.15 / 1100 / - / - to 159.15 / 1199 / - / - :

Old certification #: 159.15 / 1105 / 4 / I I

(delete): : : : : : x x : : : x x

(add): : : : 0 : : : : 8 0 0

New certification #: 159.015 / (0)584 / 0 = 159.015 / 584 / 0

Certification by Regulation (33 CFR 159.12a)

c. Type III MSDs that store only sewage and flushwater at ambient air pressure and temperature are certified by definition. There will be neither a label nor a letter, so the inspector should verify that the installation is as it is claimed. (Section 18.K.8 addresses precautions for inspecting holding tanks.) The tanks should be adequate to retain the wastewater generated while the vessel is within U.S. waters. Gray waters and galley wastes should not be directed to such a system, because the rotting food can cause the tank contents to putrefy, worsening the situation. The following are not acceptable as being a Type III MSD: (1) use of piping as a holding tank or (2) securing the direct overboard discharge piping from the head with a valve.

NOTE: Type III systems installed on a vessel before 30 January 1975 are certified under 33 CFR 159.12(b). These devices were not reviewed; no certification letter or label is necessary.

5. IMO Certificate of Type Test

A foreign flag vessel that has a "Certificate of Type Test" under MARPOL Annex IV indicating that its sewage treatment plant meets the test requirements of Resolution MEPC.2(VI) of the International Maritime Organization (IMO) will be accepted by the Coast Guard as being in compliance with 33 CFR 159.7(b) or (c). Such a plant will be considered as fully equivalent to a Coast Guard certified Type II MSD (NVIC 9-82, CH-1, dated 8 October 1988) as long as the unit is in operable condition. U.S. registered vessels will continue to be required to have Coast Guard certified MSDs per 33 CFR 159.

6. Pre-construction Technical Review

Label-Certified MSD

a. Label-Certified MSD. If the label indicates certification for installation on inspected vessels, no further review of the unit itself is required, but any surge tanks or transfer station components should be examined prior to installation. If the label indicates that the MSD was certified initially for installation aboard uninspected vessels only, it must undergo plan review by the Marine Safety Center (MSC), the office responsible for the plan review of the particular vessel.

Capacity of the MSD

b. Capacity of the MSD. The regulations let the manufacturer determine how MSD capacity is stated. As a result, MSD manufacturers have used widely varying per capita sewage estimates in calculating the capacity of their equipment, from 35 liters per day to 35 gallons per day. In a proposed new installation, verify that the unit is large enough, based on hydraulics and waste load, not numbers of people, to process the wastewater expected to be generated on board the vessel. Installing too small an MSD will allow the discharge of partially treated sewage, which violates the FWPCA.

Modifications

c. Modifications. All modifications to fixed sanitary plumbing or the MSD system must be accepted by the cognizant OCMI.

Jurisdiction for Review

d. Jurisdiction for Review. The vessel owner is responsible for complying with other agencies that may have jurisdiction. The Public Health Service (Interstate Transportation Sanitation Service) also conducts preconstruction reviews on U.S. vessels.

7. Inspection of Installed MSDs

Marine inspectors should accept certified, operable MSDs that meet the requirements of 33 CFR 159. Ensure that all MSDs on the vessel are included in the inspection. Large vessels may have several MSDs, both holding tanks and flow-through MSDs.

Certification

a. Verify that a device is certified by checking labels, letters, manuals, etc. A copy of the certification letter for an "existing" MSD should be kept on the vessel for review by a boarding officer. This system is imperfect at best. A foreign flag vessel should keep a copy of the IMO Certificate of Type Test aboard (see section 18.K.5). If a letter or IMO Certificate of Type Test is not available, contact G-MOC-3. They may be able to identify the MSD as one that has been letter certified or listed with IMO.

Operation of Type I or II MSD's

b. Verify that an MSD is operable.

(1) Flow-Through Discharge MSDs (Type I or Type II). Verify the following:

(a) Instruction manuals should be on board and available to the operating crew.

(b) Disinfectant chemicals or other consumable supplies needed to operate the device are stocked on the vessel. "Hazardous substances" (46 CFR 147) used to process sewage must be labeled and handled as such.

(c) All components are in good operating condition. Some ships may install the treatment tank in a separate compartment from the pumps and aerators, due to space constraints.

(d) Capacity is adequate for the vessel's wastewater load.

(e) The MSD receives only drains that it can handle. MSDs are tested only with sewage. Gray water drained to the plant can displace partially treated sewage.

(f) No suspicious accumulations of liquid or leaks are around the treatment plant.

(g) Any disinfectant dosing openings are accessible and can be easily opened.

(h) Vents from the MSD do not cross-connect with other vents.

Operation of Type III MSD's

(2) Holding Tanks (Type III). Verify the following:

(a) Capacity is adequate for the time the vessel will have to retain sewage and flushwater.

(b) Tank is used solely to store sewage and flushwater. In older ships, toilet drains may be combined with deck, sink and shower drains, to help flush the overboard drains. This installation was never intended to store sewage and may not be plumbed to prevent the back-venting of fumes from a holding tank.

(c) Tank does not receive gray waters or galley wastes. Adding these wastes can greatly increase the hazards of putrefied material accumulating in the tank.

(d) Tank operates at ambient pressure. Vacuum collection systems therefore cannot be certified under 159.12(a) and must be submitted for engineering review.

(e) Tank operates at ambient temperature.

(f) Vents from the MSD do not cross-connect with other vents.

(g) The overboard discharge valve ("Y" valve) for the tank is adequately secured to prevent the discharge of raw sewage while the vessel is in U.S. waters.

MSD Capacities

d. Check that the MSD can successfully operate in the installation. These calculations shall be used as guidelines, as 33 CFR 159 does not mandate capacities. Each MSD should be evaluated in terms of the vessel's size, route, service, and particular circumstances. These capacities consider only "black-water" toilet drains. (on the average, each person will produce 1.5 liters of waste per day).

Flush Rate

- Figure 18-2 estimates the water used per flush by different toilet systems.

Wastewater Produced

- Figure 18-3 estimates the liters of wastewater produced per person per day, based on the plumbing type, and the way the boat operates.

Gray Water

- Figure 18-4 estimates the liters of "gray water" from galleys, showers and sinks produced per day, based on the way the boat operates. Gray water discharge is prohibited only in the Great Lakes. Gray water is NOT sewage and may be discharged overboard without passage through an MSD or a holding tank. In fact, draining galley wastes into the MSD is not recommended, because food waste is much more difficult to decompose than the human sewage which the marine sanitation device is intended to handle. If retained, gray water must be included in the waste retention capacity for the vessel.

Operation in Excess of Certified Rating

e. A flow-through (Type I or II) system may be overloaded. This "short circuits" the MSD and wastewater flows through the unit too fast to be treated, allowing the direct overboard discharge of untreated sewage through the MSD.

FIGURE C2-2

APPROXIMATE FLUSH CAPACITIES FOR VESSEL TOILETS DRAINING TO MARINE SANITATION DEVICES (MSDS)

System Type	Liters per flush
Conventional (Flushometer)	18.9
Recirculating	0.38
Vacuum	1.1
Hand Pump	1.9
Electric Pump	3.8

FIGURE C2-3

LITERS OF WASTEWATER PER PERSON / PER DAY BASED ON PLUMBING TYPE

Trip Length	LONG[1]		MEDIUM[2]		SHORT[3]	
User	Crew	Passenger	Crew	Passenger	Crew	Passenger
Plumbing System Type						
• Conventional	96.10	96.10	96.10	31.40	48.10	24.00
• Recirculating	1.90	1.90	1.90	0.64	0.95	0.95
• Vacuum	7.20	7.20	7.20	7.20	3.60	1.90
• Hand Pump	11.00	11.00	11.00	3.80	7.40	2.70
• Electric	20.40	20.40	20.40	6.80	10.20	5.10

Note 1: Crew and passengers aboard 24-hour/day.

Note 2: Crew aboard 24-hour/day; 2 groups of passengers aboard for 4 hours each (2 trips/day), each passenger using facilities once.

Note 3: All crew aboard 12 hr/day; 6 groups of passengers aboard for 2 hours (6 trips per day), one fourth of passengers using facilities once.

FIGURE C2-4

LITERS OF GRAY WATER PER DAY						
Duration	LONG[1]		MEDIUM[2]		SHORT[3]	
User	Crew	Passenger	Crew	Passenger	Crew	Passenger
Gray Water	113.6	113.6	113.6	56.8	11.4	5.7

Note 1: All crew and passengers aboard 24-hour/day.

Note 2: All crew aboard 24-hour/day; 2 groups of passengers aboard for 4 hours each (2 trips per day), each passenger using facilities once.

Note 3: All crew aboard 12 hr/day; 6 groups of passengers aboard for 2 hours (6 trips per day), one fourth of passengers using facilities once.

Stability of Small Passenger Vessels

e. Stability of Small Passenger Vessels. Vessel stability must be considered in MSD installation aboard a small passenger vessel. This is especially important for vessels fitted with holding tanks, which, when partially full, may add significant free-surface effect. The OCMI should ensure that the requirements of Subchapter T are met.

Vessel Operations

f. Vessel Operations

Time Within U.S. Waters

(1) Time Within U.S. Waters. The MSD is required while the vessel is within the three mile limit. A Type III MSD can have a through hull "Y" valve, but it must be opened only when the vessel is beyond U.S. waters. The valve must be adequately secured in all U.S. waters to prevent all discharges of raw sewage. Use of a padlock, non-releasable wire-tie, or removal of the valve handle would be considered adequate securing of the device. The method chosen must be one that presents a physical barrier to the use of the valve.

No Discharge Zone

(2) No Discharge Zone. Operation in EPA designated No Discharge Zones affects the MSD installation on every vessel that enters or stays in those waters. Flow-through devices are permitted if adequately secured to prevent discharges of any sewage, treated or untreated. Closing the seacock and padlocking, using a non-releasable wire-tie, removing the seacock handle would be sufficient means of securing. Locking the door to the head with a padlock or a door handle key lock is another acceptable method of securing the MSD while in a No Discharge Zone. However, Type III MSDs are recommended for long-term operation in a No Discharge Zone. Owner/operators should determine whether the intended area of operation is a No Discharge Zone.

Plumbing System Leakage

(3) Plumbing System Leakage. A greater capacity MSD may be necessary to accommodate the water from leaky toilet valves. Fixing the plumbing is often easier.

Effluent Sampling

g. Effluent Sampling. Under the law, it may be necessary to take a sample of the MSD effluent if the marine inspector suspects that the MSD is no longer operable. If this becomes necessary, the marine inspector should instruct the vessel owner to have the effluent sample taken by a qualified wastewater laboratory, with the results reported to the USCG. These analysis results may form the basis of an enforcement action resulting in a civil penalty, so only qualified personnel should take, transport, or analyze the MSD effluent. The USCG can use any wastewater lab that is state-certified.

Jurisdiction

h. Jurisdiction. The vessel owner/operator is responsible for complying with other agencies that may have jurisdiction. For example, foreign passenger vessels calling at U.S. ports are subject to USCG quarterly control verification boardings. The Public Health Service (Centers for Disease Control) also inspects the sanitation of passenger vessels calling at U.S. ports.

8. Precautions for Inspections of MSDs

SAFETY WARNING!

- **Exercise Confined Space Entry precautions when working around an open or suspected damaged MSD.**
- **If samples must be taken by a boarding officer, the boarding officer should wear disposable gloves to protect from possible contamination from the effluent.**
- **Use "Not Safe For Hot Work" precautions around MSD/Holding Tank.**

- Use confined space entry precautions if it is necessary to open a holding tank or MSD. An MSD that has broken while containing sewage can be a hazard to all involved in its repair or inspection. Both methane and hydrogen sulfide can be generated in a treatment plant once aeration is lost.
- A properly operating aerobic digestion MSD does not have a bad smell. A bad smell indicates that part of the system is leaking or septic.
- Be alert for discolored metal fixtures. Hydrogen sulfide gas will blacken brass or other metal, even where it is seeping from the MSD at extremely low (not lethal) concentrations.
- Inspectors are not expected to risk their health to check the MSD. If the MSD is too filthy at the time of inspection, get somebody else to clean it up before you proceed with the inspection.

- Effluent sampling should be done only by personnel who are trained in collecting and handling the water samples. If effluent sampling is advised, inspectors should require the vessel operator to have samples taken by personnel from a qualified water quality laboratory.

9. Portable Toilets

Introduction

a. Introduction. Portable toilets or "porta-potties" use no installed water, power, etc. Portable toilets are not considered installed toilets and are not subject to the MSD regulations. But they are subject to disposal regulations which prohibit the disposal of raw sewage within territorial waters (3 mile limit), the Great Lakes, or navigable rivers. Their use in combination with a direct discharge toilet will not bring a vessel into compliance. Vessel owners may remove the vessel's installed toilets, and use portable toilets instead. If a vessel is fitted with and is using a portable toilet, any fixed toilets aboard that do not comply with 33 CFR 159 must be made permanently inoperable. Only when total removal of the system would be impractical or unsafe may the toilet be rendered "permanently inoperable," meaning that all parts of the toilet are removed (unless removal of a particular part would be impractical or unsafe).

Temporary MSDs

b. Temporary MSDs. The MSD requirement is intended to remove all uncertified toilet installations aboard vessels. This policy must not be construed to permit installing a spectacle flange on discharge valves, or blanking off discharge lines on direct discharge toilets. These are temporary means of preventing overboard discharge that do not render the system permanently inoperable. They do not change the installed system, and the reasonable conclusion is that the vessel owner intends to use the uncertified, installed system later.

Installation

c. Portable systems, if used on inspected vessels, must meet the following criteria:

(1) The device must be manufactured of a durable material, such as molded plastic, aluminum, etc., that facilitates its removal ashore. Collapsible units with disposable bags are not acceptable, because the bag can tear and release sewage into the vessel or into the water.

(2) The vessel operator must follow the manufacturer's instructions for waste disposal, chemical additives use, etc.

(3) The device must be securely fastened to the vessel with straps, wooden framing, or similar materials.

10. Waiver of MSD Requirement

Some unique vessels may be granted a waiver of the MSD requirement. Such waivers are limited and are granted only by Commandant (G-MOC-2). Requests for waivers will be considered only on the basis of space or power constraints that prevent the installation of any commercially available MSD. A lack of pump-out facilities in the vessel's immediate area of operation is not sufficient grounds for a waiver, unless the vessel regularly travels outside U.S. territorial waters, where overboard discharge of raw sewage is permitted. Portable toilets may then be substituted.

L. UNIQUE VESSEL EQUIPMENT AND MATERIALS

1. Introduction

Modern technology and automation are markedly changing shipbuilding practices. Virtually every new vessel contains some novel feature that requires attention at certain intervals after the initial certification. Such items include:

a. Reheat boilers;

b. High expansion foam systems;

c. Carbon monoxide analyzers;

d. Special steels; and

e. Certain automated systems.

This situation is also true in the case of existing vessels that have been rebuilt, converted, or modernized to a limited extent by periodic alterations. The inspector must have access to the information concerning such features, as well as proper inspection and testing data.

2. Records

A description of any unique equipment or materials shall be listed in MSIS. For each piece of equipment or material, an appropriate entry should indicate where information on proper inspection and testing procedures is located. The entries shall be made when the equipment is installed, on the occasion of a new vessel's initial inspection for certification, or whenever necessary.

M. POWER-DRIVEN FASTENERS

1. Introduction

Power-driven fasteners are used frequently aboard commercial vessels to attach nonstructural items such as cables, cable trays, electrical fixtures, and pipe hangers to stiffeners, beams, frames, and nontight structural bulkheads. They are, basically, small-arms projectiles with stud threads on one end. These projectiles are "shot" into steel members to provide mountings similar to welded studs. Since they pierce the steel members, they may lead to crack-initiation sites, areas of localized corrosion, or sources of leaks. The possibility of loosening the fastener also exists, since the bond between the fastener and the structure is mechanical, not cohesive. Power-driven fasteners must not be used in areas that are sensitive to stress patterns or corrosion. The only practical way to control their use is to grant specific approval for their use on a case-by-case basis. This is best done when construction plans for new vessels, or revised plans for existing vessels, are submitted for approval. When used, power-driven fasteners shall be attached at least 1 inch from the edge of any member.

2. Acceptable Uses (Subject To Approval)

a. Within Machinery Spaces.

(1) On main girder webs, other than primary longitudinals;

(2) On webs of watertight bulkhead primary stiffeners;

(3) On flanges and webs of beams on flats;

(4) On pillars; and

(5) On plating on flats.

b. Outside Machinery Spaces.

(1) On nontight bulkheads; and

(2) On decks other than weather decks.

3. Unacceptable Uses

a. In side shells;

b. In strength decks or primary stiffeners;

c. In tank tops;

d. In tight bulkheads (W.T., O.T., etc.);

e. In flanges of primary structural members;

f. In any weather location;

g. In webs of primary longitudinals;

h. In pipe hangers for systems where thermal stresses are significant and hanger placement is important (e.g., high temperature);

i. In any member in which failure would create a personnel hazard, such as a handrail or ladder;

j. On members less than 0.25 inches thick;

k. On members whose operating temperature is normally below 1C;

l. On materials other than mild steel;

m. As grounding devices; and

n. To fabricate composite beams.

CHAPTER 3: FACTORY AND SHOP INSPECTIONS OF EQUIPMENT AND MATERIALS

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CHAPTER 3: FACTORY AND SHOP INSPECTIONS OF EQUIPMENT AND MATERIALS

A. INTRODUCTION

This chapter contains guidance relative to factory and shop inspections of equipment and materials required to be used on merchant vessels. These instructions implement the requirements of 46 CFR 159. Most factory and shop inspections are now conducted by independent laboratories, so assignment of inspectors on a continuing basis is unnecessary. However, periodic visits to manufacturers by Coast Guard inspectors should be made. Manufacturers of approved equipment must grant access to inspectors as a condition of approval.

B. SERVICING OF LIFE RAFTS

1. Carpeting in Service Facilities

Life raft service facilities should be advised against the use of carpeting in their service areas. Carpeting absorbs moisture from the rafts, and is extremely difficult to dry out and disinfect. Fungi that attack rubber-coated fabric rafts may breed in carpeting and damage rafts that are serviced later. Also, carpeting can develop brass fitting contamination, known as "copper oxidation." Although neoprene-coated rafts are not affected by this oxidation, rubber-coated fabric rafts and their metal fittings will be contaminated and deteriorate rapidly. Also, carpeting can lodge small splinters and bits of metal that can puncture and damage rafts.

2. Facilities that Service Foreign Rafts

The Commandant has received numerous requests to inspect U.S. facilities that service foreign rafts. Such requests may be honored by the officer in charge, marine inspection (OCMI), provided that:

a. The facility operators agree to abide by the provisions of 46 CFR 160.051-6 (except for the stamping provisions of 160.051-6(e), which do not apply) and the Annex to the International Maritime Organization (IMO) Resolution A.333(IX). Upon such agreement, the facility's activities shall be spot-checked. Annual reviews shall be made of all such facilities within the OCMI's zone.

b. The facility shall obtain written authorization from raft manufacturers for servicing their products, and shall agree to have the items indicated in Paragraph 1(n) of the IMO Annex.

c. The facility shall maintain servicing records for review by the Coast Guard. It shall also provide to Commandant (G-MOC) an annual summary of deficiencies found on the rafts that were serviced. This survey will allow the Commandant to comply with the requirements of Paragraph 3 of the Annex.

3. Letters of Acceptance

At the completion of a satisfactory evaluation, the OCMI will issue a letter of acceptance to the servicing facility, and forward a copy to Commandant (G-MOC). The Commandant, in turn, will list the facility in Equipment Lists, Commandant Instruction (COMDTINST) M16714.3A, and notify the home Administrations of raft manufacturers that the particular facility has been accepted. Notices of withdrawals will follow the same procedure. The Annex to IMO (formerly IMCO) Resolution A.333(IX) is reprinted in Figure 17-1.

3. Liferaft Hydrostatic Release Testing

The need for the necessity for a Marine Inspector to attend every liferaft servicing has been eliminated. Accordingly, marine inspectors need only witness the testing, and stamp the inspection tag, of hydrostatic release units that are tested concurrently with a "spot check" liferaft servicing attended by an inspector. For testing of those hydrostatic release units not witnessed by a marine inspector, the facility performing the test will stamp its three-digit facility identification code in lieu of the MIO identification letters and "USCG" (46CFR160.62). Facility codes may be found on all recent liferaft servicing approval letters and in COMDTINST M16714.3E (Equipment Lists)

4. Life Raft Inflation Systems

Servicing of Approved Inflatable Liferafts

a. Approved inflatable life rafts must have their inflation systems tested for compliance with 46 CFR 160.051-5(c)(4) and (e)(11) (see NVIC 2-75). These regulations require inflation systems to meet time and temperature range limitations. The method presently used for compliance is pre-charging the carbon dioxide (CO2) inflation cylinder with nitrogen gas to an approximate 10-percent volume. The nitrogen is relatively unaffected by external temperature changes, and acts as a catalyst to release the CO2. Coast Guard approved service facilities must follow the manufacturer's service procedures to pre - charge cylinders. The use of nitrogen to meet this requirement is the industry's standard technique; other methods may be used upon Coast Guard acceptance.

Servicing of Non-Approved Liferafts

b. Servicing of Non-approved Rafts: Servicing of Non-approved Rafts. Uninspected vessels may be equipped with non-approved rafts or rafts that are not serviced at approved facilities. These rafts may not have received a temperature compensation pre-charge at the last servicing. This may result in under inflation or non-inflation when the raft is put into use.

C. PERSONAL FLOTATION DEVICES (PFD'S)

1. Introduction

Life preservers, buoyant vests, cushions, and other PFD's (Type I, II, III, IV, and V) are manufactured in accordance with:

PFD TYPE	CFR APPROVAL CITE
Type I	46 CFR 160.002, 160.005, 160.055
Type II	46 CFR 160.047, 160.052, 160.060
Type III	46 CFR 160.064
Type IV	46 CFR 160.048, 160.049, 160.050
Type V	46 CFR 160.053, 160.077

NOTE: There are some exceptions to type designations. These specifications place an explicit obligation on a manufacturer to inspect all PFD's. Such inspections are intended to maintain the high quality of such products.

2. Life Preservers and Ring Buoys

Type I Devices

a. As of 1 September 1983, the Coast Guard discontinued regular factory inspections of these devices. Regular inspections are conducted by independent testing laboratories such as Underwriters Laboratories, Inc. (UL) and Pittsburgh Testing, Inc. The laboratory inspectors who perform this task are responsible for ensuring that the device meets all applicable specifications and approved plans, and that the manufacturer is performing sufficient tests and has an adequate quality control program. It is the laboratory inspector's responsibility to carry out the procedures in Subchapter Q and the "Guide For Independent Organization Inspection of Type I and Type V PFD's Under Subparts 160.002 and 160.055." This guide was prepared by Commandant (G-MOC) and first issued on 5 August 1983. These procedures help ensure that a manufacturer's devices meet the applicable requirements before they are accepted and marked.

Type IV Devices

b. For Type IV ring buoys approved under 46 CFR 160.050, inspections are also performed by independent laboratories as of 1 September 1983. As with Type I PFD's, the laboratory inspector is responsible for conducting the procedures required by Subchapter Q and the "Guide For Independent Organization Inspection of Type IV PFD's Under Subpart 160.050," which was first issued on 8 August 1983.

Coast Guard Oversight

c. Unannounced Coast Guard inspections should be made at the place of manufacture to ensure that both the manufacturer's quality control and testing laboratory's inspection program are adequate. Such unannounced inspections must be conducted whenever a new approval is granted, and at least quarterly. Additional inspections should be conducted when problems have been discovered during the previous inspection or when the OCMI is notified of problems in the field. When discrepancies are found, immediate action shall be taken to correct them. A report should be submitted to Commandant (G-MOC) noting discrepancies found, corrective actions taken, and recommendations for further action, as appropriate. Communication between the OCMI and the local laboratory inspector(s) will help ensure compliance by the manufacturers.

FIGURE C3-1: IMCO RESOLUTION A.333(IX) ADOPTED ON 12 NOVEMBER 1975 ANNEX RECOMENDATION ON THE CONDITIONS FOR THE APPROVAL OF SERVICING STATIONS FOR INFLATABLE LIFERAFTS

1. Administrations should ensure that periodic survey of inflatable life rafts is performed at servicing stations that have demonstrated competence to service and re-pack rafts, maintain an adequate facility and use only properly trained personnel. Servicing stations, which should have demonstrated this capability for inflatable life rafts of each manufacturer whose rafts they service, should comply with the following:

(a) servicing of inflatable life rafts should be carried out in fully enclosed spaces only. There should be ample room for the number of inflatable life rafts expected to be serviced at any one time; the ceiling should be sufficiently high to overturn, when inflated, the largest life raft to be serviced;

(b) the floor surface should be provided with an easily cleaned coating, sufficiently smooth to ensure that no damage will occur to the life raft fabric;

(c) the servicing space should be well lit provided that direct rays of sunlight do not enter the space;

(d) the temperature and, when necessary, the relative humidity in the servicing space should be sufficiently controlled to ensure that servicing can be effectively carried out;

(e) the servicing space should be efficiently ventilated, but be free from draughts;

(f) separate areas or rooms should be provided for:

(i) life rafts awaiting servicing, repair or delivery;

(ii) the repair of glass fibre containers and painting CO2 cylinders;

(iii) materials or spare parts;

(iv) administrative purposes;

(g) means should be provided in the life raft storage space to ensure that life rafts in containers or valises are not stored in more than two tiers or subjected to excessive loads;

(h) spare and obsolete pyrotechnics should be stored in an approved, safe and secure magazine well away from the servicing and stowage spaces;

(i) sufficient tools should be available for the servicing of life rafts and release gear in accordance with the requirements of the manufacturer, including:

(i) manometers or pressure gauges and thermometers which can be easily read with sufficient accuracy;

(ii) dual purpose air pump(s) for inflating and deflating life rafts, together with the necessary high pressure hoses and adaptors;

(iii) a suitable pair of scales for weighing CO2 cylinders with sufficient accuracy;

(iv) sufficient gas for blowing through the inlet system of the life rafts;

Figure 17-1 — Continued

(j) procedures and arrangements should be made to ensure that a gas cylinder is properly filled and gas-tight before fitting to a life raft;

(k) sufficient materials and accessories should be available for repairing life rafts together with replacements of the emergency equipment;

(l) when servicing davit-launched life rafts adequate means should be provided for overload testing of such life rafts;

(m) servicing and repair work should only be carried out by qualified persons who have been adequately trained to the satisfaction of the Administration. The training procedure should ensure that servicing personnel are made aware of changes and new techniques;

(n) arrangements should be made with the manufacturer to make available:

(i) changes to servicing manuals, servicing bulletins and instructions;

(ii) proper materials and replacement parts;

(iii) bulletins or instructions from the Administration;

(o) smoking should not be allowed in the servicing and packing areas.

2. After initial approval Administrations should arrange for the frequent inspection of servicing stations to ensure that standards are maintained.

3. Each servicing station should prepare and transmit to the Administration, at regular intervals, statistics showing the nature and extent of damages to and defects found in life rafts during servicing and repair work.

Factory Inspections

d. Inspectors making factory visits shall ensure that the PFD's produced comply with the specifications for materials, construction, buoyancy, and workmanship. The independent inspection organization guides referenced above should be followed. In all cases, the inspector shall:

(1) Examine the manufacturer's records of production lot buoyancy tests.

(2) Examine all materials used in the construction. The manufacturer shall show compliance through material affidavits, certified test reports, or tests made in the presence of the inspector.

(3) Examine the component parts and finished items for compliance with applicable drawings, product description, etc.

(4) Examine the markings for proper wording, lot numbers, approval numbers, etc., and test of marking for waterproofness and legibility.

(5) Test the strength and slippage of a body strap assembly. The test must be run at the load specified in the appropriate subpart and must last for 10 minutes, in which time no more than 3 inches of slippage (1 inch for Type I devices) is permitted.

(6) Test the buoyancy of pad inserts. If kapok-filled pad inserts fail the buoyancy test, the buoyancy test for processed kapok under 46 CFR 164.003 shall also be made.

(7) Test the volume displacement of vinyl-covered pad inserts.

(8) Test the seam strength of heat sealed, vinyl-covered pad inserts.

(9) Check the manufacturer's test equipment for calibration within the previous 6 months.

(10) Compare test results with the records of manufacturer tests for correlation.

3. Work Vests

These devices are manufactured in accordance with the requirements of 46 CFR 160.053, which do not require regular factory inspections by the Coast Guard. The OCMI should, however, conduct unannounced inspections at least quarterly, as described above, for manufacturers of work vests in his or her zone.

4. Buoyant Vests, Cushions, and Marine Buoyant Devices

For Type II, III, and IV cushions and some special Type V's, factory inspections are conducted by a recognized laboratory such as UL. However, the specifications provide that unannounced Coast Guard inspections may be made at the place of manufacture at any time. Further, it is the Coast Guard's responsibility to ensure that the testing laboratory's inspection program is adequate. Through at least annual unannounced inspections, OCMI's shall ensure that adequate quality control exists at PFD manufacturers' facilities. When discrepancies are found, immediate action shall be taken to correct them. A report should be submitted to Commandant (G-MOC) noting the discrepancies found, corrective actions taken, and recommendations for further action, as appropriate.

D. IDENTIFICATION AND CERTIFICATION OF ENGINEERING MATERIALS

Under 46 CFR 50.25-1, certain products (e.g., plating, stay bolts, and valves) must be certified by the manufacturer. 46 CFR Table 50.25-1(a) outlines identification and certification requirements for engineering materials. As outlined in 46 CFR 50.15-5 and 50.15-15, certain American Society of Marine Engineers (ASME) and American Society for Testing Materials (ASTM) specifications are adopted for Coast Guard use. The Commandant does not intend to abandon the policy of promoting quality control. Those products listed in 46 CFR Table 50.25-1(a) should be stamped in accordance with the applicable specifications and accompanied by the manufacturer's certification. They may, however, be accepted without such certification, as indicated in 46 CFR 50.25-5. In all cases, the inspector must be satisfied that material presented by the fabricator or repair facility matches that identified in the mill or manufacturer's certificate.

E. BOILERS AND UNFIRED PRESSURE VESSELS

1. PV Markings

Certain ASME certified pressure vessels are accepted by the Coast Guard without Coast Guard shop inspection. However, stamping with the Coast Guard symbol in accordance with 46 C.F.R.50.10—25, 54.10—3, and 54.10-20 is required for all pressure vessels meeting 46 C.F.R. 54.01—5(c)(3) other than those excepted by 46 C.F.R. 54.01—5(c)(4) and 46 C.F.R. 54.01—15(a)(1),(2),(3)&(5). No Marine Safety Office identification letters or serial numbers are required for pressure vessels unless the Coast Guard conducts the shop inspections. The manufacturer's name and serial number provide sufficient identification for these units.

2. Data Reports

Since the Coast Guard requirements applicable to pressure vessels found in 46 C.F.R. Table 54.01—5(b) are in excess of the minimum requirements of the ASME Code, it must not be assumed that ASME authorized inspectors will assure that they have been met. Accordingly, to assure these additional requirements are met, marine inspectors must review the manufacturer's Data Reports. The Coast Guard symbol stamped on the pressure vessel indicates that a marine inspector reviewed the Data Reports and that the pressure vessel meets Coast Guard regulations.

3. Shop Inspections

Complete marking with the Coast Guard symbol and serial number is required for all pressure vessels receiving Coast Guard shop inspection whether or not an ASME stamp is applied. This marking will be applied by the marine inspector performing the shop inspection. When the Coast Guard conducts shop inspection of pressure vessels the marine inspector will also sign the Data Reports to indicate compliance with Coast Guard regulations.

> **NOTE:** See MSM II, Section A, Chapter 4 for further information on boiler plan submittal.

F. MARINE SANITATION DEVICES (MSD'S)

Pressure vessel components of these devices are generally exempt from shop inspection and plan approval requirements via 46 CFR 54.01-15(a)(1). Though not generally inspected as pressure vessels, these units are subject to the requirements of 33 CFR 159 (see chapter 18 of this volume).

G. OILY-WATER SEPARATORS

Oily-water separators are nonstandard fluid conditioner fittings. As such, they are not subject to the requirements for shop inspection and stamping of 46 CFR 56.15-1(e). Though not inspected as pressure vessels, such units are subject to the requirements of 46 CFR 162.050.

H. LIFE RAFT INFLATION SYSTEMS

1. Servicing of Approved Inflatable Liferafts

Approved inflatable life rafts must have their inflation systems tested for compliance with 46 CFR 160.051-5(c)(4) and (e)(11) (see NVIC 2-75). These regulations require inflation systems to meet time and temperature range limitations. The method presently used for compliance is precharging the carbon dioxide (CO2) inflation cylinder with nitrogen gas to an approximate 10-percent volume. The nitrogen is relatively unaffected by external temperature changes, and acts as a catalyst to release the CO2. Coast Guard approved service facilities must follow the manufacturer's service procedures to pre -charge cylinders. The use of nitrogen to meet this requirement is the industry's standard technique; other methods may be used upon Coast Guard acceptance.

2. Servicing of Non-Approved Liferafts

Servicing of Non-approved Rafts: Servicing of Non-approved Rafts. Uninspected vessels may be equipped with non-approved rafts or rafts that are not serviced at approved facilities. These rafts may not have received a temperature-compensation precharge at the last servicing. This may result in under inflation or non-inflation when the raft is put into use.

CHAPTER 4: MISCELLANEOUS VESSEL INSPECTION ACTIVITIES

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CHAPTER 4: MISCELLANEOUS VESSEL INSPECTION ACTIVITIES

A. GENERAL CONCERNS

Proper and reliable operation of a vessel's steering gear is vital to the safety of the ship, its personnel, and the marine environment. Coast Guard inspections of steering systems must be thoroughly and intelligently performed. Prior to any testing, the inspector should become familiar with the equipment and its operation. A review of the manufacturer's instruction manual may be necessary. The inspector should then carefully inspect and witness the testing of all equipment, controls, and alarms, remaining alert for signs of equipment failure, improper operation, defective equipment, or potentially hazardous conditions. The chief engineer and master should be interviewed concerning overall operation and reliability of the steering system. Attention should be given to steering operations and tests during review of the official logbook. A thorough knowledge of steering gear standards and their development is important to assess where to place inspection emphasis. For this reason, information on standards development, a list of references, and some vessel casualty and steering regulation history, are included in this section.

B. INSPECTION PROCEDURES

1. General

Prior to conducting operational tests of the steering system, it should be inspected as described below. The general objective is to closely examine all electrical, mechanical, and hydraulic connections and linkages of the main and auxiliary steering systems. The inspector should:

a. Sound the mounting bolts of all equipment.

b. Check all piping systems and attachments, equipment-securing brackets, protective guards, wire runs and cages, and other items prone to corrosion or vibration fatigue.

c. Inspect control linkages, linkage pins, and ram guides for wear.

d. Identify and closely examine feedback devices, differential units, or other components that may represent potential single-point failures (i.e., the weakest link). Refer to the steering system design philosophy and requirements in section 14.F below to help identify sections not required to be duplicated.

e. Ensure that all vital connections, pins, couplings, and control linkages have securing devices, such as cotter pins or double-nut locking arrangements, to prevent loosening from heavy vibration. Hydraulic transfer valves (such as a six-way valve) should lock in each position. Padlocks or other securing arrangements needing special keys or tools are not authorized.

f. Check emergency steering procedures and steering transfer diagrams for clarity and proper labeling of valves. Check that the steering procedures and steering transfer diagrams accurately reflect actual conditions in the steering gear room and wheelhouse, respectively (i.e., wheelhouse procedures should accurately reflect equipment/control actions required to change over to alternative or emergency steering).

g. Inspect carrier bearing (or equivalent) and rudder stock packing.

h. Inspect steering gear room for watertight integrity, cargo stowage, fire hazards, ventilation, missile hazards, or other hazardous conditions.

2. Electrical Equipment

With all power sources secured at the main and emergency distribution switchboards, the inspector should inspect all steering motor starters and switchgear in accordance with the appropriate provisions of 46 CFR 110.30 and 111. The inspector should be particularly alert for loose wiring connections, loose equipment mounting screws, frayed or broken control wiring (especially in way of door hinges), and dirt or debris. Mechanical operation of start/stop and transfer switches should be free and smooth. All switches and circuit breakers should be exercised. Electrical securing devices such as lugs, strain relief crimp connections, edge connectors, and terminal boards are prone to vibration and corrosion problems and should be closely examined. All connections, insulators, and switching devices should be secure and clean to prevent arcing or insulation breakdown. Excess spare fuses may indicate past problems with overloaded circuits.

3. Pumps and Motors

The inspector should hand rotate each motor and pump assembly, being alert for unusual noise, binding, or a feeling of roughness during rotation. Couplings should be examined for excessive play and evidence of grease slinging. Grease on the overhead near a coupling may be a sign of coupling wear or excessive lubrication. Check motor ventilation openings for cleanliness.

4. Hydraulics

All hydraulic hoses and connections must be carefully checked. The inspector shall check hydraulic oil for proper level, alarms, cleanliness, and signs of emulsion. On dual-power systems, interconnections or fittings that may fail and cause both systems to lose oil should be noted and particularly checked. The inspector should be alert for signs of oil leakage or cleanup just prior to inspection. Evidence of metal in strainers or filters may indicate imminent failure.

5. Control Linkages

Mechanical linkages between the rudder differential and pumps are not subjected to high loads, so strength is not a problem. However, repeated bi-directional movements, combined with vibration, can cause loosening of connections. All of these connections are generally in the open and readily visible for inspection. Because these linkages are critical to the operation of the steering system, inspectors should place considerable emphasis on control linkage examinations. The ship's crew also should inspect all connections on a routine basis.

6. Differential Control Units

The function of the differential unit is to compare the helm order with the rudder position and produce an output to control the hydraulic pump. Because of the vital nature of this system, which is composed of many moving parts and connections, emphasis should be placed on this unit during an inspection.

7. Relief Valves

Relief valves are used to limit hydraulic pressures under severe loading conditions, such as those encountered during heavy weather. Two basic types of relief valves are employed, a balanced piston or a check-valve (spring-loaded) type. The balanced piston is used for high pressures; check-valve types are used for applications such as filter bypasses, in which lower differential pressures are expected. These valves are not subjected to frequent cycling under normal service, and a common problem is freezing of the piston in the closed position. Preventive maintenance should include proper hydraulic filtration and periodic valve cycling. The manufacturer's data book should be consulted for recommended relief valve testing and setting.

8. Piping and Fittings

The inspector should examine hydraulic pipes and fittings for condition, proper support, and alignment. Fittings should be closely examined for leaks and evidence of overtightening. Socket welded fittings are generally preferred in areas of high vibration. High-pressure piping is generally made from Schedule 80 seamless carbon steel and should be adequately supported. Tubing applications should be limited to minor services where exposure to rough handling is not a problem. Hoses with abrasions, kinks, twists, or soft spots should be replaced.

9. Securing Devices

Securing devices that are most seriously affected by vibration are keys, set screws, and pins. Rollpins, grooved straight pins, or similar securing devices should be used in heavy vibration areas. Lockwire may be used in lighter duty areas.

a. Rollpins provide good resistance to loosening from vibration because the rollpin is pressed into place and exerts a spring force to keep it in. Rollpins are often used to attach a gear to a shaft when strength is not a problem.

b. Keys provide more strength than rollpins and are excellent for transmitting torque. Keys are held in place by friction and should not be relied on for maintaining axial position. Vibration can back keys out even when they have been tightly fitted.

c. Woodruff keys are not as satisfactory as straight pins although they offer more resistance to tipping. These keys require a tight fit to the hub, which makes them more prone to backing out than straight pins.

d. Set screws may be used as a type of key and retainer. This arrangement may not hold up well to reverse loadings. To secure set screws better, staking is often used for light loads. Staking must be done when the piece is assembled. Minor repairs to parts utilizing staked set screws may result in a missing or improper stake and subsequent failure of the securing device. Set screws are also used to better hold key arrangements.

e. Cotter pins provide a means of further retaining a bolt, pin, or other securing device. The pins must be properly bent (180) and secured to prevent failure or backing out.

f. Tapered pins of any kind are generally not accepted in steering systems.

g. Nuts are prone to backing off during vibration and should be used with additional retaining devices such as special lock washers, keys, pins, or double-nut arrangements.

C. OPERATIONAL TESTS

1. General Tests

The objective is to test thoroughly all steering systems, in all modes of operation from all control locations. This is best done with one inspector on the bridge and another in the steering gear room. The inspectors shall:

a. Verify that the system operates to design and regulation requirements;

b. Ensure that operating instructions are properly posted and accurate; (steering system controls and changeover procedures may be distinctive for the wheelhouse and steering gear room).

c. During operation of the steering apparatus, be alert for unusual noise, vibration, oil leakage, and abnormal hydraulic pressures. "Hunting" and erratic or jerky movements of the rudder, follow-up system, or synchro-repeater system may indicate control or feedback problems;

d. If underway, check for normal operation under load, with special attention to overheating of the operating motor and pump assembly; and

e. Test all alternate systems, alarms and indicators under simulated casualty conditions (such as tripping the main steering power breaker).

2. Pumps, Motors, and Controls

The inspectors shall:

a. Energize the equipment and test the operation of each motor and pump assembly, using both port and starboard control cables;

b. Operate each motor and pump assembly from the bridge, the alternative control station, and the steering gear room through the full range of rudder travel; and

c. Operate each motor and pump assembly on the normal, alternate, and emergency power supplies, checking for the proper operation of the manual feeder transfer switch and automatic bus transfers during this procedure.

3. Auxiliary Steering

Auxiliary steering arrangements should be thoroughly tested by simulating a main steering or power failure. Steering control and power should be readily switched to the auxiliary system.

4. Rudder Angle Indicators/ Feedback

The inspectors shall verify that the rudder angle repeaters on the bridge, alternative control station, and steering gear room are in alignment with each other and with the mechanical rudder angle indicator. Visibility from the steering station and night lights shall also be checked.

5. Alarms and Indicators

The inspectors shall verify that all required indicating lights, alarms, and emergency lighting in the pilothouse, machinery space, and in the steering gear room operate properly (See MSM II-C4.I below).

6. Comm-unications

The inspectors shall test for proper operation of all voice communication systems between the bridge, alternative control, and steering gear room.

7. Regulatory Compliance

Particular attention to detail is required during inspection of new installations, modifications, and major repairs to verify compliance with all steering gear standards and regulations (See MSM II-C4.F and G below). Some compliance tests, such as overloads or maximum design limits, may not be feasible or safe. Early communications between the officer in charge, marine inspection (OCMI), vessel owner, equipment manufacturer, and contractor, concerning testing requirements and alternatives are encouraged.

D. INSPECTION RECORDS

At the completion of a steering gear inspection, a detailed description of the tests and inspections performed should be included in the appropriate inspection book. If the inspection was split between hull and boiler inspectors, the hull book should summarize the entire inspection. The following are examples:

1. All Vessels, *Except* Small Passenger Vessels

"All accessible electrical, mechanical and hydraulic connections and linkages in the steering gear room were examined by the boiler inspector and found satisfactory. Tested the main and auxiliary steering systems and associated alarms in all modes of operation from all control locations. Checked rudder angle indicators. All inspections and tests sat. Interview of the chief engineer, master and review of the vessel's logbook indicate past reliable operation of all steering systems."

2. Small Passenger Vessels

"Steering system is a rod-to-gear and chain assembly. Examined the entire system while exercising the helm. All couplings, sprockets, and chains are aligned, well lubricated, and operate freely. Examined securing devices and connections; all satisfactory. Rudder post, packing and tiller examined and found sat. Operational tests of bridge and flying bridge steering stations sat. Emergency tiller readily accessible and tested sat."

E. CONSIDERATIONS FOR SPECIFIC STEERING SYSTEMS

1. Ram Systems

These generally consist of single or paired double-acting hydraulic rams, connected by a link or Rapson Slide mechanism to the tiller.

(a) Link systems use connecting rods or linkages from the ram to the rudder post. They are common in dual-rudder arrangements and installations with less space surrounding the rudder post.

(b) The Rapson Slide unit is a common ram arrangement consisting of a block or sleeve (trunnion block) pivoted on a ram that is guided by a cross-head (yoke) fitted to the rudder stock. An advantage of this arrangement is that as the rudder angle increases, the ram's mechanical advantage increases.

2. Rotary Vane Systems

A rotary vane-type steering gear consists of a vane actuator connected directly to the rudder stock. Power and control is similar to hydraulic ram systems, but this system operates at lower pressures and has fewer moving parts than a ram system. Radial vane systems have proven to be as reliable as ram systems. Single actuator systems may be considered equivalent to the required dual apparatus with many of the same provisions as hydraulic rams. Preventive maintenance and routine inspections of the hydraulic system and strainers are especially important to rotary vane systems. Historically, a serious failure was prevented when metallic slag was found in the hydraulic system strainers. In this incident, sheared vane bolts had scored the pump cylinder walls. Investigation revealed that the bolts had sheared due to stresses at a notch created by tapered bolt heads fitted into unchambered bolt sockets.

3. Orbitrol Systems

Orbitrol steering systems are a type of hydraulic helm unit that may be found on offshore supply vessels (OSV's) and small passenger vessels. This system has been accepted for cargo vessels of less than 500 GT, under certain conditions, if the vessel is capable of steering with its screws. Deck winch motors may also run off the Orbitrol system if specifically approved on vessels of less than 100 GT. When testing Orbitrol systems, all auxiliary hydraulic motors should be running simultaneously.

4. Systems Aboard Small Passenger Vessels

Problems with small passenger vessel steering systems are frequently caused by a lack of maintenance, corrosion, or the loss of fasteners due to wear and vibration. The inspector should inspect the entire steering system visually, from behind the operator's console to the rudder post. The system should be exercised during the inspection to ensure that all pulleys, sprockets, cables, guides, etc., are free, well lubricated, and properly aligned. All linkages, pins, and fasteners should have locking devices. Steering system components that are not easily accessible may present potential failure points and should be carefully evaluated. The removal of protective guards, coverings, or other interferences may be necessary to inspect the system completely.

5. Auxiliary Steering Systems

Auxiliary steering and communication systems should be tested as outlined on posted directions. The inspector should check all labels and markings for compliance with these instructions. A deck winch to block and tackle arrangement need not be physically exercised, but all required equipment should be inventoried and examined. Auxiliary hand tiller arrangements should be checked for easy access, fit, and capacity. Trick wheel arrangements are easily tested and should be fully exercised. Hand pumps should be tested in both directions (but need not be run through the entire rudder range).

6. Integrated Steering/ Propulsion Systems

Such systems maneuver a vessel solely by changes to propulsion settings and do not use a rudder. Two examples are cycloidal propellers (a Voith system) and the Z-drive/Z-peller. Such systems provide a full 360-degree propulsion thrust output, which is especially advantageous on dredges, ferries, and towboats. The same essential design philosophy and inspection criteria apply to these systems. The inspector should consult the manufacturer's data book and plan approval letters to become familiar with the system.

F. STEERING GEAR STANDARDS AND DESIGN PHILOSOPHY

1. Coast Guard Regulations

For vessels built after 1 June 1982, the Coast Guard's standards apply a philosophy of duplication and separation to steering gear design standards so that, in the event of a casualty, a backup unit or operating position is available. A summary of duplication requirements in 46 CFR, Subchapters F and J are listed below:

Steering Apparatus

a. A main and auxiliary steering gear is required. However, a more common arrangement on larger vessels uses a dual-power system that has been accepted as equivalent to the separate auxiliary steering gear.

Acceptable Substitutions

b. Dual-powered hydraulic systems are an acceptable substitute for the auxiliary steering gear requirement, provided each power unit meets the capacity of the main steering gear. A dual-power hydraulic steering system is comprised of:

- Two cylinders or actuator chambers.
- Two independent pumps with independent piping to the cylinders. Cross-connects may be provided, in which case valving shall be provided to allow any pump/cylinder combination.
- Separate power leads to the pump prime movers for the source of power. Separate feeder circuits are required for electrohydraulic steering gears.
- Each independent steering power unit has the required power to meet the rudder movement requirements of 46 CFR 58.25-10(a).
- An independent control system for each hydraulic power unit.
- Two reservoirs, each of sufficient capacity. Cascade overflow types are acceptable, provided each half has sufficient capacity.

Steering Station

c. Two stations are required for controlling the main steering gear: one in the pilothouse, the other on the after weather deck, unless duplicate controls are provided to the pilothouse. Generally, duplicate controls are provided and the alternative steering station is in the steering gear room.

Steering Gear Control Systems

(1) A steering control system is defined as all equipment by which helm orders are transmitted from the bridge to the steering gear power units. The 1 June 1982 revision of Subchapter I has expanded this definition to include transmitters, receivers, feedback devices, differential units, hydraulic control pumps and all associated motors, cables, shafting, and piping for steering gear control.

Separate and Independent Control Systems

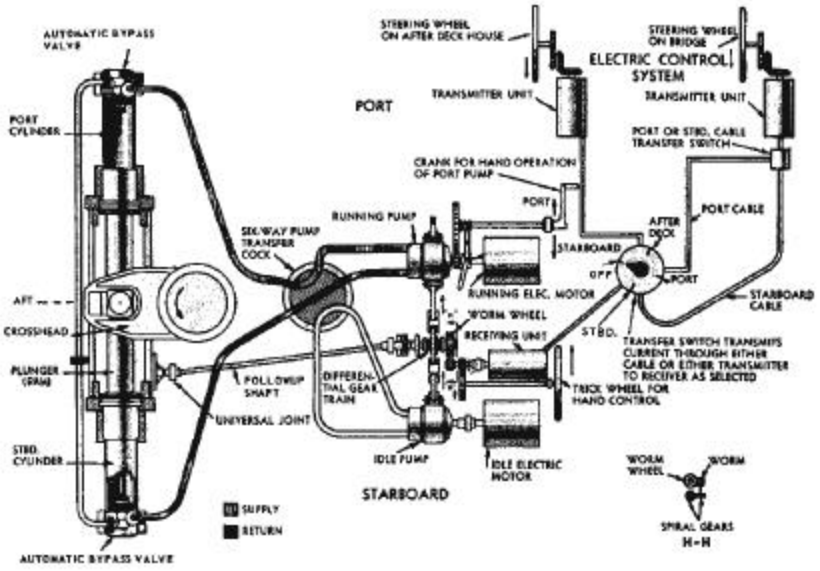
(2) Two separate and independent control systems are required: one in the pilothouse, the other at the alternative steering station. Control systems external to the steering gear compartment are required to be duplicated. For vessels constructed prior to 31 May 1982, some essential control system elements, such as feedback devices and differential control units, may not be duplicated.

Steering Gear Feeder Circuits

(3) One feeder circuit must be from the ship's service switchboard. The other circuit must generally be fed from the emergency or alternative power source. The circuits must be separated as widely as possible from one another.

2. International Standards

The international standards for steering gear are set forth in the International Convention for the Safety of Life at Sea (SOLAS). Historically, standards have been more specific and detailed for passenger ships than for cargo ships (including tankers). SOLAS 48 requirements (Chapter II, Part F, Regulation 56) only applied to passenger ships. SOLAS 60 (Chapter II, Regulation 29) had some requirements for cargo vessels but continued to concentrate on passenger ships. The 1978 Protocol to the 1974 Convention removed the distinction between passenger and cargo ships and placed additional steering gear requirements on tankers. The first amendments to SOLAS 74/78 have further improved steering standards for all vessels. However, the problems of common systems still exist and should be recognized during vessel inspections. (For further details on SOLAS requirements, See MSM II-C4.H.3 below.)



Single-ram electrohydraulic steering gear.

G. STANDARDS AND REFERENCES

1. 46 CFR, Subchapter F (Marine Engineering)

Marine engineering requirements have not appreciably changed since 1963, when the concept of a steering station located on the after weather deck was permitted to be replaced by an alternative steering station with duplicated pilothouse controls. These requirements are as follows:

	SYSTEM COMPONENT	CFR CITE
a.	Piping	46 CFR 56
b.	Steering gear requirements	46 CFR 58.25
c.	Special steering apparatus (such as cycloidal propellers)	46 CFR 58.25-65
d.	Steering gear periodic tests	46 CFR 61.20-1
e.	Fluid control testing	46 CFR 61.20-3

2. 46 CFR, Subchapter H (Passenger Vessels)

	SUBJECT	CFR CITE
a.	Steering gear installation details	46 CFR 77.03
b.	15 Steering gear examination, testing, and logging by ship's officers	46 CFR 78.17-15
c.	Instructions for changing steering gear	46 CFR 78.47-55

3. 46 CFR, Subchapter J (Electrical Engineering)

These regulations were substantially revised in 1982. The revision reflects many recommendations of the National Transportation Safety Board (NTSB), requirements of the Port and Tanker Safety Act (PTSA) and the first amendments to SOLAS 74:

	SYSTEM COMPONENT	CFR CITE
a.	Electric steering systems and controls	46 CFR 111.93
b.	Emergency lighting in steering gear room	46 CFR 112.15-1
c.	Emergency power source for steering	46 CFR 112.15-5
d.	Communication requirements for steering gear room	46 CFR 113.30
e.	Rudder angle indicator systems	46 CFR 113.40
f.	Steering failure alarm systems	46 CFR 113.43

4. 46 CFR, Subchapter T (Small Passenger Vessels (<100 GT))

Steering gear requirements for T-Boats (Small Passenger Vessels) may be found in the following cites:

	SUBJECT	CFR CITE
a.	Examination and testing of steering system by inspector	46 CFR 176.25-35
b.	Steering gear requirements	46 CFR 182.30

5. Steering Gear, Foreign Tankers

The regulation cited in 33 CFR 164.39 contains the requirements from the PTSA. Enacted on 17 October 1978, the PTSA specifically prescribed new steering gear requirements of the 1978 Protocol to SOLAS 74, for both new and existing tankers. The requirements of the PTSA, which became a Final Rule on 19 November 1979, are applicable to U.S. tankers and foreign tankers trading in U.S. ports. These regulations, essentially the same as those adopted by the International Conference on Tanker Safety and Pollution Prevention (TSPP), apply to tankers of more than 10,000 GT. New tank vessels were required to meet additional standards after 1 June 1980. Additional requirements became effective 29 October 1984.

6. Navigation and Vessel Inspection Circular (NVIC) 1-81

NVIC 1- 81, "Guidance for Enforcement of the Requirements of the Port and Tanker Safety Act of 1978," provides a comparison of existing and new steering gear regulations.

7. International Standards

SOLAS 60 and 74

a. The 1960 and 1974 SOLAS Convention reproduced the steering standards of SOLAS 60 verbatim because final agreement had not been reached on new standards, which were under consideration at the time.

International Conference on Tanker Safety and Pollution Prevention (TSPP)

b. International Conference on Tanker Safety and Pollution Prevention (TSPP). The TSPP, held in London during 6-17 February 1978, among other important actions, recommended improved steering gear standards for tankers. These were adopted in the 1978 Protocol to SOLAS 74.

SOLAS 74/78 & Amendments

c. The 1978 Protocol to SOLAS 74 was ratified on 1 November 1980 and entered into force on 1 May 1981. Steering gear standards for tankers of more than 10,000 GT became effective for new vessels when the Protocol entered into force, and allowed an additional two years for existing tank vessels to comply. Together with SOLAS 74, these standards that are referred to as SOLAS 74/78, have been amended with an effective date of 1 September 1984.

	SUBJECT	SOLAS CITE
a.	Steering gear standards	Chapter II-1, Regulation 29
b.	Additional requirements for electric and electrohydraulic steering gears	Chapter II-1, Regulation 30
c.	Steering gear operation requirements	Chapter V, Regulation 19-1
d.	Steering gear testing requirements	Chapter V, Regulation 19-2

H. REQUIRED LOGS AND TESTS FOR ALL VESSELS

1. Steering Gear Testing and Drills

Within 12 hours of departure, or within 48 hours prior to entering U.S. waters, the ship's steering gear shall be checked and tested by the crew. The test procedure shall include, where applicable, operation of the following:

- The main steering gear;
- The auxiliary steering gear;
- The remote steering gear control system;
- The steering positions located on the navigating bridge;
- The emergency power supply;
- All rudder angle indicators in relation to the actual position of the rudder;
- All steering gear control system power failure alarms (*46 CFR 113.43)*; and
- The steering gear power failure alarms (*46 CFR 113.43)*.

INSPECTION NOTE: <u>These checks and tests shall include:</u> (1) the full movement of the rudder according to the required capabilities of the steering gear; (2) a visual inspection of the steering gear and its connecting linkage; (3) and operation of the means of communication between the navigating bridge and the steering gear compartment.

2. Emergency Steering Drills

Emergency steering drills shall take place at least once every 3 months to practice emergency steering procedures. These drills shall include testing of direct control from the steering gear room, communications, and operation of any alternate power supplies. All officers concerned with the operation or maintenance of steering gear shall be familiar with the operation of the steering systems fitted on the ship, and with the procedures for changing from one system to another (see SOLAS 74/78).

3. Logging of Steering Gear Tests

All tests and inspections shall be recorded in the Official Logbook (See 33 CFR 164 and SOLAS 74/78, Chapter V, Regulation 19-2).

I. SUMMARY OF REQUIREMENTS FOR STEERING GEAR ALARMS AND INDICATORS

Alarm/Indicator	Alarm Type	Required By *
Rudder angle indicator	Visual	F, J, 164, SOLAS, AMEND
Motor pilot (running) light	Visual	J, SOLAS, AMEND
Feeder circuit breaker open	Audible	J*
Feeder circuit fuse open	Audible	J*
Motor overload	Audible & Visual	Rev. J, AMEND
Electrical power failure to steering gear control system	Audible & Visual	Rev. J, 164, Protocol, AMEND
Power failure to steering gear power unit	Audible & Visual	Rev. J, 164, Protocol, AMEND
Low hydraulic oil level	Audible & Visual	Rev. J, AMEND
Phase failure (3-phase power supply)	Audible & Visual	Rev. J, AMEND
Steering failure alarm	Audible &Visual	Rev. J

KEY:

F = 46 CFR Subchapter F
J = 46 CFR Subchapter J
Rev. J = Revisions to Subchapter J, effective 1 JUN 1982
J* = For existing vessels (i.e., contracted for prior to 1 MAY 1978), an electrical power failure alarm may be accepted as an alternate.
164 = 33 CFR 164.39 (tankers over 10,000 GT) (contains essentially the same requirements as the 1978 Protocol)
SOLAS = SOLAS 74 (same as SOLAS 60), effective 25 MAY 1980
Protocol = SOLAS Protocol (tankers only) effective 1 MAY 1981 for new tankers over 10,000 GT, and 1 MAY 1983 for existing tankers over 10,000 GT
AMEND = Amendment to SOLAS 74/78, effective 1 SEP 1984

FIGURE C4-1: Major Events Contributing to Improved Steering Gear Standards.

Date	Event
1963	46 CFR, Subchapter F is revised.
OCT 1971	Seventh Intergovernmental Maritime Consultative Organization (IMCO) Conference. 2 JUN 73 S/S SEAWITCH loses steering control due to the loss of a keeper pin in a shaft coupling to the differential echanism and collides with the S/S ESSO BRUSSELS: 16 fatalities, $23 million in damage.
6 MAY 76	CG proposes rule to require manning of steering gear room in certain waters; proposal withdrawn on 31 JAN 77 in favor of redundant system controls.
1976-1977	"Winter of the Tankers" (ARGO MERCHANT, SANSINENA, ELSA ESSBERGER). A series of disasters involving U.S. and foreign tank vessels prompts President Carter to propose tanker safety and pollution prevention initiatives, including emergency steering requirements.
24 FEB 77	S/S MARINE FLORIDIAN rams Benjamin Harrison Bridge in Virginia when steering power is lost due to a manual transfer switch jarring open.
NOV 1977	Ninth IMCO Assembly recommends improved steering gear standards.
28 JUL 77	M/V SITALA collides with moored barges near New Orleans due to loss of steering hydraulic fluid caused by leaking fittings in a single reservoir system.
6 FEB 78	IMCO sponsors International Conference on Tanker Safety and Pollution (TSPP), which accepts improved steering gear standards for SOLAS 74.
16 MAR 78	Very large crude carrier (VLCC) AMOCO CADIZ grounds off Portsall, France, following severe damage to the steering gear, after the loss of hydraulic fluid from a flange failure allows the rudder to swing free in heavy seas: millions of dollars in environmental damages, cleanup costs exceed $2 billion.
17 OCT 78	Enactment of the Port And Tanker Safety Act (PTSA).
30 AUG 79	M/V INCA CAPAC YUPANQUI collides with a moored butane barge after 0.8 ampere fuse opens on the vessel's only steering control system: 12 dead, $10.5 million in damage.
25 MAY 80	1974 SOLAS Convention enters into force.
1 MAY 81	The 1978 Protocol to SOLAS 74 comes in force.
8 APR 82	CG revises 46 CFR, Subchapter J, Electrical Engineering Regulations, and incorporates improved steering standards.
22 MAY 82	IMCO becomes the International Maritime Organization (IMO).
1 JUN 82	Effective date of revised Subchapter J for vessels contracted for after 1 MAY 1978.
1 OCT 84	First set of amendments to SOLAS 74 effective this date.
29 OCT 84	Final rule for 33 CFR 164, which incorporates provisions of 1978 TSPP Conference (Regulations 19-1 and 19-2 of SOLAS).

CHAPTER 5: INSPECTION OF INERT GAS SYSTEMS

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CHAPTER 5: INSPECTION OF INERT GAS SYSTEMS

A. INTRODUCTION

1. Background

Fire and explosion are among the greatest threats to the mariner; a tankship carrying crude oil, refined petroleum, or chemicals is an even greater threat. Fortunately, a properly designed, installed, operating, and maintained inert gas system (IGS) will completely prevent fire and explosion in an intact ship tank. Combustion is impossible without oxygen; if there is some way to keep the oxygen below about 8 percent, the ship will be free of danger from explosions in intact tanks. Typically, this is done by adding to the tank atmosphere a gas that has less oxygen (often 5 percent or less) than air, which has an oxygen concentration of 21 percent. Of course, when a tank is opened, as in a collision, oxygen can enter the tank regardless of the IGS. In the 1920's and 1930's, one American petroleum company suffered several tankship fires and decided to inert the cargo tanks of its ships. Reportedly, its vessels have not had any intact cargo tank fires since that time. Since the late 1970's, inerting has been required for most U.S. and foreign tankships. As of 1 June 1983, inert gas (IG) systems are required aboard all U.S. crude oil carriers over 20,000 deadweight tons (DWT) and all U.S. product carriers over 40,000 DWT. While in U.S. waters, foreign tankships of the same size must have IG systems in operation. For the purpose of the IGS regulations, integrated tug-barge (ITB) combinations that operate only in a combined mode are subject to the tankship rules for IG systems.

> **NOTE:** In addition, for chemical tankers and gas carriers the applicability of alternate inerting requirements as allowed by SOLAS Regulation II-2/55.5 were adopted in 1985 through the International Maritime Organization (IMO) Assembly Resolution.

2. References

There are several good references in addition to 46 CFR 32.53 and Regulation 62 of SOLAS 1974/78. Commandant's International Technical Series (CITS) Volume VII (USCG CITS-80-1-1), "Regulations and Guidelines for Inert Gas Systems," contains the SOLAS requirements, the IMO Guidelines For Inert Gas Systems, and the National Academy of Sciences National Materials Advisory Board Study on Material Aspects of Inert Gas Systems.

3. Federal Initiatives

In the mid-1970's, a series of tankship accidents led to the International Conference on Tanker Safety and Pollution Prevention (TSPP) of 1978 and the passage of the Port and Tanker Safety Act of 1978 (PTSA). A major result of these initiatives is that most U.S. and foreign tank vessels are required to have IG systems in operation while they are in U.S. waters. The Coast Guard's IGS regulations are contained in 46 CFR 32.53 (Inert Gas Systems); international rules are contained in Chapter II-2, Regulation 62 (Inert Gas Systems) of the International Convention for the Safety of Life at Sea (SOLAS), 1974. The first set of amendments to SOLAS 74 were adopted and came into force on 1 September 1984; under them, a ship must satisfy applicable requirements to receive a SOLAS Safety Certificate. The second set of amendments to SOLAS 74 come into effect on 1 July 1986; they have only a minor effect on the IGS requirements. The Coast Guard is developing changes to 46 CFR 32.53 to bring U.S. requirements into line with both sets of amendments to SOLAS.

B. SYSTEM CONCEPTS

1. Reasons for Inerting Systems

The "fire triangle" provides the basis to consider fire prevention techniques on tankships. It would not be practical to remove the fuel, which in this regard is the vapor generated by the cargo. Unless the cargo is Grade E and carried at a temperature at least 5C below its flash point (in which case there are no inert gas requirements), the cargo is volatile enough to produce a flammable vapor-air mixture above the fuel. After the cargo is offloaded, unless the tank is gas-freed and cleaned of all residue and clingage on its surfaces, a flammable atmosphere can be expected. If all ignition sources could be eliminated, so would all chances for a fire. However, conditions such as lightning and electrostatic fields generated during tank washing and heavy seas in partially ballasted tanks will always be present as ignition sources. Hence, there is really no practical alternative to inerting cargo tanks.

2. Means of Inerting Cargo Tanks

Introduction

a. Introduction. There are several ways to inert a tank. The simplest would be to add a pure nonflammable gas, such as nitrogen or carbon dioxide, to the tank atmosphere. Unfortunately, these pure gases tend to be expensive, the costs of their storage aboard ship tend to be high, and re-supply in some ports is difficult. Thus, most "inerted" ships use the gases from a fuel burner, from the ship's propulsion equipment (flue gas), or from a unit dedicated to producing inerting gas (an inert gas generator (IGG)). The following general description of an IGS includes components that may vary, depending upon the manufacturer.

Use of Combustion Gases

b. Use of Combustion Gases. Use of combustion gases as the inerting medium proves advantageous due to its availability as needed and much lower cost, if sufficient fuel and properly adjusted and operated equipment is provided. Its disadvantage is that the raw combustion gases are impure and must be treated before use in the cargo tanks. This is especially important for product carriers, in which cargo purity is critical and some cargoes may react with impurities in the inert gases. Each IGS has several components intended to remove these impurities. For example, sulfur in the fuel appears in the inert gas in the form of sulfur oxides, sulfurous acid, and sulfuric acid. If not removed, they will attack the metal of the tank and gradually destroy it. Passing the inert gas through a water-filled device called a scrubber removes most of these acids (see paragraph MSM II-C5.C.2 below).

Gas Distribution

c. Gas Distribution. When the inert gas is clean, cool, and water-free, it is pressurized and sent to the various cargo tanks. The distribution system contains backflow prevention devices, control valves, alarms, and automatic shutdowns. These alert personnel to a malfunction and, when necessary, shut down the system before a dangerous condition is developed in the tanks. Such conditions involve the oxygen concentration, the temperature and pressure of the inert gas, the water flow to and water level within the scrubber, and the backflow prevention devices (water seals). Because IG systems are complex and subject to malfunction, it is important for ships' crews to inspect and maintain them in good working order. The Coast Guard's inspections verify that they are properly maintained and operable.

3. Operation of the System

Introduction

a. Introduction. The purpose of an IG system is to keep the oxygen content of the vapor space below the level needed for combustion. For crude carriers, the oxygen content of the inert gas delivered to the cargo tanks should be no more than 5 percent, to ensure that there is not enough oxygen in the tank to support combustion.

NOTE: This figure may be lower for certain chemicals carried in product carriers.

Operation

b. Operation. 46 CFR 32.53 identifies which product/crude oil tankships must be equipped with an IGS. (See MSM II-C5.B.4 for discussion of "Inerting Requirements for Chemical Tankers and Gas Carriers.") For inerting purposes, oil cargoes are those cargoes identified as pollution category I in 46 CFR Table 30.25-1. Note: These cargoes may be different from what is considered to be oil for the application of Oil Pollution Act of 1990 requirements.) Questions have arisen concerning when an installed IGS must be operated, especially when a tanker is carrying a cargo that is not otherwise required to be inerted. While the requirements are clear, questions have arisen concerning when an installed IGS must be operated, especially when a tanker is carrying a cargo that is not otherwise required to be inerted. Normally, confusion arises concerning existing crude/product carriers between 20-40,000 DWT and vessels carrying only Grade E liquid cargoes. Generally, vessels required to have an installed IGS must maintain an inert atmosphere in the tanks whenever they are not gas free. However, when an IGS equipped tanker is carrying a cargo that is not required to be inerted and the tank, piping and venting conditions are functionally equivalent to a non-IGS tanker, the system may be secured at the operator's option. Table 15-1 summarizes the tanker categories that are required to have an installed IGS and the conditions whereby the

system may be secured. On tankers that are required to maintain an inert tank atmosphere,

it is not necessary for the IGS to be operated continuously. Once a tank is inerted and the tank openings closed and sealed, inert gas will leak out of the tank at such a small rate that the IGS may need to be operated only intermittently to maintain the inert tank atmosphere.

Requirements During Transfer and Tank Cleaning Operations

c. Requirements During Transfer and Tank Cleaning Operations. Offloading cargo is one of the few conditions under which the IGS must be in continuous operation. As the cargo is pumped out, inert gas must be introduced at an equal or greater volume rate, with excess inert gas flow vented to the atmosphere; if this is not done, air will enter the tank. Loading usually requires no additional inert gas if the tank is already inerted; the incoming cargo will displace the inert gas in the tank, which is then vented. Similarly, tank cleaning with fixed washing machines should not let inert gas escape. Cleaning with portable machines, if done with proper temporary seals around the machines, should release only a small amount of inert gas (requiring the IGS to operate for a short period to replace the gas that escapes). To gas-free an empty, clean tank, the IGS can be used to purge the tank free of hazardous vapors. Before loading a flammable cargo into a gas-free tank, the tank should be filled with an inert gas.

4. Inerting Requirements for Chemical Tankers and Gas Carriers

In considering the application of IGS requirements to chemical tankers, it was argued that this type of tanker should be given special consideration. This is primarily because both the inert gas from shipboard IGS and impurities in the inert gas can contaminate chemical cargoes. For example, the carbon dioxide produced as an inerting agent can drive certain cargoes off specification. Additionally, there are other chemical cargoes that are shipped with inhibitors that react with the oxygen in the tank to prevent the cargo from undergoing unwanted reactions. Therefore, the displacement of oxygen through inerting by any means (bottled nitrogen, inert gas generator, flue gas systems, etc.) can cause breakdown of inhibitors used to prevent these reactions.

Since the implementation of the 1993 Amendments to SOLAS '74, Regulation II-2/55.5 has allowed for substitute inerting requirements to be applied to chemical tankers and gas carriers in lieu of the requirements in Regulation II-2/60. These substitute requirements are contained in Res. A.473(XII), adopted on 19 November 1981. They apply to chemical tankers and gas carriers carrying petroleum products only.

The inert gas applicability requirements set out in Regulation II-2/55.5 are further modified by Res. A.566(14). In addition to the substitute requirements of Res. A.473(XII), Res. A.567(14). Adopter on 20 November 1985. This extends the applicability of substitute inerting requirements to the carriage of all flammable cargoes on board chemical tankers and gas carriers. Res. A.566(14) also prescribes the conditions under which no inerting is required.

Implementation

a. Implementation. Res. A. 566(14) applies only to chemical tankers and gas carriers, which would otherwise be subject to the IGS requirements of 46 CFR, 32.53 and SOLAS Regulation II-2/60 for tankers carrying crude oil and petroleum products. These include all "new" chemical tankers and gas carriers of 20,000 deadweight tons or more, as well as, those "existing" vessels of 40,000 deadweight tons or more, but less than 40,000 deadweight tons if fitted with tank washing machines having an individual throughput of greater than 60 cubic meters per hour. The dates distinguishing "new" from "existing" for the purpose of applying IGS requirements are contained in 46 USC 3701 and the 1978 protocol to SOLAS '74. For easy reference, those dates are included in this circular as Note 2 of enclosure (1).

Verify Vessel Type (e.g., Gas, Chemical Petroleum, Crude)

b. After establishing that the IGS requirements for tankers carrying crude oil and petroleum products would otherwise apply, it must be confirmed that the ship in question is a chemical tanker or gas carrier. As evidence a vessel meets the applicable definition, it must be in possession of a valid Certificate of Inspection (COI) (U.S. flag) or IMO Certificate of Fitness (foreign flag) endorsed for the carriage of at least one cargo appearing in the Tables/Chapters specified in the definition. For example, a U.S. flag tanker in possession of a valid COI, endorsed for the carriage of any cargo listed in Table 1 of 46 CFR 153, is considered to be a chemical tanker.

Identification of Cargo IG Need

c. Next, each flammable cargo to be carried must be considered individually to determine the inerting requirements applicable to the tank in which the cargo is being carried. The flammable cargoes should be divided into the following three categories:

- Crude oil;
- Petroleum products; and
- "Other than crude oil or petroleum products."

NOTE: Flammable cargoes "other than crude oil or petroleum products" are those listed in Table 1 of 46 CFR 153, Chapters VI or VII of the BCH Code, or Chapters 17 or 18 of the IBC Code. The cargoes listed in Table 1 of 46 CFR 153 closely parallel those listed in Chapter VI of the BCH Code and Chapter 17 of the IBC Code. There is no listing in U.S. regulations parallel to Chapter VII and 18 are identical); however, many of those cargoes are listed in 46 CFR 30.25-1.

d. For chemical tankers and gas carriers carrying flammable cargoes "other than crude oil or petroleum products, " there are no inerting requirements provided the vessel was constructed before 1 July 1986. If the vessel was constructed on or after 1 July 1986, no inerting is required provided the following conditions are met:

- The individual tank(s) involved do not have a capacity exceeding 3000 m3;
- The individual nozzle capacities of the tank washing machines do not exceed 17.5 m3/hr; and
- The total throughput for all the machines in use in a tank does not exceed 110 m3/hr.

For all chemical tankers carrying flammable crude oil or petroleum products, the IGS requirements of Res. A. 567(14) apply. If a chemical tanker was constructed before 1 July 1986, the IGS requirements of Res. A.473(XII) may be substituted for those in Res. A.567(14). The same requirements as included in this paragraph for chemical tankers or an equivalent should be applied to gas carriers when carrying flammable crude oil or petroleum products.

There may be instances when a flammable cargo which is not crude oil or a petroleum product also is not listed in 46 CFR 153, the BCH Code, or the IBC Code. This is most likely to occur when a new chemical is marketed and first transported. In situations such as this or any other time there is uncertainty regarding the inerting requirements for a particular cargo carried on board a chemical tanker or gas carrier, Commandant (G-MOC, 202-267-1464) should be consulted.

TABLE C5-1: INSTALLATION & OPERATION REQUIREMENTS FOR INERT GAS SYSTEM (IGS)[1,2]

VESSEL TYPE	INSTALLATION REQUIRED?	OPERATION REQUIRED?
Crude Oil Tankships		
Existing ships[3,4] All cargo grades	Yes for ships 20,000 DWT & over	Yes for ships 20,000 DWT & over
New ships All cargo grades	Yes for ships	Yes for ships
Product Tankships		
Existing ships[3] Grades A-D	Yes for ships 40,000 DWT & over	Yes for ships
40,000 DWT & over Grade E5 Design limited	No	No
Operationally limited: No volatile residues from previous voyages[6,7,9]	Yes for ships 40,000 DWT & over	No
Volatile residues from previous voyages	Yes for ships 40,000 DWT & over	Yes for ships 40,000 DWT & over
Any grade with high capacity washing machines (exceeding 60 cubic meters/hour)	Yes for ships 20,000 DWT & over	Yes for ships 20,000 DWT & over
New ships		
Grades A-D	Yes for ships 20,000 DWT & over	Yes for ships 20,000 DWT & over
Grade E5		
Design limited	No	No
Operationally limited:		
No volatile residues from previous voyages[6,7,9]	Yes for ships 20,000 DWT & over	No
Volatile residues from previous voyages	Yes for ships 20,000 DWT & over	Yes for ships 20,000 DWT & over
Crude Oil/Product Tankships[8]: Existing ships[3,4]		
Grades A-E crude oil	Yes for ships 20,000 DWT & over	Yes for ships 20,000 DWT & over
Grades A-D product[6,7]	Yes for ships 20,000 DWT & over	Yes for ships 40,000 DWT & over
Grade E5 product		
Design limited	No	No
Operationally limited:		
No volatile residues from previous voyages[6,7,9]	Yes for ships 20,000 DWT & over	No
Volatile residues from previous voyages	Yes for ships 20,000 DWT & over	Yes for ships 40,000 DWT & over
Any grade with high capacity washing machines (exceeding 60 cubic meters/hour)	Yes for ships 20,000 DWT & over	Yes for ships 20,000 DWT & over

TABLE C5-1: INSTALLATION AND OPERATION REQUIREMENTS FOR INERT GAST SYSTEM (IGS)[1,2] — CONTINUED

VESSEL TYPE	INSTALLATION REQUIRED?	OPERATION REQUIRED?
Crude Oil/Product Tankships[8]: New ships		
Grades A-E crude oil	Yes for ships 20,000 DWT & over	Yes for ships 20,000 DWT & over
Grades A-D product	Yes for ships 20,000 DWT & over	Yes for ships 20,000 DWT & over
Grade E5 product		
Design limited	N/A	N/A
Operationally limited:		
No volatile residues from previous voyages[6,7,9]	Yes for ships 20,000 DWT & over	No
Volatile residues from previous voyages	Yes for ships 20,000 DWT & over	Yes for ships 20,000 DWT & over

NOTES:

1. This Table is based on the requirements of 46 CFR 32.53.
2. The requirements for U.S. flag ships (operating worldwide) and foreign flag ships (operating in U.S. ports) are the same except as noted in footnote 8.
3. "New" and "Existing" tankers are defined in 46 U.S.C. 3701 (Contract date after June 1, 1979; in the absence of a contract date, keel laying date after January 1, 1980; delivery after June 1, 1982.).
4. The U.S. and SOLAS regulations provide for inert gas exemptions for existing crude and crude/product carriers in the range 20,000 to 40,000 DWT. However, the U.S. has not granted any exemptions to date for either U.S. or foreign flag tankships, and U.S. does not recognize inert gas exemptions granted by foreign Administrations.
5. This entry applies to a Grade E cargo that is carried at a temperature lower than 5 degrees C below its closed cup flashpoint. If it is heated to within 5 degrees C of its closed cup flashpoint, it is treated as if it were a Grade A - D cargo for the purposes of the IGS system. Differentiation is made between tankers that are limited to carriage of grade E cargoes by design and those that are capable of carrying more volatile cargoes but are only engaged in Grade E trade (i.e., operationally limited). The intent is to ensure that tankers that are operationally limited to Grade E cargoes are functionally equivalent to tankers that are limited by design to Grade E. See Notes 6,7 & 9.
6. Note that where an inert gas system is installed but not operated, the inert gas main stop valve must be closed and the inert gas blowers and inert gas generator, if any, secured.
7. In some venting system designs, when the IGS is not operating, the inert gas main can serve as a path for fire and explosion to travel from one tank to another. Therefore if the tank venting system incorporates the inert gas main and the tanks cannot be isolated from the inert gas main without risking over or under pressurizing the tanks, the inert gas system must operate at all times.
8. Foreign flag crude/product tankships from 20,000 to 40,000 DWT that have received inert gas exemptions from their Administration and that do not have inert gas systems installed may not carry crude oil in U.S. ports. However, they may carry product in U.S. ports.
9. A tank is considered to be free of volatile residues from previous cargoes when it has been cleaned and gas freed (safe for hot work) prior to loading the Grade E cargo. If the vessel shifts from the carriage of Grade D or higher cargoes to the carriage of Grade E cargoes without gas freeing, the first Grade E cargo must be treated as though it contained volatile residues. Subsequent Grade E cargoes need not be inerted provided the requirements of footnote 5 are met.

4. Problems of Reactive Products

Potentially, there is one significant problem introduced by the IGS systems: creation of pyrophoric iron sulfide. This solid chemical is formed at a very slow rate (building up over a period of months or years) by the reaction of the iron in the cargo tank surface with the sulfur compounds in the cargo. Iron sulfides react spontaneously and very rapidly with oxygen in the air, giving off heat. In an uninerted tank, this is not a problem. Each time that the tank is emptied (usually every few weeks), the iron sulfides react with the oxygen before much of a deposit has formed; thus, there is no opportunity for a buildup. If the tank is inerted, however, the tank surfaces may not be exposed to air for as long as 2 or more years and the iron sulfide may build up. When suddenly exposed to air, it will react, give off heat, and ignite any flammable vapors present. Although the International Maritime Organization (IMO) is examining this problem, no definitive solution has been found. A tankship should not be offloaded with an inoperative IGS because the process results in large amounts of oxygen entering the tank. In such cases, an external source of inerting gas should be used as a substitute for the inoperative system.

5. Basic Inspection Consider-ations

IG systems are complex, and the marine inspector should invest the time to learn what an IGS is, how it is designed, and how it can fail. Adding to this complexity is the fact that there are numerous IGS designs in use today. These involve different methods of producing inert gases, various ways to clean the gases themselves, and a vast number of combinations of types and arrangements of valves and piping. The inert gas is either treated flue gas from the ship's boilers or combustion gases from a separate, dedicated IGG. The major difference between flue gases and products of an IGG is that the sulfur oxide, sulfurous acid, and sulfuric acid concentrations are considerably lower when a low sulfur fuel is burned in the IGG. Otherwise, the principles of unable to support combustion operation, components, and general design are similar. Prior to inspecting an installed IGS, the inspector must become familiar with the particular system he or she will inspect, including a review of the manufacturer's instruction manual and the ship's operation and maintenance manual. The latter must provide specific outline plans, instructions, and safety precautions for the particular vessel.

> **SAFETY NOTE:** Above all, the inspector must be careful: if an IGS has made a tank atmosphere, it will not support life, either. A person who enters an inerted space without adequate breathing apparatus will die within a few minutes.

C. TYPICAL SYSTEM COMPONENTS FROM THE GAS SOURCE TO THE TANK

1. Boiler Uptake Valves (Flue Gas Isolating Valves, IGG Isolating Valves)

These valves are located near the main boiler uptake to isolate the IGS scrubber from the boiler uptake. Alternatively, if a dedicated IGG is used, this valve will be located near the IGG; it is closed when the IGS system is not operating. Associated with each boiler uptake valve is a steam soot-blowing system. A spectacle blank is also fitted between the boiler uptake valve and the IGS scrubber to ensure complete isolation of the IGS plant and cargo. This is very important to ensure that inert gas is not introduced into the system during maintenance.

2. IGS Scrubber (Scrubber Tower, Absorption Tower, and Gas Washer)

The raw inert gases are hot and contain soot, sulfur oxides, sulfurous acid, and sulfuric acid; all of these can be harmful to the cargo and the cargo tanks. The scrubber cools the gases and removes the contaminants by bubbling the gases through large quantities of seawater (there must be two sources of water for the scrubber). The gases are then sprayed with additional quantities of water, or rise through a packed bed of ceramic forms, plastic shapes, or metal trays through which seawater falls, increasing the efficiency of the water in cleaning the inert gas. The warm, acidic, dirty seawater is then piped overboard. If the scrubber is provided with a heater to prevent the water from freezing, an automatic control system is installed to prevent its overheating. The scrubber also acts as an automatic safety device by preventing a backflow of gas to the boiler uptake or the IGG (see Figure C5-1).

3. Demister Units

The gas from the scrubber has significant amounts of moisture, both from the burning process and from bubbling through the seawater in the scrubber. The demister is located close to the scrubber to remove entrained water from the IGS gas stream. If this water is not removed, it increases the corrosion rate in the system's piping, valves, and cargo tanks. Water may also contaminate the cargo. The demister may consist of "pads" or "mattresses" of woven polypropylene or fiberglass, or centrifuge separation (cyclone dryers). There are many designs, which vary considerably.

4. IGS Blowers (Fan Units)

Two or more independent blowers are located near the demister to draw the inert gas through the scrubber and the demister and deliver it to the IGS distribution system at the required pressure. Since the greatest need for inert gas is during offloading, the blower capacity is set at 125 percent of the maximum rated capacity of the cargo pumps. This provides a margin of safety to ensure that no air enters the cargo tanks. This capacity may be provided by two blowers of equal size, or by one large and one small blower. Separate inlet and discharge valves are fitted to each blower unit. On most plants, the valves are hand-operated, but on some the discharge valves are combined with the main and auxiliary pressure regulating valves.

5. Pressure Regulating Valve (Gas Regulating Valve, IGS Control Valve, Main Valve)

The pressure-regulating valve is used to adjust the pressure between the IGS and the cargo tanks. An overpressurized cargo tank can rupture if the pressure in the IGS value is too high. It is also important to prevent backflow from the cargo tanks, which could lead to inert or cargo gases entering the machinery spaces. A fire or explosion could occur if cargo gases mix with air and enter the boilers, the engines, or the IGG. The pressure-regulating valve is installed to regulate the flow of inert gas to the IGS deck main, maintain the IGS pressure, and prevent gas backflow when the IGS malfunctions or is shut down. The value position may be controlled either manually or automatically. For automatic control, the IGS pressure is used to set the valve in a pneumatic, hydraulic, or electric feedback control to maintain a constant pressure regardless of the rate cargo discharge.

NOTE: Electrical equipment in a hazardous location must be suitable, i.e., explosion-proof, intrinsically safe, or purged and pressurized.

6. Deck Water Seal

Introduction

a. Usually located on the main deck, the deck water seal is the primary safeguard to automatically prevent a reverse flow of cargo gas from a tank to the boilers, the engines, or the IGG. The deck water seal offers a positive break in the system by means of a water trap. This permits inert gas to be delivered to the main deck while preventing gas backflow, even when the IGS is shut down. The regulations require two independent water supplies for the deck water seal. When the IGS is operating, the scrubber pump supply is used; the second supply, normally the salt water service pump, is used when the IGS is not operating. Each pump must be capable of operation at all times. The deck water seal is provided with a heater to prevent the water from freezing and an automatic control system that prevents overheating of the seal. Although not required, a demister is usually fitted to remove entrained water. There is always a water layer through which the inert gas bubbles (see Figures C5-2 through C5-4).

Type Requirements

b. There are three general types of deck water seals: wet, dry, and semidry.

(1) The wet seal is described in Figure C5-2. It is deemed the most reliable and is the only type generally approved for use on U.S. vessels.

(2) The semidry seal operates dry after the IG flow displaces the water. Venturi action returns the water when a gas block is needed as described in Figure C5-3. This type of seal as been approved for U.S. vessels on a case-by-case basis, if the unit is quick-acting, has no moving parts, and has no sensors that are subject to failure.

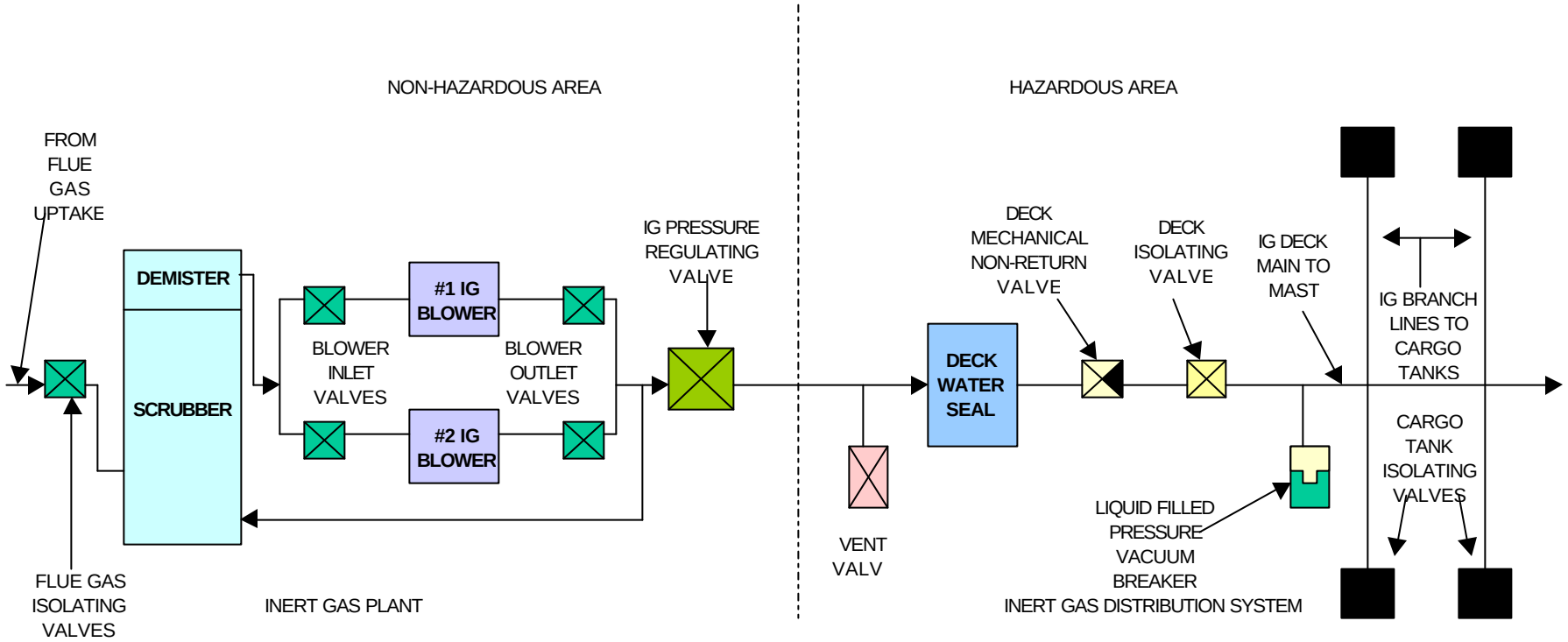
(3) The dry seal operates normally dry and is filled with water when the IG plant is shut down or when tank pressure exceeds the IG pressure. This system requires more operating parts, reacts slower and is not deemed as reliable as the wet type. Dry seals are not approved for use on U.S. vessels. See Figure C5-4 for a more complete description.

(4) A double block-and-bleed arrangement is used on some foreign vessels in place of the water seal. This involves two closely spaced valves to stop the inert gas flow (the "double block") plus a means to release (or "bleed") any gas trapped between the valves. This automatic device is not permitted on U.S. ships as a substitute for the required water seal.

7. Deck Mechanical Non-Return Valve

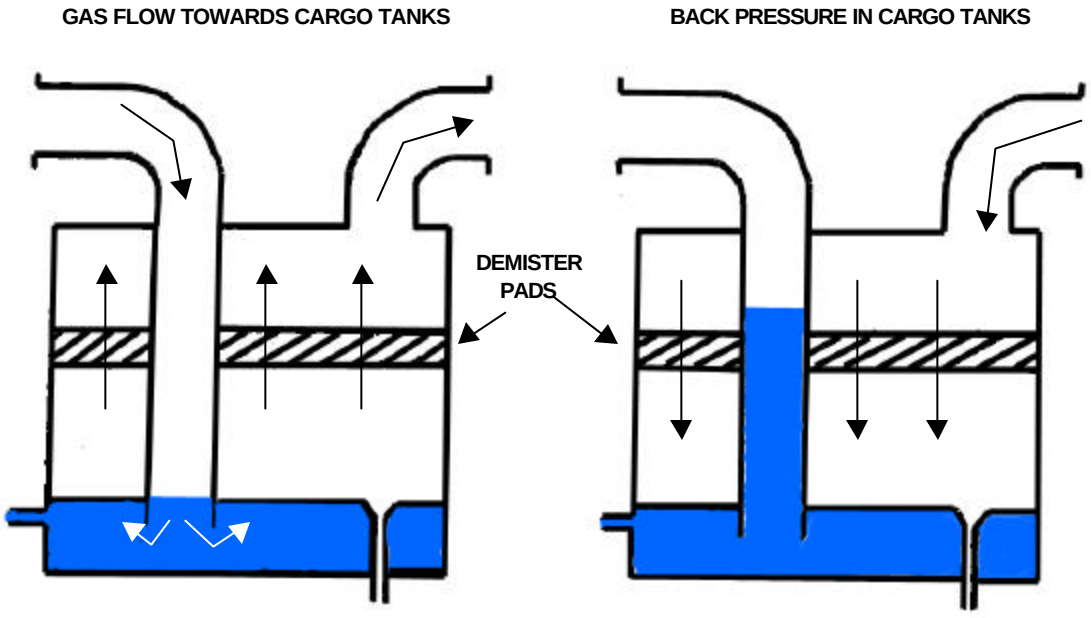
As an additional safeguard to prevent the backflow of gas from the cargo tanks, one or more mechanical non-return valves are installed on the cargo tank side and in series with the deck water seal.

FIGURE C5-2: TYPICAL IG SYSTEM COMPONENTS



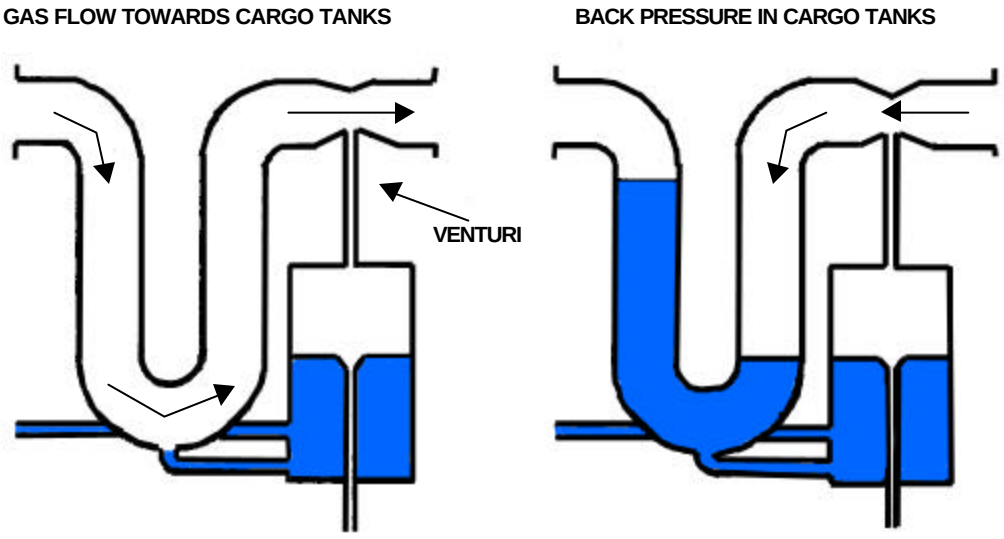
TYPICAL ARRANGEMENT FOR AN INERT GAS SYSTEM

FIGURE C5-3: DECK WATER SEAL — WET TYPE



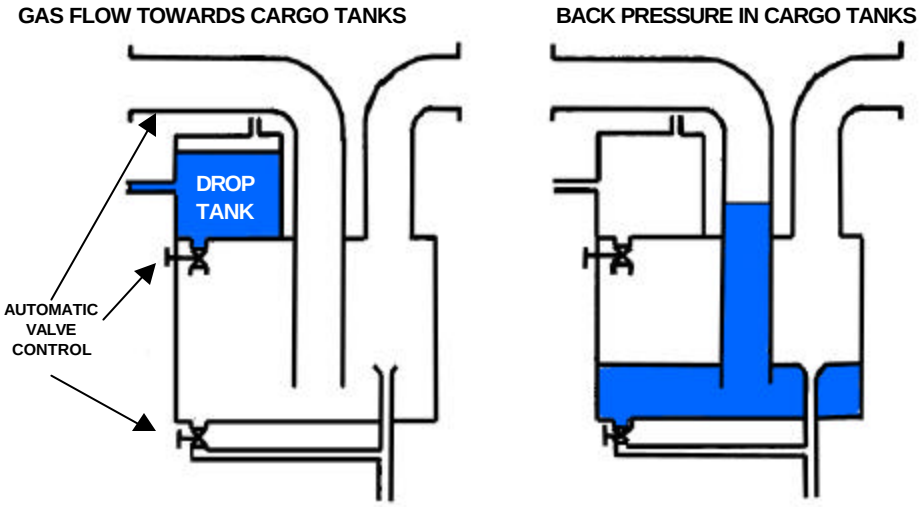
DECK WATER SEAL — WET TYPE

FIGURE C5-4: DECK WATER SEAL — SEMI-DRY TYPE



DECK WATER SEAL — SEMI-DRY TYPE

FIGURE 15-4: DECK WATER SEAL—DRY TYPE



DECK WATER SEAL — DRY TYPE

In the dry type seal, the water is drained from the seal when the IG plant is in operation (gas flowing to the tanks), and filled with water when the IG plant is either shut down, or the tank pressure exceeds the IG blower discharge pressure. Filling and drainage are performed by automatically operated valves controlled by the levels in the water seal and the drop tank, and by the operating state of the blowers. U.S. vessels must be equipped with seals that are completely passive in operation, so that failure of sensors, control systems, or moving parts cannot cause failure to establish a seal. Active seals, such as the dry seal shown above, are not acceptable.

8. Deck Isolating Valve (Main Isolating Valve)

This valve is used to isolate the inert gas plant from the deck distribution subsystem and the cargo tanks; it therefore constitutes the "first" barrier to any reverse flow of cargo tank gas when the IGS is started, tested, or secured. A second valve is necessary unless the deck mechanical non-return valve has a positive means of closure.

9. Deck Distribution System

This subsystem consists of a single inert gas main running the entire length of the cargo deck, starting at the deck isolating valve aft and ending at the vent valve forward. One or more pressure/vacuum devices are fitted to the inert gas main to prevent the cargo tanks from being over or under-pressurized. The inert gas main contains a means for receiving an outside source of inert gas when the IGS is not functioning. From the inert gas main, individual branch lines run to the cargo tanks. Stop valves or equivalent closures are fitted at each branch line, so that each cargo tank can be isolated from the inert gas system. If there is a connection between the inert gas main and the cargo piping system, there must be valves or similar closures to isolate the systems from one another.

10. Typical Gas Venting Arrangements

Venting System

a. Each tank vessel has a venting system that is capable of venting vapors displaced from the cargo tanks during loading and ballasting. There are also pressure/vacuum (P/V) valves to protect the cargo tanks from overpressure or vacuum resulting from thermal variation when the cargo tanks are isolated from the inert gas mains. Some of the possible arrangements are:

(1) A single common venting system, using the IGS deck main and branch lines from each tank and venting to the atmosphere through one or more mast risers or high-velocity vents. Precautions must be taken to prevent an arrangement by which tank vents can be blocked off;

(2) A common venting system, using a separate vent main and vent lines from each tank, with the system venting to the atmosphere through one or more mast risers or high-velocity vents; or

(3) Individual vents on each tank, using either standpipes (vent stacks) or high-velocity vents.

High Level Alarms

b. Tank high level alarms have been accepted in lieu of equal area venting required by 46 CFR 56.50-85(a)(7). However, precautions are necessary to prevent tank over pressurization during cargo or ballast loading. The oil transfer procedures, crude oil washing (COW), and equipment manual and ballasting instructions should include requirements for testing high level alarms and the proper positioning of valves for each type of operation.

11. System Documentation

Each tank vessel has an operating and maintenance manual. There are devices located downstream of the blowers to indicate the oxygen concentration, the IGS pressure and temperature, and means of automatically recording this information. The records of oxygen concentration and IGS pressure should remain aboard the vessel for at least 2 years.

D. GAS FLOW THROUGH THE IG SYSTEM

1. Introduction

Inert gas is provided from the main or auxiliary propulsion uptake point or from the IGG, and flows through the flue gas isolating valve or IGG isolating valve, to the IGS scrubber. Before entering the bottom of the "scrubbing tower," the gas is cooled by bubbling through a water seal or by passing through a water spray (see Figure 15-5 for a diagram of a typical IGS arrangement).

2. Water Flow

In the scrubbing tower itself, the gas moves upward through a supply of downward-flowing seawater. To maximize the contact between the gas and the water, several water layers created by one or more of the following arrangements may be used:

a. Spray nozzles;

b. Trays of "packed" stones or plastic shapes;

c. Perforated "impingement" plates; or

d. Venturi nozzles and slots. Seawater is supplied to the scrubber by an independent, continuously rated "scrubber pump." The saltwater service pump is normally piped into the system to provide a secondary or backup supply of seawater. The scrubber effluent ("wash" or "cooling water") is both warm and acidic, and special corrosion-resistant piping must be used to discharge it overboard. A vacuum breaker (U-bend) is necessary to prevent possible loss of water in the seal.

NOTE: The scrubber must have an adequate supply of salt water for the prescribed gas flow. A low saltwater level means that the scrubber will not work as designed or not at all.

Fresh water flushing facilities are provided so that all acidic solutions and all salt water may be removed from the scrubber when the IGS is shut down.

3. Refinement of the IG Mixture and Flow Control

At the top of the scrubbing tower, water droplets are removed from the inert gas mixture by one or more demisters. The operating blower draws the gas from the scrubber/demister unit under vacuum and delivers it to the inert gas distribution at the required pressure and volume. The total capacity of the blowers must be at least 125 percent of the maximum rated capacity of the cargo pumps. The blowers may be either steam turbine or electric powered. Steam inlet and return valves are manually operated, but both blowers can be controlled from the engine control room. To prevent the blowers from overheating when there is no demand for inert gas in the cargo tanks, and to allow gas concentration to be developed during startup, a recirculating line is fitted to return the blower discharge to the scrubber. Flow is controlled by recirculating or bypass valves, operated independently by gas flow demand, or in conjunction with the gas pressure regulating system.

4. Alternate Blower Arrange-ments

Some IGS blowers are used to gas free the cargo tanks in lieu of portable blowers or a separate fixed gas freeing blower system. In this arrangement, the installation is fitted to isolate the flue gas and substitute suction from the atmosphere. As with the scrubber, fresh water flushing facilities are fitted to remove acidic residues in the blower casings. The fresh air then passes through the pressure regulating valve, the deck isolating valve, the IGS main, and the individual branch lines into the cargo tanks.

E. INTERNAL INSPECTIONS OF IG SYSTEMS

1. Introduction

The marine inspector must appreciate the potential for introducing "dirty" or corrosive gas into the IGS by improper operating procedures or poor maintenance practices. This situation will create an environment for rapid system degradation or component failure. The following policy is not intended to be applied during routine testing of the IGS on either a U.S. or foreign tanker. Internal inspections are anticipated on U.S. tankers during biennial inspections for certification and drydockings. This cycle is considered a minimal requirement, as many manufacturer instruction manuals recommend that owners inspect various components of the IGS on an annual, semiannual, or weekly basis.

2. Specific Inspection Guidelines

Scrubber

a. Where feasible, all access plates and internal components such as demister pads and scrubber trays shall be removed. Soot and scale deposits shall be removed prior to the inspection. The following areas and internal components should be given close attention:

(1) Internal coatings should be completely intact. Check for signs of chipping or cracking, particularly around internal fastenings.

(2) Inspect gas inlet pipe in the scrubber water seal for corrosion and holes or leaking flanges, especially above the water level, that would allow gas to bypass the seal and render it ineffective.

(3) Closely inspect the internal area at the bottom of the scrubber for corrosion, especially in way of the effluent discharge line. Check the discharge line for clogging.

(4) Inspect float switches, temperature sensors, Venturi slots, impingement plates, packed trays, and demisters (as applicable) for damage, wastage, and corrosion.

(5) Ensure that the water heater (used to prevent water freezing) and its control system are in good condition.

(6) Inspect fresh and saltwater inlet piping for corrosion or wastage, and especially for holes or leaking flanges. Check spray nozzles for clogging and intact condition.

Valves

b. Boiler uptake (or IGG) valves, blower inlet and discharge valves, recirculating valves, pressure regulating valves, deck mechanical non-return valves, deck isolating valves, and IGS isolating valves shall be disassembled for inspection. Valve internals shall be inspected for cleanliness, and for signs of corrosion or erosion. Careful attention should be given to "butterfly" mechanisms to ensure free, smooth operation and proper seating. Check non-return valve seals. If accessible, either through inspection ports or disassembled components, the internal areas of the inert gas main and branch lines shall be checked for excessive scale buildup or soot deposits, which could result in a critical gas pressure drop between the IGS blowers and the cargo tanks.

Deck Water Seal

c. This shall be disassembled. Internal coatings shall be inspected for intactness; housing and heating coils, for corrosion; gas inlet pipes, for corrosion, holes, or leaking flanges (especially above the water level) that would permit gas to bypass the seal; and drain lines, for clogging or corrosion. The demister pads must be clean and free of soot and scale deposits. Check that the heater (used to prevent water freezing) and its control system are in good condition. Only the wet type of water seal is permitted; in this type there is always water present in the device and the inert gas flowing through the seal always bubbles through a layer of water. Semidry seals, in which water is not always present, are approved for U.S. vessels on a case-by-case basis. "Dry" water seals and the double block-and-bleed assemblies are not permitted aboard U.S. vessels.

Blowers

d. The inspection ports and access plates on all blowers shall be opened. Blower impellers, bearings, and casings shall be checked for corrosion or excessive buildup of deposits that may cause blade failure. If accessible, fresh water flushing spray nozzles shall be checked for intactness or clogging; the blower drain piping, for corrosion or clogging.

P/V Valves

e. P/V valves shall be disassembled and inspected for corrosion and the choking of flame screens from soot, oil entrainment, and rust. The forward pressure release valve shall be disassembled and the butterfly mechanism inspected for free, smooth operation and proper seating. If feasible, the liquid-filled, pressure/vacuum breaker shall be drained and inspected for sludge, sediment, or soot deposits that could render the component ineffective. High-velocity vent installations shall be inspected for internal deposits or corrosion that may reduce venting capacity or prevent tight closure.

Flue Gas Uptakes

f. If accessible, the flue gas uptake should be inspected for clogging from soot deposits when the boilers, engines, or IGG's are secured. On systems with IGG's, the combustion chamber shall be checked for soot, scale, or fuel deposits that could indicate improper combustion control or a distorted fuel spray pattern.

Calibration

g. Check the equipment used for the calibration of the fixed and portable gas concentration measurement devices.

F. OPERATIONAL INSPECTIONS

1. Introduction

The following tests shall be conducted on U.S. tankships during biennial and mid-period inspections and on foreign tankships, at each annual safety examination. On all vessels, these tests shall be conducted prior to allowing COW in a U.S. port. The scope of such tests must be sufficient to ensure that the IGS is operating within the manufacturer's design parameters and that the installed safeguards will operate as designed in the event of system malfunction. The marine inspector must review the manufacturer instruction manual and the vessel's operating and maintenance manual, and must be alert to conditions that must be simulated. In no case shall the inspector accept a manual that does not address specific safety precautions for the particular vessel.

2. Inspection Procedures

a. Externally inspect the condition of all piping and components, including scrubber, fans, valves, bellows expansion pieces, standpipes, and screens, for signs of corrosion and gas/effluent leakage.

b. Observe all IGS blowers in operation for proper operation and for excessive bearing noise or vibration. Ensure that the scrubber room ventilation system is operating.

c. Observe the operation of both the salt water scrubber pump and the pump used to provide an alternate salt water supply.

d. If the scrubber design uses a water seal, check for proper water level. Some foreign vessels are fitted with water sprays only, but U.S. vessels must have a wet type water seal.

e. Observe the deck water seal for automatic filling and check the water level with the local gauge, if possible. Check for the presence of water carryover (especially in the wet and semidry types) by opening the drain cocks on the IG main during operation. Check that the heater coil for cold weather operation is operational.

f. Check the operation of all remotely operated or automatically controlled valves, particularly the flue gas isolating valves. Check that there are functioning indicators showing whether the valves are open or shut.

g. If possible, check the level of the liquid in the pressure/vacuum breaker.

h. Check to ensure that all salt water supply pressure gauges, oxygen and gas pressure recorders, and temperature and pressure gauges are fully operational. The fixed inline oxygen analyzing equipment will be calibrated during the operation of the IGS. Observe a calibration check of the equipment by a qualified member of the ship's crew. Spot-check several recordings made since the last inspection during normal system operation for compliance with oxygen and pressure level requirements.

i. Examine the blower drives, the seawater pumps, valves, and strainers for the scrubber and the water seal; the piping connections at the scrubber; water seals; and the shell plating.

j. Observe that all portable instruments are properly calibrated and operating as required by the manufacturer instruction manual. These may include an oxygen analyzer, a combustion gas indicator, and a hydrocarbon gas indicator. Sample points should be provided for the use of portable instruments for monitoring cargo tank atmospheres.

k. If an IGG is used, examine the automatic combustion control system, the combustion chamber and its mountings, the forced draft fan, and both fuel oil service pumps.

3. Operational Tests

a. The operation of both audible and visual alarms should be observed in the cargo control room, the engine control room, and the pilothouse. The marine inspector shall consult the manufacturer instruction manual and the ship's operation and maintenance manual for guidance in establishing proper test procedures. Simulation may be necessary for some tests. However, simulation tests of the alarm panel shall not be accepted as evidence of satisfactory operation of the following alarm and safety shutdown systems:

(1) High oxygen content of gas in IGS main; alarms activated at an 8 percent concentration.

(2) Low gas pressure in IGS main downstream of all non-return devices; alarms activated at 100mm (4 inches) water gauge. An automatic shutdown of the cargo pumps may be fitted on some vessels. Also, high gas pressure in the IGS main downstream of all non-return devices.

(3) A low level water alarm, high level water alarm, or low flow pressure alarm fitted to the deck water seal to shut down the IGS blowers automatically.

(4) IGS blower high discharge temperature alarm that will automatically shut down the IGS blowers and the gas regulating valve; alarms activated at 150°F (65.6°C) or less for U.S. vessels and at temperatures indicated in approved operation manual for foreign vessels.

(5) High gas pressure of the inert gas supply forward of the non-return devices.

(6) IGS blower failure alarm and automatic shutdown of main or regulating valve.

(7) Power supply failure for the automatic control system gas regulating valve and the indicating devices showing the proper quantity and quality of the inert gas supply.

(8) Insufficient fuel oil supply to the IGG and the failure of the power supply to the IGG.

b. Conduct backflow pressure test of water seal and non-return valve.

c. Test interlocking of soot blowers. The IGS will automatically shut down if soot blowers are operated.

d. Test for automatic shutdown of the gas pressure regulating valve when the IGS blowers are secured.

e. Test the automatic combustion control features of the IGG (if used) in accordance with standard combustion test procedures for automatic auxiliary heating equipment (see 46 CFR 63).

f. Test IGS remote shutdown required by 46 CFR 111.103.9.

G. SAFETY PRECAUTIONS

1. Introduction

The purpose of an IGS is to establish positive pressure in a cargo tank with an atmosphere that will not support combustion. If an atmosphere will not support a fire, it will not support life. Clearly, such an inerted, pressurized atmosphere is highly dangerous, producing unconsciousness and death in a short period. The following guidance is intended to make inspectors aware of the fundamental steps that must be taken to ensure IGS safety.

2. References

In addition to this chapter of the Marine Safety Manual (MSM), the inspector should consult the following sources:

a. 46 CFR 32.53;

b. The American Bureau of Shipping (ABS) Rules for Building and Classing Steel Vessels, Appendix B, Regulation 10;

c. SOLAS 74/78, Chapter II-2, Part E, Regulation 62, and amendments;

d. The manufacturer instruction manual;

e. The vessel's operating and maintenance manual; and

f. Commandant's International Technical Series (CITS), Volume VII (USCG CITS-80-1-1), "Regulations and Guidelines for Inert Gas Systems."

3. Requirements for an Escort

The marine inspector must always have a ship's officer or port engineer trained in the operation of the IGS along as an escort. The ship's officer or the port engineer will oversee all required tests and inspections.

4. Personal Caution

Always stand well clear of any ullage opening when the cover is being removed, even though the cargo tank pressure has been lowered to a "safe" level. Wear protective goggles and clothing when conducting internal inspections of the system. Remember that the potentially corrosive nature of the dirt, scale, and soot associated with the internals of an IGS can irritate or damage your skin and eyes.

5. Requirements for Tank Entry

The marine inspector shall, under no circumstances, enter a cargo tank when the IGS is operating, or when the tank or the adjacent tanks have been inerted, unless the following steps are taken:

a. The cargo tank shall be certified "safe for workers" by a certified marine chemist.

b. Pressure on the remainder of the system shall be lowered to 200mm (8 inches) water gauge to minimize the possibility of IGS leakage into the "gas-free" cargo space.

c. The IGS branch line control valve to that tank shall be closed, with a person stationed at the ullage opening within clear view of the valve. This person should be wearing a self-contained, pressure-demand breathing apparatus, ready for immediate use, and should be provided with a rescue lifeline and a standby person positioned as noted above.

NOTE: If an isolation blank is fitted instead, it shall be wired closed with the label "Personnel in cargo tank."

d. Drain lines (if fitted) from the IGS main to that cargo tank shall be secured.

e. The relevant cargo line valve shall be closed.

f. The cargo tank shall be continually vented and regularly tested with the portable oxygen analyzer.

g. An approved self-contained, pressure-demand breathing apparatus shall be worn for immediate use if needed. It shall be equipped with a belt-mounted, calibrated oxygen/combustion gas indicator in continuous operation.

6. Ventilation Requirements

If the IGS is secured and the IGS blowers are being used to purge and ventilate the cargo tanks, the branch valve must be left opened. In this case, ensure that the spectacle blank or valve downstream of the boiler uptake valve is in place and that a person is stationed at that blank.

7. Branch Line Inspections

Never inspect the flue gas bellows or scrubber unless: all branch line spectacle blanks are in place (or branch line isolation valves are closed); the spectacle blank downstream of the boiler uptake valve is in place; isolation valves are closed; and the IGS has been purged and certified "safe for workers" by a marine chemist. If a boiler is operating, require a person to be stationed at the spectacle blank downstream of the boiler uptake valve.

8. Internal Inspections of Enclosed Spaces

When conducting internal inspections of pumprooms, cofferdams, permanent ballast tanks, and fuel oil tanks on tank vessels fitted with IGS, be aware that inert gas may have leaked into such tanks or compartments. While inspecting the tank or compartment, the inspector shall be equipped with an emergency escape breathing apparatus (EEBA) and a belt-mounted, calibrated oxygen/combustion gas indicator that is in continuous operation. Always test for sufficient (at least 19.5 percent) oxygen first, then test for vapors above 10 percent of the lower flammable limit.

> **NOTE:** A combustion gas indicator will not give an accurate indication of the percentage of hydrocarbon gas in an oxygen-deficient atmosphere. A hydrocarbon gas content meter must be used to determine whether hydrocarbon vapors are present in an inerted tank or compartment.

H. PRESSURIZATION OF IG SYSTEMS

1. General Requirements

The operational requirements in 46 CFR 32.53-5 require the master to ensure that the IGS is operated as necessary to maintain a positive pressure on the cargo tanks. This requires the tank to be sealed at all times except when the tank is either gas-free or carrying a cargo that cannot produce a flammable atmosphere. For certain cargoes, the cargo purity is of critical importance; thus, the cargo tanks must be gas-freed and entered prior to loading. In such instances, standard gas-freeing procedures must be followed.

2. During Periods of Cargo Access

The high costs of crude oil and petroleum products can require cargo level measurement and cargo sampling before and after loading, and before and after the cargo is transferred. When manual measurement or cargo sampling is being conducted, no cargo or ballasting operation shall be performed. The following requirements shall apply:

a. A minimal number of small tank openings may be uncovered for as short a time as necessary to perform measurement or sampling.

b. If tanks are thus opened prior to cargo transfer, the tanks shall be repressurized before beginning the transfer.

c. If tanks are thus opened after cargo transfer, the tanks shall then be repressurized before beginning another transfer or the vessel leaves port.

d. Neither cargo transfer nor movement of the vessel shall begin until all conditions have been checked and are in order.

e. During cargo transfer operations, the oxygen content and pressure of the inert gas in the IG main shall be continuously recorded.

f. These instructions shall be contained in the system operating manual required by 46 CFR 32.53-85.

CHAPTER 1: GENERAL ASPECTS OF PORT STATE CONTROL EXAMINATIONS

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CHAPTER 1: GENERAL ASPECTS OF PORT STATE CONTROL EXAMINATIONS

A. INTRODUCTION

Foreign vessels operating in U.S. waters are subject to inspection under Title 46 United States Code (U.S.C.) Chapter 33. Reciprocity is accorded to vessels of countries that are parties to the International Convention for the Safety of Life at Sea (SOLAS) (46 U.S.C. 3303(a)). In addition, certain provisions of the pollution prevention and navigation safety regulations (33 Code of Federal Regulations (CFR) 154-156 and 164, respectively) apply to foreign vessels operating in U.S. waters. The extent of application of these laws and regulations has been modified in many cases by international conventions. This chapter explains the application of the laws, convention agreements and regulations that apply to all foreign vessels operating in U.S. waters.

B. BACKGROUND

1. Port State Control

Port State control is the process by which a nation exercises its authority over foreign vessels when those vessels are in waters subject to its jurisdiction. This authority is derived from several sources both domestic and international. A nation may enact its own laws and regulations imposing requirements on foreign vessels trading in its waters (i.e. the double hull requirements imposed under the Oil Pollution Act of 1990 (OPA 90), or the navigation safety regulations found in 33 CFR part 164). In addition, nations which are party to certain international conventions (i.e. SOLAS, International Convention on Load Lines 1966 (ICLL); International Convention for the Prevention of Pollution from Ships 73/78 (MARPOL); the International Convention on Standards of Training Certification and Watchkeeping for Seafarers, 1978, as amended in 1995 (STCW 95); and International Labor Organization Convention No. 147, The Convention Concerning Minimum Standards in Merchant Ships (ILO 147)) are empowered to verify that vessels of other nations operating within their waters comply with these conventions, and to take action to bring these ships into compliance if they do not. The U.S. exercises its port state control authority through the U.S. Coast Guard's long standing foreign vessel boarding program, now referred to as the Port State Control Program. This program is administered in G-MOC-4, International Compliance and Outreach Division (ICOD). Interested parties can access more information on the PSC program through the Coast Guard's web page at http://www.uscg.mil/hq/g-m/psc/psc.htm.

Purpose. Through its Port State Control (PSC) Program, the Coast Guard verifies foreign flagged vessels operating in U.S. waters comply with applicable international conventions, U.S. laws and U.S. regulations. Through the program, boardings are focused on those vessels most likely to be substandard based on identified risk factors. When vessels that are not in substantial compliance with applicable laws or regulations are identified, the Coast Guard imposes controls to ensure they are brought into compliance. The program goal is to identify and eliminate substandard ships from U.S. waters. The term "substandard ship" is defined in Section C. 13 of this Chapter.

C. DEFINITIONS AND TERMS OF REFERENCE

1. Boarding Attending a vessel to conduct an examination, cargo monitor, cargo loading supervision, deficiency check, or other Coast Guard business.

2. Bulk This term identifies any cargo that is loaded directly into a hold or tank on a vessel with no intermediate form of containment (e.g. packaging, containers or portable tanks). See SOLAS CH. IX for the definition of bulk carrier under auspices of the ISM Code.

3. Cargo Control Area The term "cargo control area" means the usual station of the person-in-charge during bulk liquid transfer operations (including bunkering). The cargo control room is considered a cargo control area. A vessel may have more than one cargo control area (i.e., one for cargo and one for bunkering).

4. Clear Grounds Evidence that the ship, its equipment, or its crew do not correspond substantially to the requirements of the relevant conventions or that the master or crew members are not familiar with essential shipboard procedures relating to the safety of ships or the prevention of pollution. Examples of "clear grounds" are listed in Section K of this chapter.

5. Contracting Governments and Parties Government or flag states that have legally accepted to be bound by the requirements of a convention, protocol or other instrument.

6. Contravention An act, procedure, or occurrence that is not in accordance with a convention or other mandatory instrument, or its operational annex.

7. Control The process of imposing a port State's or flag State's authority over a vessel to ensure that its structure, equipment, operation and crew meet applicable standards. The process is effected by any verbal or written directives of the Officer in Charge Marine Inspection (OCMI) or Captain of the Port (COTP) or their representatives which requires action or compliance by the crew or other persons responsible for a vessel. Control may take several forms including requiring corrective action prior to returning to the U.S., requiring a vessel to proceed elsewhere for repairs, denying entry into port, or detaining a vessel in port.

8. Deficiency A condition found not to be in compliance with the conditions of the relevant convention, law or regulation.

9. Detention Intervention action taken by the port State when the condition of the ship or its crew does not correspond substantially with the applicable conventions to ensure that the ship will not sail until it can proceed to sea without presenting a danger to the ship or persons on board, or without presenting an unreasonable threat of harm to the marine environment. Detentions may be carried out under the authority of SOLAS 1974 as amended, Regulation 19; ICLL Article 21; MARPOL Article 5; STCW Article X and Regulation 1/4; ILO 147 Article 4; the Ports and Waterways Safety Act; or a U.S. Customs hold.

10. Examination The process of assessing a vessel's compliance with the relevant provisions of applicable international conventions, domestic laws and regulations. The scope of an examination shall be to the extent necessary to verify the validity of the relevant certificates and other documents, and to ensure that no unsafe conditions exist. An examination may include, but is not limited to, checks of documents, certificates, manuals, the vessel's structural integrity, machinery, navigation, pollution prevention, engineering and safety systems, maintenance programs and crew proficiency.

11. Intervention A control action taken by a port State in order to bring a foreign flag vessel into compliance with applicable international convention standards. Interventions are undertaken by a port State when a vessel's flag State has not, can not, or will not exercise its obligations under an international convention to which it is a party. This may include requesting appropriate information, requiring the immediate or future rectification of deficiencies, detaining the vessel, or allowing the vessel to proceed to another port for repairs. An intervention is not synonymous with a detention.

12. Non-Conforming Ship Any vessel failing to comply with one or more applicable requirements of U.S. law or international conventions is a nonconforming ship. A nonconforming ship is not necessarily a substandard ship unless the discrepancies endanger the vessel, persons on board, or present an unreasonable risk to the marine environment; the vessel may or may not need to be detained.

13. Substandard Ship

In general, a vessel is regarded as substandard if the hull, machinery, or equipment, such as lifesaving, firefighting and pollution prevention, are substantially below the standards required by U.S. laws or international conventions, owing to:

a. The absence of required principal equipment or arrangement;

b. Gross noncompliance of equipment or arrangement with required specifications;

c. Substantial deterioration of the vessel structure or its essential equipment;

d. Noncompliance with applicable operational and/or manning standards; or

e. Clear lack of appropriate certification, or demonstrated lack of competence on the part of the crew.

If these evident factors as a whole or individually endanger the vessel, persons on board, or present an unreasonable risk to the marine environment, the vessel should be regarded as a substandard ship, and should be detained.

14. Valid Certificates

A certificate that has been issued directly by a contracting government or party to a convention, or on the behalf of the government or party by a recognized organization, and contains accurate and effective dates, meets the provisions of the relevant convention, and corresponds to the particulars of the vessel and its equipment.

D. ISSUANCE OF SOLAS CERTIFICATES

The Coast Guard will issue SOLAS 74 certificates in accordance with the Convention only in cases of emergency. Over the past several years, Marine Safety Offices have been performing SOLAS Safety Equipment surveys aboard foreign flagged vessels at the request of the flag Administration. Vessel operators know well in advance when their surveys are due. SOLAS 74/78 provides for extensions to these surveys for up to five months after the expiration date of the Safety Equipment certificate. This is considered more than adequate time for governments to provide inspectors to carry out these surveys or to provide extensions until their surveyor can attend the vessel. Effective immediately, all SOLAS surveys will be conducted in cases of emergency only.

E. BOARDING TEAMS

Boarding teams are normally comprised of a marine inspector and one or more boarding officers. Boarding teams conducting Priority I boardings shall include a marine inspector who also has the appropriate vessel qualification. Boarding teams conducting tanker and passenger vessel examinations, biennial Letter of Compliance examinations and quarterly passenger vessel re-examinations shall include a senior marine inspector. Boarding teams conducting other types of boardings, including annual cargo ship exams, should include a marine inspector if resources permit. At a minimum, such boarding teams should consist of at least two Coast Guard members, at least one of whom must have a Foreign Freight Vessel qualification.

1. At Sea Boardings

When conducting at-sea boardings in cooperation with Area or Group commands outside of the Marine Safety Program, boarding team members will be provided by the Marine Safety Office. Operational commanders will, however, retain the discretion to configure the boarding teams to meet operational situations, including the use of law enforcement qualified personnel, as necessary, to ensure the safety of the boarding team.

2. On-the-Job Training (OJT)

On-the-Job Training for Regular and Reserve personnel is encouraged. However, every effort should be made not to delay vessels as a result of Coast Guard training initiatives. Unless an agreement is reached with a particular vessel owner or operating company, low priority vessels should not be boarded to meet Coast Guard training needs. (Reward low risk vessels by boarding them less frequently.) Unless a larger number is agreed to by a vessel's owner or operator in advance, the number of trainees accompanying a boarding team should be limited to 1 or 2 so as not to overwhelm a vessel's crew, or create undue confusion aboard the vessel.

F. PORT STATE CONTROL (PSC) EXAMINATIONS

Foreign vessel examinations may be initiated by the Coast Guard, requested by another flag State administration on the basis of information regarding a potential substandard ship, or based on information regarding a substandard ship provided by members of a ship's crew, a professional body, an association, a trade union or any other involved individual. Port State Control examinations are not intended, nor desired, to be analogous to an inspection for certification of a U.S. flagged vessel. Rather, they are intended to be of sufficient breadth and depth to satisfy a boarding team that a vessel's major systems are in compliance with applicable international standards and domestic requirements, and that the crew possesses sufficient proficiency to safely operate the vessel. The examinations are designed to determine that required certificates are aboard and valid, and that a vessel conforms to the conditions required for issuance of required certificates. This is accomplished by a walk through examination and visual assessment of a vessel's relevant components, certificates and documents, and must be accompanied by limited testing of systems and the crew. When the examination reveals questionable equipment, systems, or crew incompetence, the boarding team may expand the examination to conduct such operational tests or examinations as deemed appropriate.

1. Types of Port State Control Examinations

U.S. Coast Guard port state control examinations consist of annual examinations, reexaminations or deficiency follow-up examinations. Any of these examinations may be broadened in scope or depth into an expanded examination, if clear grounds exist that lead a boarding team to believe that the condition of the ship or its equipment does not correspond with the certificates or the ship does not comply with applicable laws or conventions. Monitors of oil or hazardous materials transfers, and supervision of explosives or radioactive materials transfers may be conducted in conjunction with any Port State Control examination.

Annual Examinations

a. Annual Examinations. An annual tankship or passenger examination or an annual cargo ship examination consists of the specific procedures outlined in the freight, tank, or passenger vessel examination books, and other sections of the Marine Safety Manual. It shall normally consist of an examination of the vessel's certificates, licenses and documents, and a general examination of the entire vessel include examining and testing specific equipment, and conducting operational testing and emergency drills with the vessel's crew. This examination may be expanded as necessary if "clear grounds" exist to indicate that a vessel is not in compliance with applicable U.S. laws or international conventions.

Reexaminations

b. Reexaminations. A reexamination is an examination to ensure that a vessel has remained in compliance with appropriate U.S. laws or international conventions between annual examinations. It shall normally consist of an examination of the vessel's certificates, licenses and documents, and a general examination conducted by walking through the vessel. Except aboard passenger vessels, a reexamination will not normally include operational testing or drills. However, a reexamination may be expanded as necessary if "clear grounds" exist to indicate that a vessel is not in compliance with applicable U.S. laws or international conventions.

Expanded Examinations

c. Expanded Examinations. An expanded examination is a more detailed examination or testing conducted when, during an annual examination, reexamination, or deficiency follow-up, the boarding team's examination establishes "clear grounds" for believing that the condition of a vessel, its equipment, or crew do not correspond substantially with the particulars of the certificate. Expanded examinations should focus on those areas where "clear grounds" have been established and should not include other areas or systems unless the general impressions or observations of the boarding team support such examination.

Deficiency Follow-Up

d. Deficiency Follow-Up. A deficiency follow-up is an examination performed to ensure previously identified deficiencies have been corrected. A deficiency follow-up may be limited in scope to an examination of the specific items identified as deficiencies during a previous boarding. If more than 30 days have passed since deficiencies were issued, or evidence of additional deficiencies is observed during the boarding, a reexamination should be conducted.

Monitor

e. Monitor. A monitor is the process of witnessing any part of a bulk or break-bulk cargo operation, any part of a bunkering operation, or any part of a lightering operation. The visit need not occur during critical phases (commencing, topping off, or securing of transfer operations). It must focus on the procedural and operational aspects, or human element, of the transfer. When monitors are performed, they should be conducted in conjunction with annual examinations, reexamination or deficiency follow-up examination.

Cargo Supervision

f. Cargo Supervision. Cargo supervision is the process of supervising explosives or radioactive materials transfers. Supervisions differ from monitors in that the boarding team must be present during the entire transfer from beginning to end. Special requirements for the cargo carried must be enforced. For vessels carrying military and commercial explosives, 49 CFR 176, Subpart G must be adhered to. Further guidance is contained in MSM II-F5.E. For vessels carrying highway route controlled quantities of radioactive material, 49 CFR 173, Subpart I and 49 CFR 176, Subpart M, must be adhered to. Further guidance is contained in MSM II-F5.C.5, of this volume.

NOTE: For specific guidance applicable to foreign passenger vessels, see MSM II-D7; for specific guidance applicable to foreign tank vessels, see MSM II-D6; and for specific guidance applicable to foreign freight vessels, see MSM II-D5.

2. Cargo Ship Safety Certificate (CSSC)

The 1988 Protocol to SOLAS 74 allows flag States to issue a Cargo Ship Safety Certificate (CSSC) in lieu of the present Cargo Ship Safety Equipment (SEC), Construction (SCC), and Radio Certificates (SRC). Although this protocol has not as yet come into force universally, IMO Resolution A.718(17) encourages early implementation. Accordingly, some countries such as the Netherlands have chosen to implement this certificate. The CSSC is similar to the Passenger Ship Safety Certificate (PSSC) except it is valid for up to five years while the PSSC is valid for only one. The CSSC does require annual endorsements. All units are to accept CSSC'S provided that they are not expired and properly endorsed. The VFLD product set of MSIS does not, as yet, have a code for the CSSC. In the interim, units are to enter the issue/expire dates from the CSSC into the fields for the SEC, SCS and the SRC. Also a PSPI is to be entered stating that the vessel has a CSSC in lieu of the SEC, SCC, and SRC.

3. Procedures Applicable to Vessels of Non-Parties and Vessels to which Conventions do not Apply

Article II (3) of SOLAS 74/78, Article 5(4) of MARPOL 73/78, and Article X (5) of STCW provide that no more favorable treatment is to be given to the vessels of countries that are not party to these conventions.

Vessels of Foreign Nations Not Party to SOLAS and Vessels below Convention size

a. Vessels of Foreign Nations Not Party to SOLAS and Vessels below Convention size. Vessels of foreign nations not party to SOLAS and vessels below convention size may be inspected in accordance with U.S. vessel inspection statutes and regulations (46 USC 3301). In the course of such inspections, due consideration should be given to acceptance of materials and equipment that do not conform exactly to the requirements of U.S. regulations. Masters, owners and agents of foreign vessels shall forward written applications for inspection to the cognizant OCMI. A vessel that satisfactorily completes inspection shall be issued a U.S. Certificate of Inspection prescribed in 46 CFR 2.01-5. In lieu of performing an inspection for certification for vessels of foreign nations not party to SOLAS or vessels below Convention size, OCMI's may perform a Port State Control examination. When assessing whether a Port State Control examination is appropriate, the following factors should be considered: Size and type of ship; equipment provided; type of cargo; and the certificates and documents issued to the vessel on behalf of their flag State. The Port State Control examination should follow the procedures of this Chapter and IMO Resolution A.787(19), Procedures for Port State Control, to verify that an equivalent level of safety and protection of the marine environment is achieved. The condition of the vessel, certification of the crew, and the flag State's minimum manning standard shall be compatible with the aims of the Convention and U.S. laws and regulations.

Vessels of Countries Not Party to MARPOL 73/78

b. Vessels of Countries Not Party to MARPOL 73/78. Guidance regarding vessels of countries that are not party to MARPOL 73/78 may be found in 33 CFR 151.21.

4. Canadian Vessels

Under 46 USC 3303, vessels having a valid certificate of inspection issued by a flag State having inspection laws and standards similar to our own are subject only to an inspection to ensure that the condition of the vessel's propulsion equipment and lifesaving equipment are as stated on the certificate. Currently, only Canadian vessels are recognized as having laws and standards similar to our own. On 29 March 1995, reciprocity was extended to Canadian barges that carry oil in bulk. These barges will no longer be subject to inspection under 46 CFR, Subchapter D when operating in U.S. waters with valid Canadian Letters of Compliance. Such vessels continue to be subject to all other applicable laws and regulations. As with all foreign flagged tank vessels, Canadian oil barges operating in U.S. waters will be subject to annual tank vessel examinations and must possess a valid Tank Vessel Examination Letter issued in accordance with 46 USC 3711.

5. Taiwanese Vessels

Taiwanese vessels are issued non-convention certificates that attest to compliance with all SOLAS requirements. Such certificates are considered to have force equal to that of SOLAS certificates. Accordingly, Taiwanese vessels need not undergo inspection for certification.

6. Caribbean Vessels under 500 GT

As of 1 January 1998, freight vessels under 500 gross tons trading to U.S. ports within the Seventh District must have a flag State certificate attesting to compliance with the new vessel standards of the Caribbean Cargo Ship Safety Code (Code). Alternatively, a foreign flagged freight vessel less than 500 gross tons operating in the Caribbean region may submit to an inspection by the Coast Guard, leading to the issuance of a Certificate of Inspection, that will authorize limited service in U.S. waters. The basis for the inspection will be the standards contained in the Code, unless inspection under U.S. regulations is requested. The Code can be accessed via the PSC web site referenced in MSM II-D1.B.1.

G. ANNUAL EXAMINATIONS

An annual examination, as appropriate, consists of the specific procedures outlined in the freight, tank, or passenger vessel examination books and the Marine Safety Manual. It should include an examination of the vessel's certificates, licenses and documents followed by a general examination, i.e. "walk through" of the vessel. It shall also include examination and testing of specific equipment and conduct of operational testing and emergency drills to ensure the crew's proficiency at carrying out critical tasks. Annual examinations shall be conducted on all tank and passenger vessels, and cargo vessels. At a minimum, the following items shall be part of each annual examination.

1. Certificates, Licenses and Documents

The document check should include the following as appropriate:

General Operational Documents	
❑ Certificate of Registry	❑ Oil Transfer Procedures
❑ Classification Society Certificate	❑ Dangerous Cargo Manifest
❑ Stowage Plan	❑ Hazardous Materials Training Records
❑ Cargo Record Book	❑ Cargo Securing Manual
❑ International Tonnage Certificate (1969)	
SOLAS Documents	
❑ Safety Construction Certificate	❑ Cargo Ship Safety Radiotelegraphy Certificate
❑ Cargo Ship Safety Equipment Certificate	❑ Cargo Ship Safety Radiotelephone Certificate
❑ Passenger Ship Safety Certificate	❑ Cargo Ship Safety Radio Certificate
❑ Exemption Certificates	❑ ISM Certificates: Document of Compliance (DOC) & Safety Management Certificate (SMC) (refer to NVIC 4-98 for ISM enforcement guidance)
Pollution Prevention/Response-Related Documents	
❑ Certificate of Financial Responsibility	❑ Shipboard Oil Pollution Emergency Plan (SOPEP)
❑ Oil Record Book, Parts 1 & II	❑ OPA 90 Vessel Response Plan (VRP)
❑ Pollution Prevention Compliance Letter	❑ Garbage Management Plan
❑ International Oil Pollution Prevention Certificate or equivalent	❑ International Certificate of Fitness for Carriage of Liquefied Gases in Bulk
❑ International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk	❑ International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk
Load Line and Stability-Related Documents	
❑ International Load Line Certificate (1966)	❑ Stability information
❑ International Load Line Exemption Certificate	
Manning-Related Documents	
❑ Safe Manning Document	❑ Crew Licenses or Certificates of Competency

- ❑ Medical certificates, of ILO Convention No. 73 concerning Medical Examination of Seafarers

2. General Examination The general examination (i.e. "walk through") portion of the annual examination should be conducted with the following purposes in mind:

Structure

a. Structure. The boarding team should develop an impression of shell maintenance and the general state of the deck and side shell of the vessel to determine its seaworthiness.

Deck Portion

(1) Deck Portion. The condition of such items as ladderways, guardrails, firemains, piping, hatch covers, watertight and weathertight closures, and deck plating should be observed. Areas of extensive corrosion or pitting should influence the decision as to whether it is necessary to make the fullest possible examination of the structure with the vessel afloat.

Hull Portion

(2) Hull Portion. Significant areas of damage, cracking, wastage, corrosion, or pitting of plating and associated scantlings in decks and hull affecting seaworthiness or strength to take local loads may justify detention. When practical, internal structural members visible from deck in open cargo bays or upper wing tanks should be observed. The boarding team should be vigilant to evidence of improper temporary repairs, soft patches, recent welding or other hot work, and seepage from fuel, cargo or ballast tanks and sideshell plating.

Ballast Tank Entry

(3) Ballast Tank Entry. Due to concern for the personal safety of marine inspectors, entry into ballast tanks is no longer part of a port state control boarding for chemical tankers, liquefied natural gas carriers, and liquid petroleum tankers. The policy of annual ballast tank entry and examination on foreign oil tankers over 10 years old is outlined in MSM II-D6.C.6.c.

Load Lines

(4) Load Lines. The boarding team should pay particular attention to closing appliances, the means of freeing water from the deck, and arrangements for the protection of the crew. Items such as defective hatch closing arrangements, multiple missing dogs, corroded vents and wasted coamings may warrant further examination.

Seaworthiness

(5) Seaworthiness. Damage not affecting seaworthiness will not constitute grounds for judging that a vessel should be detained, nor will damage that has been temporarily but effectively repaired for a voyage to a port for permanent repairs. However, in assessing the effect of damage, the boarding team should regard the location of crew accommodations and whether the damage substantially affects its habitability.

Voyage Damage

(6) Voyage Damage. Voyage damage that is being properly addressed by the vessel's crew, owner, classification society or flag State without prompting from the Coast Guard should not constitute grounds for detaining a vessel. Other control measures, (i.e. requiring tug assists, daylight transits, portable pumps or generators etc.) may be imposed through a COTP Order in these cases. However, if voyage damage is not being properly addressed, or it appears that the vessel intends to depart port in an unseaworthy condition, the OCMI/COTP should consider taking immediate steps to detain the vessel. Substitution of liferafts for a damaged lifeboat (with the approval of the Flag Administration, or other organization that issued the Safety Equipment Certificate), should be evaluated to ensure that 100% of the crew will be accommodated, and that another boat (rescue or lifeboat) is available for marshalling rafts.

Machinery Spaces

b. Machinery Spaces. The boarding team should assess the condition of the machinery and the electrical installations such that they are capable of providing sufficient continuous power for propulsion and auxiliary services.

Operation

(1) Operation. The boarding team may determine if responsible personnel are familiar with their duties related to operating machinery such as:

(a) Emergency and standby electrical power sources.

(b) Auxiliary steering gear.

(c) Bilge and fire pumps.

(d) Any other equipment essential in emergency situations.

Maintenance

(2) Maintenance. During examination of the machinery spaces, the boarding team will form an impression of the standard of maintenance. Frayed or disconnected wires, disconnected or inoperative reach rods, quick closing valves or machinery trip mechanisms, missing valve hand wheels, evidence of chronic steam, water and oil leaks, dirty tank tops and bilges, or extensive corrosion of machinery foundations are indicative of poor maintenance. A large number of temporary repairs, including pipe clips or cement boxes, indicates a reluctance to make permanent repairs.

Tests and Trials

(3) Tests and Trials. While it is not possible to determine the condition of the machinery without performance trials, general deficiencies such as leaking pump glands, dirty water gauge glasses, inoperable pressure gauges, rusted relief valves, inoperative or disconnected safety or control devices, evidence of repeated operation of diesel engine scavenger belt or crankcase relief valves, malfunctioning or inoperative automatic equipment and alarm systems, and leaking boiler casings or uptakes, would warrant inspection of the engine room log book and investigation into the record of machinery failures and accidents and a request for running tests of machinery.

Oil and Oily Mixtures

(4) Oil and Oily Mixtures. By taking into account the quantity of oil residues generated, the capacity of sludge and bilge water holding tanks, the capacity of the oily water separator, and the oil record book, the boarding team may determine if reception facilities have been used and note any alleged inadequacies of such facilities.

Sufficient Power

(5) Sufficient Power. If one electrical generator is out of commission, the boarding team should investigate and test whether power is available to maintain essential and emergency services.

Remote Shut-Off Valve for Tanks Less Than 500 Liters

(6) Remote Shut-Off Valve for Tanks Less Than 500 Liters. Regulation II-2/15.2.5 of SOLAS 74 (amended) requires every fuel oil pipe from a storage, settling or daily service tank to be fitted with a means to secure flow from outside the space in which the tank is situated. The U.S. accepts the IMO interpretation of SOLAS II-2/15.2.5 that was adopted at the 69th session of the Marine Safety Committee in May 1998. Therefore, vessels with emergency generator fuel tanks installed on or after May 14, 1998, of 500 liters (0.500 cubic meters) and greater, must have valves installed that meet this regulation. Existing installations with a capacity of 500-1,000 liters (0.500-1.000 cubic meters) are grandfathered.

Lifesaving Equipment

c. Lifesaving Equipment. The effectiveness of lifesaving equipment depends heavily on good maintenance by the crew and their use in regular drills. The lapse of time since the last survey or Safety Equipment Certificate can be a significant factor in the degree of deterioration of equipment. Apart from failure to carry equipment required by a convention or obvious defects such as holed lifeboats, the boarding team should look for signs of disuse of, or obstructions to, boat launching equipment that may include paint accumulation, seizing of pivot points, absence of greasing, condition of blocks and falls, and improper lashing or stowing of deck cargo.

Fire Safety Equipment

d. Fire Safety Equipment. For vessels in general, the poor condition of fire mains and hydrants and the possible absence of fire hoses and extinguishers in machinery or accommodation spaces points to a need for close inspection of fire safety equipment. In addition to compliance with convention requirements, the boarding team should look for evidence of a higher than normal fire risk. This might be brought about by a lack of cleanliness in the machinery space that, together with significant deficiencies of fixed or portable fire extinguishing equipment, could lead to a judgment of the vessel's being substandard. Port state control officers should not require servicing of hand portable extinguishers by servicing contractors unless obvious deterioration is present. A last servicing date of greater than 1 year, by itself, is not sufficient to require servicing

Fire Doors

(1) Fire Doors. The spread of fire could be accelerated if fire doors are not readily operable. The boarding team might inspect doors in main zone bulkheads, stairway enclosures, and boundaries of high fire risk spaces, such as main machinery rooms and galleys, for their operability and securing arrangements. Particular attention should be paid to those retained in the open position and those in main vertical zones that may have been compromised by construction.

Ventilation Systems

(2) Ventilation Systems. An additional hazard in the event of fire is the spread of smoke through ventilation systems. Spot checks might be made on dampers and smoke flaps to ascertain the standard of operability. The boarding team might also ensure that ventilation fans can be stopped from the master controls and that means are available for closing main inlets and outlets of ventilation systems.

Escape Routes

(3) Escape Routes. Attention should be given to the effectiveness of escape routes by ensuring that vital doors are not maintained locked and that alleyways and stairways are not obstructed.

Navigation Safety

e. Navigation Safety. The boarding team should examine the vessel for compliance with 33 CFR part 164. This may include testing of selected equipment coupled with an examination of the vessel's logs for required entries, charts and publications. The boarding team should ensure the person assigned responsibility for maintaining a radio watch speaks English in accordance with 33 CFR 26.07. Refer to STCW 95 NVIC 3-98 for guidance.

Cargo Vessel Safety Construction Items

f. Cargo Vessel Safety Construction Items. The general condition of the vessel may lead the boarding team to consider matters other than those concerned with safety equipment and assignment of load lines, but nevertheless associated with the safety of the vessel. This involves the effectiveness of items associated with the Cargo Ship Safety Construction Certificate, which can include hatch coamings and covers, pumping arrangements, means for shutting off air and oil supplies in the event of fire, alarm systems, and emergency power supplies.

Cargo Ship Safety Radio Operation

g. Cargo Ship Safety Radio Operation. The validity of the Cargo Ship Safety Radiotelegraphy, Safety Radiotelephony Certificate, or Cargo Ship Safety Radio Certificate may be accepted as proof of the provision and effectiveness of its associated equipment, but the boarding team should also ensure that appropriate certified personnel are carried for its operation and for listening periods. The radio log should be examined to confirm that mandatory safety radio watches are being maintained.

Equipment in Excess of Convention or Flag State Requirements

h. Equipment in Excess of Convention or Flag State Requirements. Equipment on board that is expected to be relied on in situations affecting safety or pollution prevention must be in operating condition. If such equipment is inoperative and is in excess of the equipment required by an appropriate convention and/or the flag state, it should be repaired, removed or, if removal is not practicable, clearly marked as inoperative and secured.

Garbage

i. Garbage. The boarding team may determine if all operational requirements of Annex V of MARPOL 73/78 have been met. The boarding team may determine if the reception facilities have been used and note any alleged inadequacy of such facilities.

Manuals and Instructions

j. Manuals and Instructions. The boarding team must determine if appropriate crewmembers understand the information given in manuals and instructions relevant to the safe condition and operation of the vessel and its equipment. They must also ensure that they are aware of requirements for maintenance, testing, training drills, and required logbook entries.

ISM Code

k. ISM Code. Guidance for enforcement of the ISM Code is provided in NVIC 4-98. G-MOC Policy Letter 1-99 dated December 15, 1998 has been incorporated below in order to provide additional guidance.

(1) *What are examples of a major non-conformity under the ISM Code?* The definition of a major non-conformity (IMO Resolution A.788 (19) implementation guidelines) is, “an identifiable deviation which poses a serious threat to personnel or ship safety, or a serious risk to the environment and requires an immediate corrective action.” For example, an inoperable fire pump that is repaired prior to departure, is usually not grounds for the invalidation of the SMC. However, this deficiency may lead to a major non-conformity if it is a chronic situation, indicating that an SMS has not been properly implemented. Since it may take several boardings to identify a poor SMS in this fashion, it is critical that PSCO’s review the vessel’s previous boarding results in order to track repeated deficiencies.

In addition, the lack of effective and systematic implementation of a requirement of the ISM Code is also considered a major non-conformity. Evidence should indicate that the basic component(s) in question are completely missing (e.g., no SMS documentation on board, no training program in place). This kind of a major non-conformity typically takes a longer period of time to correct. The identification of a major non-conformity by the PSCO is sufficient grounds for the COTP to question the validity of the SMC.

NOTE: A vessel is considered to be ISM compliant if all major non-conformities are cleared prior to departure. The vessel will be targeted as a Priority 1 boarding at future U.S. ports if a major non-conformity remains outstanding after the vessel's release from detention.

(2) *Who can the flag State call in to perform these external audits*? The flag State can call in any RO that they have authorized to act on their behalf.

(3) *What does a COTP do if you disagree with the Recognized Organization's (RO) findings*? If the COTP disagrees with the RO's determination that a vessel's SMS is in compliance with the ISM Code, a COTP Order shall be issued for the vessel to depart the port (after all of the serious materiel deficiencies have been corrected). A VPI notice shall also be entered into MSIS as per NVIC 4-98, and the vessel will be denied entry into all U.S. ports until the vessel can provide adequate proof of compliance with the ISM Code. In other words, if the unit believes that a vessel has a major ISM Code non-conformity, and the RO does not issue a major non-conformity to the vessel, the vessel shall be treated as if a major non-conformity were issued.

(4) *Should a representative from the unit accompany the auditor during the external audit?* If resources permit, an ISM trained representative from the unit should accompany the auditor. This will be left to the discretion of the COTP.

(5) *How long should a vessel be denied entry to U.S. ports after a major non-conformity has been issued by the RO, or identified by the COTP?* Vessels may only be denied entry into U.S. ports until they can prove compliance with the ISM Code (correction of the major non-conformity). Sufficient proof of compliance will be left to the discretion of the attending COTP. All vessels that are denied entry into U.S. ports for non-compliance with the ISM Code are immediately reported to the other international PSC regimes by G-MOC.

(6) *Should the OCMI/COTP issue requirements for vessels to correct non-conformities discovered during the expanded examination of the SMS?* No. Notes may be entered into MSIS in order to track these deficiencies. Appropriate corrective action can then be verified during future boardings. Corrective action deadlines for non-conformities are set by the company, not by the port State.

3. Items to be Examined or Tested

In general, the following items will be examined or tested by the Coast Guard marine inspector(s) as part of the annual examination:
a. Testing of the emergency generator.
b. Examination of the emergency lighting.
c. Operation of the main and emergency fire pump.
d. Testing of the fixed deck foam system (oil tankers only). Testing medium should be water only, not foam.
e. Testing of the fixed fire detection system.
f. Operation of the bilge pumps.
g. Testing of the watertight doors.
h. Lowering of one lifeboat (freight and tanker) or all lifeboats (passenger vessels).
i. Testing of remote stops for boilers, ventilation and fuel pumps.
j. Testing of the steering gear.
k. Testing of the emergency power source to the radio installations.
l. Testing of the oil water separator and bilge monitor.

4. Operational Tests

The boarding team should not require any operational tests or impose physical demands that, in the judgment of the master, could jeopardize the safety of the vessel, crew, passengers, boarding team, or cargo (i.e. do not call a fire drill during cargo operations). The boarding team should ensure, as far as possible, that there is no interference with normal operations, such as loading and unloading of cargo and ballasting, which is carried out under the responsibility of the master. The boarding team should not require demonstration of operational aspects that would unnecessarily delay vessels. However, when the boarding team has established "clear grounds" during an examination, the following on board operational procedures may be checked.

Muster List

a. Muster List. The boarding team may determine if the crewmembers are aware of their duties as indicated in the muster list.

Communication

b. Communication. The boarding team may determine if the key crewmembers are able to communicate with each other, and with passengers as appropriate, in such a way that the safe operation of the vessel is not impaired, especially in emergency situations.

Fire and Abandon Ship Drills

c. Fire and Abandon Ship Drills. The boarding team witnessing a fire and abandon ship drill should ensure that the crew is familiar with its duties during such procedures and the proper use of the vessel's installations and equipment.

Damage Control Plan

d. Damage Control Plan. The boarding team may determine if a damage control plan is provided on a passenger vessel and whether the crew is familiar with its duties and the proper use of the vessel's installations and equipment for damage control purposes.

Fire Control Plan

e. Fire Control Plan. The boarding team may determine if a fire control plan or booklet is provided and whether the crew is familiar with the information given in the fire control plan or booklet.

Bridge Operation

f. Bridge Operation. The boarding team must determine if officers in charge of a navigational watch are familiar with bridge control and navigational equipment, changing the steering mode from automatic to manual and vice versa, and the vessel's maneuvering characteristics.

Cargo Operation

g. Cargo Operation. The boarding team may determine if personnel assigned specific duties related to the cargo and cargo equipment are familiar with those duties, the dangers posed by the cargo, and the measures to be taken in such a context.

Loading, Unloading, and Cleaning Procedures for Cargo Spaces of Tankers

(1) Loading, Unloading, and Cleaning Procedures for Cargo Spaces of Tankers. The boarding team may determine if all operational requirements of Annexes I or II of MARPOL 73/78 have been met, taking into account the type of tanker and the type of cargo carried, including the inspection of the oil record book and/or cargo record book. The boarding team may determine if the reception facilities have been used and note any alleged inadequacy of such facilities.

Dangerous Goods and Harmful Substances in Packaged Form

(2) Dangerous Goods and Harmful Substances in Packaged Form. The boarding team may determine if the required shipping documents for the carriage of dangerous goods and harmful substances carried in packaged form are provided on board and whether the dangerous goods and harmful substances are properly stowed and segregated. In addition, the boarding team should ensure that the crew is familiar with the essential actions to be taken in an emergency involving such packaged cargo.

H. Reexaminations

Reexaminations are conducted to ensure a vessel has remained in compliance with appropriate laws or international conventions between the period of annual examinations. These examinations normally consist of an examination of the vessel's certificates, licenses, and documents followed by a general examination, i.e. "walk through" of the vessel, as outlined in section MSM II-D1.G.2. Unlike an annual examination, the testing of specific equipment and the witnessing of operational procedures and emergency drills by the vessel's crew are not a standard part of the reexamination.

1. Fire and Abandon Ship Drills

In the case of foreign passenger vessel reexaminations, the reexamination shall include the witnessing of fire and abandon ship drills to ensure that the vessel's crew can adequately ensure the safety of the passengers in an emergency.

I. Expanded Examinations

If any examination reveals "clear grounds" for believing that the condition of a vessel or its equipment does not correspond substantially with the particulars of its certificates, the boarding team should expand the examination to further explore the scope and depth of these indications. Expanded examinations should focus on those areas where "clear grounds" have been established and should not include other areas or systems unless the general impressions or observations of the boarding team support such examination.

1. List of Deficiencies

To assist the boarding team, a list of deficiencies that establish "clear grounds" to expand an examination has been developed. The deficiencies, grouped under the relevant conventions and/or codes, are considered of such a serious nature that they may warrant the detention of the vessel involved. This list is not considered exhaustive but is intended to provide an explanation of relevant items. **(References in brackets.)**

Deficiencies		
a.	**General**	
	(1)	Absent or invalid certificates required under applicable conventions.
b.	**Areas Under SOLAS**	
	(1)	Failure of proper operation of propulsion and other essential machinery as well as electrical installations.
	(2)	Insufficient cleanliness of engine room; excess amount of oil-water mixture in the bilges; insulation of piping including exhaust pipes in engine room contaminated by oil; and improper operation of bilge pumping arrangements.
	(3)	Failure of the proper operation of emergency generator, lighting, batteries and switches.
	(4)	Failure of proper operation of the main or auxiliary steering gear.
	(5)	Absence, insufficient capacity, or serious deterioration of personal lifesaving appliances, survival craft and launching arrangements.
	(6)	Absence, noncompliance, or substantial deterioration to the extent that it can not comply with its intended use of fire detection system, fire alarms, fire fighting equipment, fixed fire extinguishing installation, ventilation valves, fire dampers and quick- closing devices.
	(7)	Absence, substantial deterioration, or failure of proper operation of the cargo deck area fire protection on tankers.
	(8)	Absence, noncompliance, or serious deterioration of lights, shapes, or sound signals.
	(9)	Absence, or failure of the proper operation, of the radio equipment for distress and safety communication.
	(10)	Absence, or failure of the proper operation of navigation equipment, taking the relevant provisions of SOLAS Chapter V/12 into account.
	(11)	Absence of navigation charts and/or all other relevant nautical publications necessary for the intended voyage.
	(12)	Absence of non-sparking exhaust ventilation for cargo pump rooms (59.3.1)

(13) Serious noncompliance with procedures stipulated under the Certificated Safety Management System on vessels required to comply with SOLAS Chapter IX. (See NVIC 4-98 on ISM Code Enforcement)

Deficiencies (continued)		
c.	**Areas under the IBC Code**	
	(1)	Transport of a substance not mentioned in the Certificate of Fitness or missing cargo information (16.2).
	(2)	Missing or damaged high-pressure safety devices (16.2).
	(3)	Electrical installations not intrinsically safe or not corresponding to the code requirements (10.2.2).
	(4)	Sources of ignition in hazardous locations referred to in 10.2 (11.3.15).
	(5)	Contravention of special requirements (15).
	(6)	Exceeding of maximum allowable cargo quantity per tank (16.1).
	(7)	Insufficient heat protection for sensitive products (16.6).
d.	**Areas under the IGC Code**	
	(1)	Transport of a substance not mentioned in the Certificate of Fitness or missing cargo information (18.1).
	(2)	Missing closing devices for accommodations or service spaces (3.2.6).
	(3)	Bulkhead not gastight (3.3.2).
	(4)	Defective air locks (3.6).
	(5)	Missing or defective quick closing valves (5.6).
	(6)	Missing or defective safety valves (8.2).
	(7)	Electrical installations not intrinsically safe or not corresponding to the code requirements (10.2.4).
	(8)	Ventilators in cargo area not operable (13.4.1).
	(9)	Pressure alarms for cargo tanks not operable (13.4.1).
	(10)	Gas detection plant and/or toxic gas detection plant defective (13.6).
	(11)	Transport of substances to be inhibited without valid inhibitor certificate (17/19).
e.	**Areas Under ILLC**	
	(1)	Significant areas of damage or corrosion, or pitting of plating and associated stiffening, in decks and hull affecting seaworthiness or strength to take local loads. This is omitted if authorized temporary repairs for a voyage to a port for permanent repairs have been carried out.
	(2)	A recognized case of insufficient stability.
	(3)	The absence of sufficient and reliable information in an approved form, which by rapid and simple means, enables the master to arrange for the loading and ballasting of the vessel in such a way that a safe margin of stability is maintained at all stages and at varying conditions of the voyage, and that the creation of any unacceptable stresses in the vessel's structure is avoided.
	(4)	Absence, substantial deterioration, or defective closing devices, hatch closing arrangements and watertight/weathertight doors.
	(5)	Overloading.
	(6)	Absent or improper draft and/or Load Line marks.

Deficiencies (continued)		
f.	**Areas Under MARPOL Annex I**	
	(1)	Absence, serious deterioration, or failure of proper operation of the oily-water filtering equipment, the oil discharge monitoring and control system, or the 15-ppm alarm arrangements.
	(2)	Remaining capacity of slop and/or sludge tank insufficient for the intended voyage.
	(3)	Oil record book not available (20(5)).
	(4)	Unauthorized discharge bypass fitted.
g.	**Areas under MARPOL Annex II**	
	(1)	Absence of Procedures & Arrangements Manual.
	(2)	Cargo is not categorized (3(4)).
	(3)	No cargo record book available (9(6)).
	(4)	Transport of oil-like substances without satisfying the requirements or without an appropriately amended certificate (14).
	(5)	Unauthorized discharge bypass fitted.
h.	**Areas Under STCW**	
	(1)	Inadequate certificates or endorsements
	(2)	Rest periods insufficient
	(3)	English standard deficient
	(4)	Lack of basic safety training
	(5)	Lack of vessel familiarization
i.	**Areas Under ILO 147**	
	(1)	Insufficient food for voyage to next port.
	(2)	Insufficient potable water for voyage to next port.
	(3)	Excessively unsanitary conditions on board.
	(4)	No heating in accommodation of a vessel operating in areas where temperatures may be excessively low.
	(5)	Excessive garbage, blockage by equipment or cargo, or otherwise unsafe conditions in passageways/accommodations.

J. EXAMINATION BOOKS

Annual examinations and reexaminations shall be conducted according to the guidance in the appropriate examination book. These books may be downloaded in their entirety from the Training Center website at http://rtcs10net.rtc.uscg.mil/rtcweb/mschools/mii/cg840.html.

CHAPTER 2: PROCEDURES APPLICABLE TO EXERCISING CONTROL OVER FOREIGN VESSELS UNDER U.S. JURISDICTION

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CHAPTER 2: PROCEDURES APPLICABLE TO EXERCISING CONTROL OVER FOREIGN VESSELS UNDER U.S. JURISDICTION

A. INTRODUCTION

Approximately 29% of the foreign vessel boardings carried out by the Coast Guard result in deficiencies being discovered. Considering the seriousness of the deficiencies, the Officer-in-Charge Marine Inspection (OCMI) or Captain of the Port (COTP) must determine the appropriate control action to impose on these vessels to ensure the safety of the vessel, the port and the environment. The degree of control imposed, as well as the authority used to exercise control, must be consistent with the nature of the deficiencies.

B. DEGREES OF CONTROL

1. Requiring Corrective Measures Within a Specified Period

When deficiencies pose no unreasonable threat to the environment and do not adversely affect the vessel's seaworthiness, the vessel should not be detained other than as necessary to ensure the posting of a LOU/surety bond in accordance with Volume I, Chapter 4.D.2.c.(3) of this manual, when appropriate. The deficiencies shall be documented in the Port Safety Discrepancy Report (PSDR) of the Marine Safety Information System (MSIS). For passenger vessel examinations and reexaminations, and chemical vessel Letter of Compliance (LOC) biennial examinations which are not normally documented under the Port Safety Activity Report (PSAR) product set, the Marine Inspection Deficiency Report (MIDR) shall be used. Each deficiency shall be assigned a compliance date appropriate to the nature of the deficiency. The length of time allowed to effect the repairs is left to the discretion of the OCMI/COTP. In making the determination, the OCMI/COTP should consider the nature and severity of the deficiency; the amount of time normally needed to repair such a deficiency; the availability of repair facilities, drydocks or service facilities; and the vessel's itinerary. In most cases, a one-month compliance date will be appropriate. If compliance is required prior to the next U.S. port entry, the compliance date entered into MSIS should be the day after the vessel departs the port for sea. This will automatically classify the vessel as having an outstanding deficiency and identify the vessel for a priority II boarding at the next U.S. port. Some repairs may not be feasible until the next scheduled yard period or drydocking. In such cases, estimate the latest date by which a vessel must be drydocked and enter that date as the compliance date. The comments section should indicate corrective measures are to be completed at the next drydocking. Civil penalty action may be initiated in accordance with Volume I, Chapter 4.D.2.c. of this manual for violations of U.S. regulations. Examples of deficiencies that might be required to be corrected within a specified time period include, but are not limited to, the following:

a. Minor leakage or small holes in firemain that do not affect ability to maintain adequate pressure to fight fires;

b. Hull, tank, structure or piping damage or wastage that has been temporarily repaired to the satisfaction of the classification society and OCMI/COTP;

c. Grab rails on lifeboat that are loose or missing;

d. Lifeboat seats with minor damage or decay but still capable of supporting weight of passengers; and

e. Missing weak links on liferafts of a cargo or tank vessel.

2. Requiring Corrective Measures Prior to Return to U.S.

Deficiencies related to U.S. laws or regulations that are not requirements under international conventions and that pose no immediate threat to the environment or adversely affect the vessel's seaworthiness should not result in the detention of a vessel other than as necessary to ensure the posting of a LOU/surety bond in accordance with Volume I, Chapter 4.D.2.c.(3) of this manual, when appropriate. In such cases, corrective measures may be required to be accomplished prior to the vessel's return to a U.S. port. The deficiencies shall be entered into the PSDR product set of MSIS with a compliance date as the day following the vessel's departure. The comments section should indicate corrective measures are to be completed prior to return to the United States. Civil penalty action may be initiated in accordance with Volume I, Chapter 4.D.2.c. of this manual for violations of U.S. regulations. Examples of deficiencies that might require correction prior to return to the U.S. include, but are not limited to, the following:

a. Charts or nautical publications not currently corrected;

b. Electrical fixtures in paint locker not appropriately certified for safe usage in hazardous location (operational control (i.e., disconnected power source or removal of flammables from space);

c. Portable hoses have not been tested but appear in good condition;

d. Nameplate data on cargo tanks of LOC not available; and

e. Actual location of safety equipment deviates from the vessel safety plan.

3. Requiring Corrective Measures Prior to Cargo, Bunkering or Lightering Operations

U.S. regulations pertaining to cargo handling and pollution prevention generally apply to foreign vessels operating in U.S. waters. When deficiencies related to these U.S. regulations adversely affect the safety of cargo operations, but do not make the vessel unfit to proceed to sea, cargo transfer operations may be prohibited or terminated until corrective measures are accomplished. Provided the vessel is not restricted from departing port or required to effect corrective measures prior to departure, this is not to be considered a detention. This action should be taken under the Ports and Waterways Safety Act and requires the issuance of a COTP Order. Examples of deficiencies that might require termination or delay of cargo operations include, but are not limited to, the following:

a. Oil transfer procedures incomplete;

b. No approved Vessel Response Plan (VRP) aboard;

c. No Certificate of Financial Responsibility (COFR) aboard;

d. LNG/LPG minor gas detection deficiencies (operational control: use portable gas detectors if feasible);

e. LNG/LPG air locks malfunctioning (operational control: ensure proper ventilation of the protected space and closely monitor traffic through the space);

f. High/low level alarms inoperative (operational control: ensure careful monitoring of liquid level); and

g. Information on properties and hazards of cargoes not on board (operational control: brief crew and terminal personnel on cargo hazards).

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4. Requiring Corrective Measures Prior to Embarking Passengers

Title 46 U.S.C 3505 prohibits a foreign vessel from departing a U.S. port with passengers who are embarked at that port if the vessel does not comply with the International Convention for the Safety of Life at Sea (SOLAS). This does not preclude the OCMI/COTP from detaining a passenger vessel if it is unfit to proceed to sea or an unreasonable threat to the environment. However, in many cases passenger vessel deficiencies, although serious, may not make the vessel unseaworthy or a risk to the environment. Detention may not be warranted, but concern for the safety of U.S. passengers dictates that the vessel not embark passengers until the deficiencies are corrected. In these cases it is appropriate to prohibit the vessel from embarking passengers in the U.S. until corrective measures are accomplished. Examples of deficiencies that might require correction prior to embarking passengers include, but are not limited to, the following:

a. Mustering instructions not posted in all passenger state rooms;

b. Personal flotation devises not stowed in an accessible location in each stateroom;

c. Inadequate marking of passenger escape routes; and

d. Malfunctioning intercom or alarm systems.

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5. Requiring Corrective Measures Prior to Entry

In some cases, deficiencies may be discovered prior to a vessel's entry into port which present such a grave risk to the port or the environment that the OCMI/COTP may wish to prevent the vessel from entering port until the deficiencies are corrected. Within the territorial sea, a COTP Order may be used to prevent entry. However, under certain circumstances, a vessel may claim "force majeure" and enter port anyway. The OCMI/COTP must carefully balance the risks to the port against the risks to the crew and ship. Corrective measures may be difficult or impossible to accomplish at sea. Consideration should be given to identifying a safe haven or anchorage into which such a vessel might be permitted to enter at minimal risk to the port or environment. In extreme cases, the OCMI/COTP may wish to consider intervening before the vessel enters U.S. territorial waters. In such cases the OCMI/COTP shall refer to COMDTINST 16451.5 "Policy Guidance for Intervention in Ship-Related Marine Pollution Incidents on the High Seas and on the Navigable Waters of the U.S.". Examples of conditions which might warrant denying a vessel entry into port include:

a. Incompatible cargoes stowed in adjacent tanks;

b. Cargoes being carried which are not authorized by the LOC;

c. Cargo leaks from tanks or piping systems;

d. LNG/LPG Gas detection system inoperative; and

e. Vessel carrying dangerous cargoes without LOC with Subchapter O Endorsement/International Maritime Organization (IMO) Certificate of Fitness (COF) or with expired documents.

f. Lack of ISM Certification

g. Lack of COFR

C. AUTHORITY USED FOR CONTROL ACTION

Regardless of whether deficiencies must be repaired before commencing cargo operations, departing port, or returning to the U.S., control actions must be based on the control authority provided under domestic laws or international conventions. Compliance with standards other than those implemented under law, regulation or convention cannot be mandated. It is incumbent upon the OCMI/COTP and the boarding team that they thoroughly research requirements to ensure that any control action taken is authorized under an applicable law, regulation or convention. In particular, be careful to ensure the applicability of requirements on older vessels that are often "grandfathered" or exempted from standards established since they were built. The enforcement options available to the COTP/OCMI are described below.

1. Enforcement of U.S. Laws and Regulations

Letters of Deviation

a. Letters of Deviation. Under 33 CFR part 164.55, the COTP may authorize, upon written application, a deviation from any rule in 33 CFR part 164. However, the risks imposed by equipment failures reported in accordance with 33 CFR part 164.53, and casualties reported in accordance with 46 CFR part 4.05, should be considered before issuing a letter of deviation. Equipment failures or casualties may be indicative of other problems aboard vessel. A boarding and examination prior to issuing a letter of deviation should be considered in those cases involving high-risk vessels (i.e. Priority I or II). Issuance of a letter of deviation does not preclude the possibility of pursuing civil penalty action.

Captain of the Port (COTP) Orders

b. Captain of the Port (COTP) Orders. This enforcement option can be used to implement a variety of control options from simply controlling the vessel's movement as it departs port to detaining the vessel in port until deficiencies are corrected. This order is initiated under the authority of the Ports and Waterways Safety Act of 1972 (33 U.S.C. 1221) and implementing regulations of 33 CFR 160.113.

Controlling the Ship's Movement

(1) Controlling the Ship's Movement. Depending on the deficiencies discovered, the OCMI/COTP can use a COTP order to control or restrict the vessel's movement or operations. For example, if the deficiency relates to the vessel's navigational equipment, the COTP order may require a vessel to use an assist tug or may restrict a vessel to daylight operations. If the deficiency relates to pollution prevention equipment, the COTP order may prohibit a vessel from bunkering or lightering until corrective measures are taken. Many additional applications exist, not all of which are related the condition of a vessel. (e.g. A COTP order may be used to order a vessel to a specific anchorage to protect a port during a hurricane.)

Civil Penalty Action

c. Civil Penalty Action. In addition to control actions, the COTP/OCMI may process a civil penalty case for violations of U.S. laws or regulations. Civil penalty enforcement should be taken against those involved parties that are in the best position to bring about compliance and those who can best deter future violations. (See Volume I, Chapter 4.D.2.c. of this manual).

Letter of Warning

(1) Letter of Warning. This correspondence is appropriate for minor violations that are corrected immediately by conscientious operators. The discovery of administrative errors in dangerous cargo manifests and incorrectly sized lettering on warning signs are two obvious examples of minor violations. However, a history in MSIS of continuing violations indicates the need for more stringent enforcement actions.

Civil Penalty Adjudication

(2) Civil Penalty Adjudication. Civil penalty proceedings should be initiated for all major non-criminal violations, for repeat offenders, and any minor violations that are not corrected immediately by the responsible party. Penalty amounts are determined based on factors involved in the violation including the circumstances under which the violation occurred; seriousness of the violation; culpability of the party; prior history of similar violations, economic benefit of noncompliance to the responsible party, and the degree of success of effort by the responsible party to minimize or mitigate injury and/or risk. Civil penalties, other than more serious Federal Water Pollution Act (FWPCA) or Comprehensive Environmental Response Compensation and Liability Act (CERCLA) violations, are adjudicated by Coast Guard hearing officers under 33 CFR 1.07. See COMDTINST 16200.5 for additional information.

Letter of Undertaking/Surety Bonds

(3) Letter of Undertaking/Surety Bonds. Whenever a violation case is pursued, the boarding officer should normally require a Letter of Undertaking (LOU) or Surety Bond from the vessel owner, operator, or person in charge to assure payment of a penalty or fine.

Customs Hold

d. Customs Hold. Under the authority of 46 U.S.C. 91, vessels intending to depart the U.S. for a foreign port must obtain a clearance from the U.S. Customs Service. Under various U.S. laws, the Coast Guard is authorized to request that the Customs Service deny or withhold the required clearance when these laws are violated unless a bond or other surety is posted.

D. ENFORCEMENT OF INTERNATIONAL CONVENTIONS

The U.S. is party to the following international instruments which provide authority for port States to exercise control procedures to secure compliance with applicable convention provisions: the International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended; the International Convention on Load Lines (ICLL), 1966; the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the protocol of 1978 relating thereto (MARPOL 73/78); the International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended in 1995 (STCW 95); and the International Labor Organization Convention No. 147, (ILO 147).

1. Control Procedures

SOLAS

a. International Convention for the Safety of Life at Sea (SOLAS). SOLAS Chapter I, Regulation 19 authorizes port states to board foreign vessels to determine the validity of their SOLAS certificates. Where "clear grounds" are present which indicate that a vessel is not in compliance with applicable requirements, the port state is authorized to take such steps as may be necessary to ensure that the vessel does not sail until it can proceed to sea, or leave the port for the purpose of proceeding to a repair yard, without danger to the vessel or persons on board.

ICLL

b. International Convention on Load Lines 1966 (ICLL). ICLL Article 21(1) and (2) provides the port state with the authority to board foreign vessels to verify the validity of the vessel's certificate and to determine that the vessel is not loaded beyond its allowable limits, that the position of the load line corresponds with the certificate, and that the vessel has not been so materially altered that it is manifestly unsafe to proceed to sea without danger to human life. The port State is authorized to take control as may be necessary to ensure that the vessel does not sail until it can proceed to sea without danger to passengers or crew.

MARPOL

c. International Convention for the Prevention of Pollution from Ships (MARPOL) 73/78. Article 5(2) provides port states with the authority to inspect foreign vessels to verify the validity of the vessels' certificates. Where "clear grounds" are present which indicate that the vessel is not in compliance with the certificates, the port State is authorized to take such steps as will ensure that the vessel does not sail until it can proceed to sea without presenting unreasonable threat of harm to the marine environment.

STCW 95

d. International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 as amended in 1995 (STCW 95). Ships may be detained under STCW authority if the deficiencies pose a danger to persons, property or the environment. These deficiencies are described in STCW Reg. I/4. Regulation 1/4 will be the only cite used if a detention is

warranted.

ILO 147

e. International Labor Organization (ILO) Convention No. 147. Article 4 of ILO 147 prescribes that port states may take measures necessary to rectify any conditions on board which are clearly hazardous to safety or health. The U.S. has not enacted special legislation executing this treaty because existing U.S. shipping and navigation laws substantially encompass the treaty's provisions. The Ports and Waterways Safety Act (PWSA), 33 USC 1221 et. seq., authorizes the (COTP) to detain a vessel if it is not in compliance with an applicable treaty, provided the vessel poses a serious threat to the port. The general goals of ILO 147 may be used as a reference to measure the threat to the port. Additional guidance may be found in COMDTINST 16711.12.

E. DETENTION CRITERIA

1. Casualty or Weather Damage

Vessels suffering casualty or weather damage within or enroute to ports in the United States, and whose owners have demonstrated an intent to initiate corrective measures voluntarily while in port, should not normally be subjected to intervention, leading to a detention. Operational controls necessary to protect life, the port, or the environment may be imposed through a COTP order (i.e. to require a tug assist, daylight transit, containment boom, etc.). However, should evidence indicate an intent to depart port without satisfactory repair, a detention should be initiated.

2. Safe Manning Document

SOLAS Chapter V, Regulation 13 requires all ships of 500 gross tons and more on international voyages to be issued a safe manning document.

Detention of Vessels

a. Detention of Vessels. A vessel should be detained under SOLAS, Chapter I, Regulation 19, or under the authority of the Ports and Waterways Safety Act, Section 1223, if:

(1) there is no safe manning document available;

(2) the vessel is not manned in accordance with the document;

(3) the document does not identify the vessel;

(4) the document lacks a table showing the numbers and grades of personnel required to be carried, together with any special conditions or limitations based on particulars of the vessel or the nature of the service upon which it is engaged; or

(5) the document lacks an issue date, signature or the flag State's seal

Inadequate Manning Specified by Safe Manning Document

b. Inadequate Manning Specified by Safe Manning Document. In the event the boarding team considers the crew complement stated on the safe manning document to be manifestly unsafe, the master and the consulate of the flag State should be notified and an acceptable manning complement should be provided before the vessel is permitted to depart. Annex 2 of IMO Resolution A.481(XII) provides guidance for assessing the adequacy of manning on a foreign vessel. As a general matter, manning may be considered to be manifestly unsafe when any one of the following conditions exists:

(1) The vessel is over 1000 gross tons, has only one mate, has no designated chief mate, and there is a clear indication that the master is routinely expected to be a member of the watch rotation. Under these circumstances, the master is clearly overburdened with duties relating to watchkeeping, cargo transfer, dealing with boardings while the vessel is in port, administration of company management tasks, and the customary duties of the captain.

NOTE: Internationally, it is not unusual for the master to stand a watch on a two-watch rotation on vessels of limited size (<1000 gross tons).

(2) There is only one engineer on board and the vessel's propulsion system is of a complexity which clearly requires a licensed engineer to be on call at all times to respond to alarms in addition to managing maintenance tasks to prevent vital system failures.

(3) The overall condition of the vessel, its navigational equipment or its engineering systems is so poor, or the crew is in such a state of fatigue, so as to suggest that the available crew is obviously inadequate to perform the tasks necessary to prevent vital system failures.

SOLAS: Non-Signatory Flagged Vessels or SOLAS Inapplicable Vessels

c. Vessels of Flag Administrations not Party to SOLAS or to which SOLAS does not Apply. In the event a vessel is flying the flag of an Administration which is not a party to SOLAS, or the vessel is not subject to the SOLAS requirement for having a safe manning document, the boarding team should initially apply U.S. manning requirements for vessels of similar size and service. As stated above, Annex 2 of IMO Resolution A.481(XII) contains general guidance for assessing the adequacy of manning on foreign vessels and makes special allowances for vessels of limited size (<1000 gross tons). The following scale may be used as a starting point, but due consideration should be given to the fact that U.S. requirements vary widely for small vessels on short voyages or engaged in limited operations (such as offshore supply vessels and towing vessels), and the engineering component depends on the level of automation in the systems and machinery on board.

- One licensed master
- Two licensed mates*
- One licensed engineer
- Two able seamen (or ratings qualified as members of the navigational watch under STCW)
- One deck maintenance/ordinary seaman
- Radio officer/radio operator (if the vessel is operating more than 150 miles from shore)

NOTE:

(a) 46 U.S.C. 8301 requires a master and three mates on vessels of 1000 gross tons and more; and a master and two mates for U.S. vessels 200 to 1000 gross tons, with an exception for OSV's on voyages up to 600 miles;

(b) regulations in 46 CFR 15 allow for two operators on most uninspected towing vessels under 200 gross tons;

(c) tonnage as determined under U.S. regulations is normally lower than tonnage determined under the international tonnage measurement system; and

(d) worldwide, it is not unusual for small vessels with all-round visibility from the wheel house and bridge control of propulsion systems to operate with the officer of the navigational watch acting as the sole lookout on a two-watch system, unless the night vision of the officer is impaired, there is congested traffic, or the weather, visibility or other conditions indicate the need for a separate lookout.

3. International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, (STCW 95)

STCW95 standardizes mariner requirements worldwide. These standards are now clearly documented and no longer left to the discretion of various administrations. A major change in these requirements is in the forms of new competency certificates. The new STCW certificates (1995 Endorsements) may be in any one of 3 forms (see NVIC 3-98). All information relating to the capacity or capacities in which the holder is entitled to serve, in accordance with the applicable safe manning requirements of the Administration, as well as any limitations will be identified. Ships may be detained under STCW authority if the uncorrected deficiencies pose a danger to persons, property or the environment.

General Examination

a. General Examination. During all foreign vessel examinations, PSCOs will compare the crew certificates and endorsements with the requirements of the Safe Manning Document, check posted watch arrangements for appropriate rest periods, and examine the specific new crew-member familiarization procedures.

Reasons to Expand a General Examination

b. Reasons to Expand a General Examination. If, during the general examination, the PSCO encounters a situation that establishes clear grounds that watchkeeping standards are not being maintained, the examination will be expanded. Situations encountered during a general examination that establish clear grounds are those that prevent the PSCO from completing a general examination and include (for example): the inability of crewmember(s) to perform their assigned duties during abandon ship or fire fighting drills; the inability of crewmember(s) to communicate with the PSCO in English (when required by STCW) to the extent that it prevents the PSCO from completing the general examination and the ship is otherwise being operated in such a manner as to pose a danger to persons, property or the environment. Items which may be deemed to pose a danger to persons, property or the environment are outlined in NVIC 3-98.

Reporting Obligations

c. Reporting Obligations. The COTP shall use the reporting requirements described in section E of this chapter when vessels are detained under STCW authority. When citing deficiencies with the requirements of the STCW Convention, field units shall cite the regulation 1/4 in the Convention, not the section of the STCW Code.

4. Shipboard Oil Pollution Emergency Plan (SOPEP)

a. Since 4 July 1995, all tank vessels 150 gross tons and above, and all other ships over 400 gross tons, shall have an approved SOPEP on board in accordance with MARPOL Annex I, Regulation 26. Any vessel not meeting the criteria, shall be dealt in the manner below.

NOTE: An approved plan shall be required within 90 days and the vessel's master should be warned in writing that failure to comply will result in denial of entry, detention, and/or suspension of operations. The OCMI/COTP shall document the absence of an approved SOPEP with a Vessel of Particular Interest (VPI) notice in MSIS.

5. Vessel Response Plans (VRP)

Original VRP's that were submitted and approved in accordance with NVIC 8-92 and the interim final rule began to expire in 1998. 33 CFR 155.1070 requires VRP's to be submitted for re-approval six months before their expiration date, but it's expected that many vessel operators will not meet this deadline. In order to prevent unnecessary delays of oil transportation in U.S. waters, to allow sufficient time for Commandant (G-MOR) to review a surge of re-submitted VRP's, and to ensure that vessels have identified resources necessary to respond to oil spills, the following enforcement policy shall be followed for a foreign vessel discovered in port with an expired VRP:

a. The OCMI/COTP shall suspend cargo operations;

b. The vessel operator must submit written certification that necessary private response resources are contracted for as required by 33 CFR 1050, 1052, 1230 or 2230, as appropriate; and

c. The vessel operator will be prohibited from handling, storing or transporting oil on the navigable waters of the U.S., or transferring oil in any port or place subject to U.S. jurisdiction without an approved plan within 90 days from the time of discovery with an expired VRP in U.S. waters.

NOTE: This policy does not apply to vessels without a previously approved VRP. Vessels without a previously approved VRP shall continue to be prohibited from cargo operations without interim authorization or a one-time waiver. OCMI/COTP's shall document the absence of an approved VRP with an MSIS VPI notice, and shall not rely solely on VRP dates indicated on the vessel's MSIS VFLD.

6. Assessments

When deciding whether the deficiencies found are sufficient to merit detention, the OCMI/COTP should assess several elements. If the results of any of these assessments is negative, taking into account the deficiencies found, the vessel should be strongly considered for detention. These elements include:

a. The vessel has relevant valid documentation;
b. The vessel has the crew required in the Safe Manning Document;
c. The vessel can navigate safely;
d. The vessel can safely handle, carry, and monitor the cargo;
e. The vessel can operate the engine room safely;
f. The vessel can maintain the proper propulsion and steering;
g. Fires can be fought effectively in any part of the vessel;
h. The vessel can be abandoned speedily and safely and rescue can be effected;

i. The vessel can prevent pollution;

j. The vessel can maintain adequate stability;

k. The vessel can maintain adequate watertight integrity; and

l. The vessel can communicate effectively in distress situations.

7. Requiring Corrective Measures Prior to Departure

When deficiencies are discovered which render a vessel unfit to proceed to sea or an unreasonable risk to the environment, the vessel should be detained, if the vessel is not already initiating corrective action. A vessel may be detained under the authority of the Ports and Waterways Safety Act through a COTP order or it may be detained under the control provisions of the applicable international conventions. The various control provisions of the applicable international conventions are listed in Section D of this chapter. The authority used to detain a vessel should be consistent with the nature of the deficiencies, e.g. if the vessel is considered to be substandard then it should be detained under an International Convention. If the vessel is not or is considered substandard only under U.S. laws, then issue a COTP Order. Examples of deficiencies that might require correction prior to departure include, but are not limited to, the following:

a. Excessive wastage, corrosion, pitting, holes or damage to the hull, cargo hatches, tanks, cargo piping, firemain or other vital systems;

b. Inoperable emergency firepump or emergency generator; (vessels with emergency firepumps that can't draw suction because of a light draft should not be detained)

c. Inability to lower lifeboats;

d. Lifeboat motors will not start;

e. Invalid Safety Construction Certificate, Safety Equipment Certificate, Passenger Ship Safety Certificate, Load Line Certificate or other certificates required under International Conventions; and expanded exam reveals gross deficiencies

f. Crew incompetent to carry out duties (e.g. Fire or boat drill, cargo transfer, stability calculations etc.).

g. Serious steering deficiencies

h. Safe manning deficiencies (See NVIC 3-98)

8. Ensuring Safety

The protection of passengers, crew, property and the environment is the ultimate goal of a Port State Control examination. Control must be exercised with reason. A vessel should not be detained unless it is unfit to proceed to sea or poses an unreasonable risk to the environment. All possible efforts shall be made to avoid unduly detaining or delaying a vessel. Provided that a vessel is reasonably safe, it is not necessary that every deficiency be corrected prior to departure. In some cases, temporary repairs or alternative equipment or arrangements may be sufficient to allow a vessel to proceed on its voyage until convention requirements can be fully met. If deficiencies can be "corrected on the spot" or prior to the boarding officers' departure, then a detention should not be initiated.

F. REPORTING OBLIGATIONS

1. Detention Report

All interventions leading to detentions shall be documented on the Detention Report form (Annex A to this chapter). The report will be sent as an attachment to Commandant (MOC) via the electronic mail system in accordance with Appendix A. A copy of the message and its attachment will be sent to the reporting unit's district office by entering the district electronic mail address in the "copy" block of the message header. The electronic mail message will be sent in return receipt format. The individual that originates the message is responsible to confirm its delivery. The delivery of the report to the Commandant must be completed no later than 1630 on the business day following the intervention action. Deficiencies should clearly state what problems exist and the scope or seriousness of the deficiencies (e.g. "Firemain, multiple holes, wastage - unable to maintain adequate pressure," provides a much better description of the problem than to simply state "prove proper operation of firemain" or "Emergency generator will not start" as opposed to "Prove operation of emergency generator"). Applicable cites shall be entered for all deficiencies listed on the Detention Report (e.g. "SOLAS 74 II-2/4.1 Firemain, multiple holes, wastage - unable to maintain adequate pressure"). The detention reports will be reviewed and/or released by the command prior to being forwarded to the Commandant. Only those significant deficiencies which are the cause of the detention should be listed on the Detention Report. Minor deficiencies and deficiencies that do not require correction prior to departure should not be listed on this form (e.g. do not list items like "update publications" or "install weak link" on the Detention Report). Minor detention deficiencies should be documented in MSIS and included on a separate worklist provided to the vessel's master.

a. Follow-up Reports. The Detention Report may be used to update or correct information submitted on the initial report. The E-mail subject line forwarding Detention Reports should identify whether the Detention Report is an initial report or an update to a previous report.

b. Post-Detention Report. Post-Detention Reports will be submitted via the electronic mail system. A copy of the message and its attachment will be sent to the reporting unit's district office by entering the district electronic mail address in the "copy" block of the message header. The subject of the message will be: POST REPORT OF: [VESSEL NAME]. The Post Detention Report will be completed in accordance with Annex A to this chapter.

2. Flag State Notification

Whenever a foreign vessel is denied entry to a port or offshore terminal, or is detained, the command must notify the flag State as soon as possible at the Point of Contact provided on the Port State Control Website. If notification is verbal, it should be subsequently confirmed in writing. This can be done either by letter or by forwarding a copy of the detention report to the authorized representative.

3. Classification Society Notification

The local office of the classification societies or authorized organizations that issued the relevant certificates on behalf of the flag state must be notified of any detentions affecting their vessels. A visit by the local surveyor/class representative can expedite the deficiency correction process. In any case of Port State Control action, the unit must notify the classification society's head office. A list of points of contact for class societies is provided on the Port State Control Website. Classification society involvement in the correction of deficiencies related to equipment, hull or structure is to be encouraged. To ensure accountability, the OCMI/COTP should advise G-MOC of unsatisfactory classification society performance rather than corresponding directly with the classification society. G-MOC will officially notify the classification society of any detentions determined upon review to be the result of deficiencies for which the classification society should be held accountable.

4. Master's Notification

The command should ensure that the master of the vessel is given a copy of the Detention Report and a clear work list of actions that must be taken to correct all deficiencies. The master should be made aware that those items listed on the Detention Report must be addressed before the vessel will be permitted to leave port. The deficiencies should be developed in conjunction with the classification society when and where possible.

5. Owner's Notification

Upon receipt of notification of a Detention Report, G-MOC will send written notification to the owner, operator and/or managing operator of the vessel.

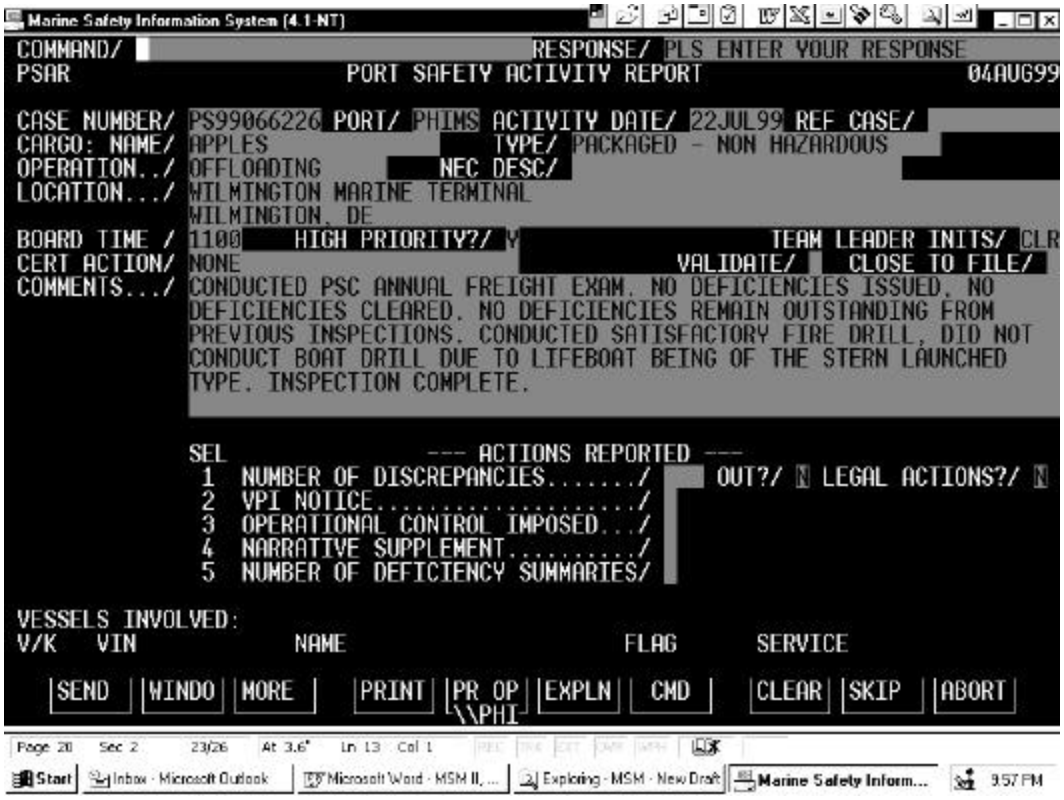
6. International Maritime Organization (IMO) Notification

When an intervention leads to a detention, G-MOC will submit a report to the International Maritime Organization to fulfill the reporting requirements in Chapter I, Regulation 19, of the International Convention for the Safety of Life at Sea, Article XI of the International Convention for the Prevention of Pollution from Ships, Article 21 of the International Convention on Load Lines 1966, or Article X (3) of the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers, 1978, as appropriate.

G. MARINE SAFETY INFORMATION SYSTEM (MSIS)

All control actions shall be documented in MSIS by completing the OPERATIONAL CONTROL IMPOSED supplement under the ACTIONS REPORTED section of the Port Safety Activity Report (PSAR).

Units should simply indicate control action taken for passenger vessel examinations, passenger vessel reexaminations, and LOC biennial examinations in the COMMENTS section of the MIAR because these examinations are not normally documented in the PSAR product set.



Reporting of Detention Activity to G-MOC, Requirements and Formats

Report of Detention to G-MOC

This report consists of two parts, the E-mail summary report and the attached file containing the Port State Report of Inspection. Reports shall be e-mailed to fldr-G-MOC@comdt.uscg.mil. The format of the E-mail summary report is as follows:

Subject:	Port State Control Detention Report - (*vessel name*)	
Part A	**POC:**	(*name*), (*telephone number*)
	Boarding Priority:	(*1, 2, 3 or 4*)
	Status:	(*detained on mm/dd/yy* **or** *released on mm/dd/yy*)
Part B	**Comments:**	*any additional information the reporting unit wants to include*) I have determined that the deficiencies as a whole or individually, endanger the ship or persons on board; or present an unreasonable risk to the marine environment if this vessel is allowed to proceed to sea.
	Authorized by:	(*OCMI/COTP name*)

The Port State Report of Inspection, based on the recommended format found in IMO Resolution A.787(19) (Procedures for Port State Control), should be formatted as seen in Figure D2-A-1.

Post-Detention Report to G-MOC

This report generally consists of only the E-mail summary report. Reporting units may provide an updated Port State Report of Inspection if they feel it is necessary or useful. The format for the post-detention E-mail summary report is as follows:

Subject:	Port State Control Post-Detention Report - (*vessel name*)	
Part A	**POC:**	(*name*), (*telephone number*)
	Status:	(*released on mm/dd/yy*)
Part B	**Comments:**	(*brief description of the actions taken with respect to the deficiencies for which the vessel was detained.*)
	Authorized by:	(*OCMI/COTP name*)

CHAPTER 2, ANNEX A: PSC DETENTION REPORTING

PORT STATE REPORT OF INSPECTION		
In accordance with IMO Port State Control Procedures (Res. A.787(19))		
1 Reporting Country: United States of America		
2 Name of Ship: *name*	**3 Flag of Ship:** *flag name*	
3a Owner: *full name* *full mailing address* **IPN:** *IP########*	**3b COFR Applicant (if different than owner):** *full name* *full mailing address* **IPN:** *IP########*	
3c DOC company (if different than owner): *full name* *full mailing address* **IPN:** *IP########*		
4 Type of Ship: *see list on page 24-A-3*		
5 Call Sign: *call sign*	**6 IMO Number:** *L########*	
7 Gross Tonnage: *##,###*	**8 Deadweight Tonnage:** *##,### (if known)*	
9 Year of Build: *####*	**10 Date of Detention:** *month day, year*	
11 Place of Inspection: *city or port, state*	**12 Classification Society:** *name*	
13 Relevant Certificate(s): *list those certificates related to the deficiencies leading to detention*		
a) title	**b) issued by**	**c) dates of issue and expiry**
name of certificate	*name of issuer*	*dd-mmm-yy/dd-mmm-yy*
14 Deficiencies:		
CODE	**DEFICIENCY**	**CONVENTION CITE**
See PSC job-aid	*Description of deficiencies leading to detention*	*Cite take from applicable international convention*
15 Action Taken: Ship detained. *Additional comments deemed appropriate by the OCMI/COTP.*		
16 Notifications: *examples: Flag State, Classification Society, Master, Owner, Operator, Agent, etc.*		

Ship types for use in section 4 of the Port State Report of Inspection:

Code	Name
11	Tankship (not specified)
12	Oer/Bulk/Oil (OBO) Carrier or Combination Carrier
13	Oil Tankship
14	Vegetable Oil Tankship
20	Gas Carrier (not specified)
21	LPG Carrier
22	LNG Carrier
30	Chemical Tankship
40	Bulk Carrier
41	Cement Carrier
50	Unitised Vessel
51	Barge Carrier
52	Vehicle Carrier
53	Containership
54	Pallets Carrier
55	Ro-Ro Cargo Ship
60	General Dry Cargo Ship or General Freight Ship
61	Refrigerated Cargo Carrier
67	Livestock Carrier
70	Ferry
71	Passenger Ship
72	Ice Breaker
73	Factory Ship
74	Research Ship
75	Heavy Load Carrier
76	Supply Ship (offshore)
77	Rescue/Standby Ship
78	Cutter/Dredger
80	Mobile Offshore Drilling Unit (MODU)
81	Dynamically Supported Craft
82	Special Purpose Ship
83	High Speed Craft

SECTION D: PORT STATE CONTROL

CHAPTER 3: PROCEDURES TO ENSURE ACCOUNTABILITY FOR PORT STATE CONTROL BOARDINGS AND DETENTIONS

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CHAPTER 3: PROCEDURES TO ENSURE ACCOUNTABILITY FOR PORT STATE CONTROL BOARDINGS AND DETENTIONS

A. BACKGROUND

1. Introduction

Before implementation of the Port State Control Initiative on 1 May 1994, detention reports were reviewed only to fulfill international obligations. This amounted to tracking and consolidating information submitted in field units' detention reports and providing that information to the International Maritime Organization (IMO). This information included the type of vessel, its flag of registry, the nature of the deficiencies that gave rise to the detention, and the specific international treaty under which the detention was carried out (e.g. the International Convention for the Safety of Life at Sea (SOLAS)). The previous review process did not include a systematic check of a vessel's prior arrivals in U.S. ports to determine if the vessel's condition should have been discovered earlier. This process also did not provide feedback to Coast Guard field units or to operational commanders. Recognizing accountability as an important element in the Port State Control Program, the U.S. Coast Guard established a new review process to address this concern.

2. Congressional Interest

One of the major concerns raised by Congress in the 1994 Department of Transportation Appropriation hearings was the perceived lack of Coast Guard accountability for the conduct of its foreign vessel-boarding program. Congress pointed to recent cases where foreign flag vessels received a clean bill of health at one port only to be cited for substantial discrepancies when visiting another port a short while later. In certain cases, the discrepancies discovered were significant problems with major vessel systems which were obviously the result of long-term neglect by the vessel's owners/operators. These should have been detected at the first port where the vessel was boarded. Regardless of the type of boarding (e.g. annual examination, biennial Letter of Compliance (LOC) examination, reexamination or deficiency follow-up), boarding teams must be alert to the presence of readily detectable discrepancies affecting the vessel's vital systems.

B. REVIEW PROCESS

To ensure program accountability, G-MOC implemented a review process to monitor the effectiveness and quality of Port State Control activities. This review process is initiated by G-MOC upon receipt of a detention Report. The review ensures that boardings are conducted in accordance with the policies set forth in this manual; verifies the applicability of deficiencies cited; and, where necessary, investigates why major discrepancies went undetected during prior boardings or why previous boarding opportunities may have been missed.

1. Purpose

The thrust of this effort is to improve the overall quality and consistency of Port State Control boardings, not to assess blame. Nonetheless, commanding officers are urged to take note of the congressional interest in the program and carefully assess their unit's performance in this extremely important and visible mission area.

2. Record Keeping

A file shall be maintained on each foreign vessel boarding which includes copies of examination books, work lists, detention reports and related message traffic or other correspondence as directed by the Coast Guard Paperwork Management Manual, COMDTINST M 5212.12. Records documenting targeting/boarding decisions do not need to be maintained. A copy of the Marine Information System (MSIS) Port Safety Vessel Scheduler (PSVS) with notations indicating boarding decisions is sufficient. If required boardings are missed, the notations should indicate why (e.g. hurricane, available boarding teams assigned to higher priorities, major oil spill, etc.).

C. PROCEDURES

1. Reporting Requirements

G-MOC uses vessel interventions that lead to detention in U.S. waters as the trigger which initiates the Port State Control review process. A vessel is detained when it is found to be unsafe or when it presents an unreasonable threat to the environment. Whenever a vessel is detained under the provisions of an international convention, the OCMI/COTP notifies the vessel's master, the flag administration, the cognizant district commander (m) and G-MOC in accordance with Chapter D2, Section E, of this volume. On receipt of a report of detention, G-MOC initiates a review to determine if deficiencies were overlooked during previous boardings or if a boarding opportunity at a previous port call was missed.

2. Initial Review

G-MOC will immediately conduct an initial review upon receipt of a Report of detention to determine if the circumstances warranted a detention or whether other methods of Port State Control, as outlined in Chapter D2 of this volume, would have been more appropriate. In verifying the validity of the detention, the following factors must be considered.

Substandard determination

a. If G-MOC determines that the vessel's hull, machinery equipment or operational safety was substantially below standards required by the relevant conventions, or the crew was not in conformance with the safe manning document, the vessel will be considered substandard. Detained vessels determined to be substandard will be reported to the IMO, flag state, owner/operator and posted electronically on the PSC web site.

Boarding History

b. Boarding History. In all valid detention cases, G-MOC will review the vessel's boarding history for the 12 months preceding the detention. The vessel's boarding history is recorded in the MSIS Port Safety Vessel History (PSVH), the Vessel File Contact Log (VFCG) and the Vessel File Involved Parties (VFIP). The history includes information about the vessel such as its type, age, length, tonnage, owner, operator, classification society and flag of registry. The history also includes the date and location of U.S. port calls, the scope of previous boardings, the record of civil penalties, marine casualties, pollution incidents, any U.S. Port State Control measures applied, the status of the vessel's certificates, and a record of outstanding and resolved discrepancies.

Foreign Vessel Targeting Matrix

c. Foreign Vessel Targeting Matrix. The Port State Control program is designed to identify which vessels entering U.S. waters pose the highest probability of being substandard. Under this process, various risk factors are considered to determine a vessel's boarding priority in accordance with the procedures set forth in Chapter D4 of this volume. During the initial review, G-MOC will consider the priority determination to evaluate whether potentially dangerous vessels were overlooked and not boarded in conformance with these targeting procedures.

"*Nonconformity*"

(1) "Nonconformity". Targeting and boarding procedures are specified in MSM II-D1, D4, D5, D6, D7. As such, the prioritization of boardings and the boarding process itself must be consistent for all Coast Guard offices. When high priority vessels are not boarded or when serious deficiencies are not detected, the review process will be used to determine the reason for the apparent deviation from the established process. The failure to follow an established process is termed a "nonconformity."

Investigation

(2) Investigation. G-MOC will review each detention to determine if possible nonconformities exist. If review indicates that a Coast Guard unit did not board a high priority vessel, or if a unit did not detect apparent deficiencies that should have been detected during previous boardings, further investigation will be initiated by notifying the appropriate district commander in writing. The district commander will investigate the matter, take appropriate action, and forward the findings and recommendations of the investigation to G-MOC.

3. Accountability Investigation

G-MOC will notify the cognizant district commander when the initial review reveals an apparent nonconformity.

Methodology

a. Methodology. The district commander will conduct an investigation to determine why boarding opportunities were missed and/or why deficiencies went previously undetected. The investigation will normally involve contacting the affected field unit about the boarding in order to obtain additional information not recorded in MSIS.

Record Keeping Guidance

b. Record Keeping Guidance. Recognizing accountability as an important element in the Port State Control process, the program manager established new record keeping guidance. OCMI/COTPs are to track factors that may impact their ability to meet the Port State Control Initiative's boarding goals and objectives. These factors include the composition of the boarding team, qualifications and experience levels of marine inspectors and boarding officers, and other relevant conditions (e.g. overall unit workload at the time, weather conditions during the boarding, and availability of additional or more qualified personnel). Taking into account all relevant information, the district commander will determine the reason for the apparent nonconformity and recommend any process improvements and remedial action.

4. Corrective Action Plans

District commanders and/or commanding officers, as appropriate, will implement corrective action to prevent recurrence of missed boarding opportunities, undetected deficiencies, or other reasons for failure to meet the Port State Control Program objectives.

Legitimate Nonconformity

a. Legitimate Nonconformity. Certain nonconformities may be attributed to legitimate factors. For example, failure to board a prioritized vessel may be explained by unit work load, personnel unavailability due to pollution response activity, adverse weather conditions, or other circumstances beyond the control of the unit's commanding officer.

Factors

(1) Factors. Legitimate factors for not detecting a "clear grounds" deficiency may include, but are not limited to, obstruction of a structural defect by the vessel's cargo, limited amount of time to conduct the boarding due to factors beyond the control of the boarding team, subsequent removal by the vessel's owner/operators of equipment placed on board the vessel temporarily to pass the examination, or inability to access spaces on the vessel without undue risk to the boarding team.

Action

(2) Action. Where legitimate factors are the under-lying cause of the apparent nonconformity, the district commander may conclude that no process improvements are warranted. The district commander will report this conclusion to Coast Guard Headquarters and the affected field unit, and the matter will be closed.

Flawed Nonconformity

b. Flawed Nonconformity. Alternatively, certain non-conformities may be traced to flaws in the process itself. For example, training programs may have been insufficient to provide personnel with required knowledge, procedures may have been unclear, or methodology or equipment may have been inadequate to successfully complete certain tasks.

Process Flaw

(1) Process Flaw. Where the underlying cause of the apparent nonconformity is a process flaw, the district commander will specify process improvements to prevent the recurrence of the conditions that impaired the unit's ability to achieve the goals established in the Port State Control Initiative. These may include, but are not limited to, improving training programs, adjusting the boarding team complement, clarifying or updating boarding procedures, or providing additional equipment.

Field Unit Mismanagement

(2) Field Unit Mismanagement. Where the source of the nonconformity is field unit mismanagement, district commanders can use the established military and civilian personnel evaluation systems (i.e. the Officer Evaluation System, Enlisted Personnel Evaluation System, and Civilian Performance Management and Recognition System) to take appropriate remedial or disciplinary measures. Nonconformities traced to misconduct or negligence on the part of Coast Guard military or civilian personnel will be handled in accordance with existing disciplinary procedures.

5. Feedback Procedures

A feedback loop is established to promote continuous improvement and provide field commands with revised guidance. The district commander will report the results of all investigations to G-MOC. G-MOC will implement any changes to policy, boarding procedures or training identified by the review process as needed to improve the quality of Port State Control efforts throughout the Coast Guard. On their own initiative, district commanders may implement corrective action plans and process improvements within their area of responsibility. District commands and headquarters will measure the success of process improvements through continued reviews of detention reports.

6. Accountability Provisions

Commanding Officers will use performance evaluations to document an individual's success in implementing corrective actions and enforcing the Port State Control program. Personnel at all levels will be held accountable for meeting the objectives and time lines established in the corrective action plans. Results achieved in this regard are subject to documentation in personnel performance evaluations.

7. Non-Reported Detention Reports

As previously mentioned above, detention reports submitted to Headquarters are reviewed to determine whether the detained vessel was substandard. A small percentage of detention reports submitted to G-MOC do not meet this criteria. When this occurs, G-MOC will send an e-mail to the unit and district which submitted the report, explaining why the detention report was not forwarded to the IMO for reporting purposes. Non-reported detention reports are periodically sent to the Port State Control course for training purposes. It is hoped that with this feedback loop in place, the small number of non-reported detentions presently received will decrease even more in the future and that consistency, both in the field and at Headquarters, will improve.

8. Classification Society Attribution

G-MOC also reviews detention cases to determine whether or not the classification society should be associated with the detention. Field units are strongly encouraged to provide as much information as possible in the detention reports, which will help G-MOC make this determination.

The following filtering principles may be applied for submitting a recommendation as to whether the classification society should be associated with this detention. Recommendations may be included in the e-mail sent to G-MOC-4.

➔ **Refer to Table D3-1 for filtering principles.**

TABLE D3-1: PSC FILTERING PRINCIPLES

Detentions are initiated only when a vessel is unfit to proceed to sea or is a threat to the marine environment.
• Voyage damage will not be associated with a classification society non-conformity unless other class related deficiencies are noted during the course of the damage survey.
• Class non-conformities will only be associated with equipment covered by a survey, conducted by classification society, or in which the classification society has issued the certificate on behalf of the flag State.
• When multiple deficiencies are noted, *only those deficiencies serious enough to justify detention* will be evaluated to determine classification society non-conformities.
• Outdated equipment, when the cause of a detention, will not be associated with a class non-conformity unless the equipment was outdated at the time of the last survey conducted by the classification society on behalf of the flag State.
• The absence of highly pilferable equipment such as fire hose nozzles, fire extinguishers, etc. will generally not be listed as a classification society non-conformity unless a large number is missing and it is *within 90 days* of the last survey by the classification society on behalf of the flag State.
• Expired certificates will not be associated with a classification society non-conformity unless the certificates were not endorsed or were improperly issued by the classification society when they conducted the last survey on behalf of the flag State.
• Detentions based on crewing issues, whether conducted in accordance with SOLAS or STCW will not be listed as class non-conformities.
• A *time limit of 90 days* will generally be placed on associating non-conformities with equipment failures (i.e. non-operational fire-pumps, emergency generators, etc.) unless it is apparent that the deficiency was long standing.
• Serious wastage or other structural deficiencies *not caused by voyage damage* will be listed as a classification society non-conformity.

9. Appeals

As mentioned above, detention reports submitted by the field to Headquarters are reviewed for the validity of the detention and for association to a classification society, if warranted. In accordance with U.S. law, decisions of the OCMI are subject to appeal. This is a necessary and valid step in the detention process. This provision allows the involved party to provide information that may have been overlooked or omitted during the initial detention review process. Owners, operators and classification societies have a vested interest in the appeal process since their association with detentions is cause for their vessels to be targeted for boardings. Appeals received from the company concerning the validity of the detention are processed in accordance with 46 CFR 1.03. Appeals received from the classification society concerning their association with a detention are responded to by G-MOC.

CHAPTER 4: TARGETING OF FOREIGN VESSELS

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CHAPTER 4. TARGETING OF FOREIGN VESSELS

A. BACKGROUND

1. Introduction

The goal of the Port State Control Program is to identify and eliminate substandard foreign merchant ships from U.S. waters and to encourage those committed to trading with the U.S. to adopt management philosophies that ensure compliance with accepted standards. This program was mandated by Congress in the 1994 Department of Transportation Appropriations Bill, which required the Coast Guard to change its approach to foreign vessel boardings to "hold those most responsible for substandard ships accountable, including owners, classification societies and flag states." In part, the program pursues this goal by focusing boarding and examination efforts on those vessels most likely to be substandard. This targeting allows Coast Guard resources to be used more efficiently while rewarding well-managed vessels with less frequent boardings. A targeting matrix is used to identify those vessels at greatest risk of being substandard based on identified risk factors. Using this matrix allows a ship's risk of being substandard to be consistently measured and allows limited Coast Guard resources to be directed towards boarding those which represent the greatest risk.

2. Targeting Philosophy

Applicable Factors

a. Applicable Factors. A comprehensive but simple targeting regime has been devised to consistently focus Coast Guard boarding efforts on those vessels most likely to be substandard. This is a risk-based regime based on five factors. These factors are a ship's owner, flag state, classification society, boarding history and vessel type. The risks associated with each of these factors is determined based on Coast Guard boarding data. These determinations are used to assign points using the targeting matrix, which determines the boarding priority given to foreign vessels entering U.S. waters.

Functionality

b. Functionality. The points assigned to a vessel under this targeting regime do not classify it as substandard; only a boarding and examination can reveal such conditions. The targeting matrix simply helps the Coast Guard assess risk so that limited resources can be focused on those vessels most likely to be substandard. Once on board, Coast Guard personnel must examine the vessel to determine whether it is in substantial compliance with accepted international conventions and U.S. requirements. If it is not, it may then be considered substandard.

Consistency

c. Consistency. To be effective, it is important that this targeting regime be applied consistently. The purpose is to place the onus for maintaining vessels to accepted standards on those most responsible including owners, classification societies and flag states. Linking boarding decisions to the performance records of the ship, the owner, classification society and flag state sends a clear message that the incidence of boardings may be reduced by improving their performance records.

Adherence to the Targeting Regime

(1) Adherence to the Targeting Regime. OCMI/COTP's are expected to ensure available resources are utilized in accordance with the Targeting Regime outlined in this chapter. Annual passenger and tank vessel examinations, biennial Certificate of Compliance examinations and quarterly passenger vessel reexaminations are expected to be performed at the indicated frequency in 100% of the cases. Other boardings are to be conducted to the extent practical, with resources targeted at vessels of the highest priority first.

Modifications

(2) Modifications. Modifications or additions to the targeting criteria by OCMI's/COTP's to address port specific concerns should be documented in locally prepared guidance to ensure consistent application and accountability. In those instances where Priority I vessel boardings and annual examinations cannot be accomplished due to personnel shortfalls, weather or other circumstances, records should be maintained indicating the reason vessels were not boarded.

Boardings After Dark

(3) Boardings After Dark. Because conditions may vary considerably between ports, piers, and even individual vessels, the decision to examine a vessel after dark is left to the discretion of the local OCMI/COTP. A blanket policy of not boarding vessels after dark is unacceptable. Each situation must be individually evaluated based upon existing or forecast weather, sea conditions, resource limitations, ambient lighting, and/or the availability of artificial lighting.

Boardings Delayed Due To Weather, Visibility, Logistics or Resources Limitations

(4) Boardings Delayed Due To Weather, Visibility, Logistics or Resources Limitations. The shipping industry operates 24 hours a day, seven days a week. Consequently, the Coast Guard must be prepared to provide necessary services on the same basis. However, the OCMI/COTP must consider the safety of the boarding team as well as their ability to see and identify potential discrepancies in deciding where and when to board a ship. Existing or forecast weather, sea conditions, visibility, boarding team fatigue, logistics and conflicting resource demands may affect the decision. Within the framework of the targeting regime outlined in this chapter, the OCMI/COTP is encouraged to work with vessel owners, operators, and agents to accommodate scheduling of exams without compromising the safety of the boarding teams.

Effect

d. Effect. When applied consistently, the targeting regime ensures that vessels which pose the very highest risk are boarded during every U.S. port call while vessels that pose the lowest risk are boarded no more than annually. Although the targeting regime will affect which vessels are boarded, where they are boarded and the frequency of boarding, it should not affect the scope of the examination performed while aboard a ship. Examinations are to be conducted in accordance with the policy discussed in MSM II-D1, D5, D6, D7 as appropriate.

B. Targeting Criteria

To implement the targeted boarding regime, it is necessary to identify which vessels, vessel owners, classification societies and flag states are most often associated with substandard ships. These determinations are made by G-MOC based on Coast Guard boarding and intervention data, and are distributed monthly by message. To understand how these determinations are made, it is necessary to define certain terms of reference.

1. Targeted Owner

A targeted owner includes any owner, operator, or managing operator whose vessels have been detained in the U.S. more than once within the previous 12 months under the provisions of an international convention. If a vessel owner or operator has at least 25 vessels that visit U.S. ports each year, the company will not be targeted unless it accumulates 3 or more detentions within a 12-month period. To reduce our administrative burden, we will continue to target an owner with the current "2 in 12" criteria, but we will give the company involved an opportunity to demonstrate their fleet size.

Targeted Owners List

a. Targeted Owners List. G-MOC develops and maintains a current listing of targeted owners based on detention reports received from field units. The list is updated monthly.

Application

b. Application. All vessels associated with a targeted owner receive 5 points under Column I of the Foreign Vessel Targeting Matrix (See Figure D4-1), not just vessels that were previously detained under the provisions of an international convention.

Removal

c. Removal. A targeted owner is removed from the list if they are associated with less than two detentions carried out under the authority of an international convention within the previous 12 months.

Verification of Owners and Operators

d. Verification of Owners and Operators. During boardings, field units should ensure Marine Safety Information System (MSIS) entries regarding owners and operators are accurate, regardless of whether a boarding results in a vessel being detained. Brokerage firms and shipping agents normally do not assume responsibility for ship's maintenance or operations and should not be listed as owners or operators. Detention reports provided by field units should include the ship's owner as indicated on the ship's registry and the operator as indicated by the ship's Certificate of Financial Responsibility. If the vessel is ISM Certified, ensure that the Document of Compliance Company is entered as owner or operator.

MSIS Entries

e. MSIS Entries. Field units should update MSIS within 48 hours of a boarding if MSIS entries differ from that indicated by the ship's papers to ensure accurate targeting.

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2. Targeted Flag State

A targeted flag State is a country with an intervention ratio exceeding the average detention ratio for all flag States with vessels operating in U.S. waters and which has been associated with more than a single detention carried out under the authority of an international convention within the past 12 months.

Flag State Detention Ratio

a. Flag State Detention Ratio. A flag State's detention ratio is calculated by dividing the number of its vessels detained under the authority of an international convention by the number of vessels under its registry, which entered U.S. waters. An average detention ratio for all flag States with vessels operating in U.S. waters is obtained by dividing the number of vessels detained under the authority of an international convention by the number of vessels that entered U.S. waters. Ratios are calculated based on the previous three years' data to reduce the effects of any anomalies.

Targeted Flag State List

b. Targeted Flag State List. This list consists of the targeted flag States compiled by G-MOC on an annual basis for use with the foreign vessel-targeting matrix.

Application

c. Application. All vessels registered with a targeted flag State are assigned 7 points in Column II of the Foreign Vessel Targeting Matrix (see Figure D4-1), not just vessels that were previously detained under the provisions of an international convention.

Removal

d. Removal. A targeted flag State is removed from the list when its detention ratio drops below the average detention ratio for all flag States with vessels operating in U.S. waters or when it is associated with less than two detentions carried out under the authority of an international convention within the past 12 months.

Release of Information

e. Release of Information. The targeted flag State list is intended for publication.

Verification of Flag State

f. Verification of Flag State. During boardings, field units should ensure MSIS entries regarding flag States are accurate, regardless of whether a boarding results in a vessel being detained.

MSIS Entries

g. MSIS Entries. Field units should update MSIS within 48 hours of a boarding if MSIS entries differ from that indicated by the ship's papers to ensure accurate targeting.

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3. Targeted Classification Society

Classification Societies are evaluated on their performance over the previous three years. Classification Societies with less than ten distinct arrivals in the previous year are filtered out. If they have been associated with any detentions in the previous three years, they receive priority 1 status. If they have not been associated with any detentions in the previous three years they receive zero points. Classification Societies with more than ten distinct arrivals in the previous year are evaluated on their performance over the previous three years.

Classification Society

a. Classification Society. A classification society is an organization, other than a flag State, that issues Certificates of Class and/or International Convention Certificates.

Targeted Classification Society List

b. Targeted Classification Society List. The Targeted Classification Society List contains the names of classification societies that will receive points in the foreign vessel-targeting matrix.

Classification Society Detention Ratios

c. Classification Society Detention Ratios. Classification Society performance is based on their class-related detention ratio (number of class-related detentions divided by the number of distinct arrivals). This ratio is then compared to the average detention ratio (total number of class-related detentions divided by the total number of distinct arrivals). These Classification Societies are then assigned points according to where their detention ratios fall in relation to the average detention ratio.

Class Society's Ratio Relative to Average Detention Ratio (ADR)	Matrix Point Assignment
Below ADR	0 Points
ADR up to 2X ADR	1 Point
Between 2X and 3X ADR	3 Points
Between 3X and 4X ADR	5 Points
Greater than 4X ADR	Priority I Target

Verification of Classification Societies

d. Verification of Classification Societies. During boardings, field units should ensure MSIS entries regarding classification societies are accurate, regardless of whether a boarding results in a vessel being detained. Detention reports provided by field units should include the ship's classification society. The classification society is the company that issued the ship's certificate of class. In some cases, other certificates (i.e. the International Convention for Safety of Life at Sea (SOLAS) Safety Construction Certificate, SOLAS Safety Equipment Certificate, SOLAS Passenger Ship Safety Certificate and Load Line Certificate) may be issued by other classification societies or by the flag State. The classification society entered under the Vessel File Involved Party (VFIP) product set of MSIS should be the one that issued the certificate of class. The Vessel File List of Documents (VFLD) product set should be used to document the issuing authority of other documents. Targeting decisions under Column III of the foreign vessel-targeting matrix are left to the discretion of the OCMI/COTP. For example, if a vessel is classed by a 0 point category organization, but all Convention certificates are apparently issued by a targeted organization, the COTP should consider assigning points in the matrix that corresponds with the targeted class society.

MSIS Entries

e. MSIS Entries. Field units should update MSIS within 48 hours of a vessel boarding. Units should enter or update the classification society in the VFIP product set using the following alternate IPNs:

MSIS CLASS SOCIETY IDENTIFICATION TABLE

Classification Society		Alternate IPN
American Bureau of Shipping		ABS
Biro Klasifikasi Indonesia		KI
British Telecom		BT
Bulgarski Koraben Registrar		BKR
Bureau Veritas		BV
China Classification Society		CCS
China Corporation Register of Shipping		CR
Compania Nacional de Registro e Inspeccion de Naves		CNRI
Croatian Register of Shipping		CRS
Det Norske Veritas		DNV
Germanischer Lloyd		GL
Hellenic Register of Shipping		HRS
Honduras Bureau of Shipping		HBS
Honduras International Naval Survey & Insp. Bureau		HINSB
Horizon International Surveying & Inspection Bureau		HNS
Indian Register of Shipping		IRS
International Merchant Marine Registry of Belize		IMRB
International Naval Surveys Bureau		INSB
International Register of Shipping		BSS
Isthmus Bureau of Shipping		IBS
Korean Register of Shipping		KRS
Lloyd's Register of Shipping		LR
Maritime Inspection Corporation		MIC
Maritime Register of Shipping		RS
Monserrat Shipping		MS

MSIS CLASS SOCIETY IDENTIFICATION TABLE - CONTINUED		
Nippon Kaiji Kyokai		NKK
Panama Bureau of Shipping		PBS
Panama Maritime Documentation Service		PMDS
Panama Maritime Surveyors Bureau, Inc		PMS
Panama Register Corporation		PRC
Panama Shipping Register		PSR
Polski Rejestr Statkow		PRS
Registro Italiano Navale		RINA
Registrul Naval Roman		RNR
Russian Maritime Register of Shipping		RS
Turku Lloyd Vafki		TL
Ukraine Maritime Register of Shipping		URS
Vietnam Register of Shipping		DKVN

NOTE: To ensure the integrity of the database, field units should not create new IPNs to enter classification society data. New IPNs will be created by G-MOC as needed, upon request. Requests may be forwarded by e-mail to fldr-G-MOC@comdt.uscg.mil.

C. Matrix Instructions

Upon receipt of an advance notice of a foreign vessel arrival, log into MSIS to check the ship's Port Safety Vessel History (PSVH) and VFIP product sets. The former should provide most of the essential targeting information including owner, operator, flag State, boarding history and type of ship. However, the classification society identified in the VFIP product set will not automatically appear on the PSVH screen. Therefore, the VFIP product set must be checked separately to identify the classification society. Use the Foreign Vessel Targeting Matrix (Figure D4-1) and follow the steps indicated to determine the ship's boarding priority.

1. Column I

a. If the owner, operator or managing operator of a vessel is included on the current Targeted Owners List provided by G-MOC, assign 5 points.

b. A maximum total of 5 points may be assigned.

c. Proceed to Column II.

2. Column II

a. Check the vessel's flag State against the current targeted flag State list. If the flag State is listed as a targeted flag State, assign 7 points.

b. Proceed to Column III

3. Column III

a. Check the vessel's classification society against the current targeted classification society list. If the classification society is listed as a targeted classification society, assign the appropriate number of points as indicated in the monthly message.

b. Proceed to Column IV.

4. Column IV

a. If the PSVH product indicates that the vessel has been the subject of an intervention leading to detention within the past 12 months, assign 5 points for each detention. A Vessel of Particular Interest Notice (VPI) is entered by G-MOC after reviewing detention reports received from field units. This notice will assist in identifying vessels detained within the previous 12 months, but may not include very recent detentions. Field units must check the Operational Control section of the PSVH to determine whether any recent detentions have occurred.

b. If PSVH indicates that the vessel has been the subject of any other form of operational control within the past 12 months (i.e. COTP Order or Customs hold), assign 1 point for each incident. Do not assign multiple points to incidents where more than one control action was taken during a single port call.

c. If PSVH indicates that the vessel has been involved in any marine casualty or pollution cases (MC cases) within the past 12 months, assign 1 point for each MC case.

d. If PSVH indicates that the vessel has been the subject of a marine violation within the past 12 months, assign 1 point for each MV case. Letters of deviation are not considered marine violations for this section. Do not assign points.

e. If PSVH indicates the vessel has not been boarded in the past 6 months, assign 1 point.

f. The total points in Column IV are unlimited.

g. Proceed to Column V.

5. Column V

a. If the vessel is an Oil or Chemical Tanker, assign 1 point.

b. If the vessel is a Gas Carrier, assign 1 point.

c. If the vessel is a Bulk Freighter 10 or more years old, assign 2 points.

d. If the vessel is a Passenger Ship, assign 1 point.

e. If the vessel is carrying a low value commodity in bulk, assign 2 points. Examples of low value commodities include, but are not limited to, scrap metal, tallow, asphalt, sugar, and paper.

f. A maximum total of 4 points may be assigned.

g. Proceed to Step 6.

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6. Total

a. Total the points assigned from each column.

b. Compare the total with the Foreign Vessel Targeting Criteria priority as determined through a review of the description of priority I, II, III, and IV boardings.

FIGURE D4-1: FOREIGN VESSEL TARGETING MATRIX

OWNER	FLAG	CLASS	HISTORY	SHIP TYPE
5 Points Listed Owner or Operator	**7 Points** Listed Flag State	**Priority 1** ≥10 arrivals with detention ratio more than 4 times the average OR <10 arrivals and involved with at least one detention in the previous 3 years.	**5 Points Each** Detention within the previous 12 months.	**1 Point** Oil or chemical Tanker
		5 Points **≥10 arrivals with a detention ratio between 3 & 4 times the average.**	**1 Point Each** Other operational control within the previous 12 months	**1 Point** Gas Carrier
		3 Points ≥10 arrivals with a detention ratio between 2 & 3 times the average.	**1 Point Each** Casualty within the previous 12 months.	**2 Points** Bulk Freighter over 10 years old.
		1 Point ≥10 arrivals with a detention ratio between the average and twice the average.	**1 Point Each** Violation within the previous 12 months.	**1 Point** Passenger Ship
		0 Points ≥10 arrivals with a detention ratio below the average **OR** <10 arrivals with no detentions in the previous 3 years.	**1 Point Each** Not boarded within the previous 6 months.	**2 Points** Carrying low value commodities in bulk.

D. IDENTIFYING AND SCHEDULING PRIORITY BOARDINGS

The matrix is one part of the process for determining a ship's boarding priority. Using the score on the matrix, as well as other information obtained about the ship, determine the ship's priority designation based on the criteria listed below.

1. Priority I Vessels

a. Priority I Vessels include:

(1) Stateless vessels;

(2) Vessels suspected of involvement in a marine casualty that may have affected seaworthiness;

(3) Vessels suspected of hazarding the port or environment as a result of a hazardous materials release, or an ongoing discharge of oil;

(4) Vessels specifically targeted for boarding as Priority I vessels by the Commandant as noted in MSIS (or by targeted class list);

(5) Vessels specifically targeted by the OCMI/COTP for boarding prior to entry based on specific information or other identifiable criteria indicating a high likelihood that a vessel is substandard; and

(6) Vessels scoring 17 or more points on the targeting matrix.

Priority I Boarding

b. Priority I Boarding. Priority I vessels will be scheduled for examination prior to entering a U.S. port. The boarding team will include a marine inspector. When feasible, discrepancies will be corrected prior to entry. Exceptions to at-sea boardings may be made when the Officer in Charge Marine Inspection (OCMI) or Captain of the Port (COTP) determines that the risks to boarding personnel or other logistical considerations make an at-sea boarding impractical. In such cases, the vessel will be targeted for examination, and any discrepancies corrected, prior to the commencement of cargo transfer operations or passenger embarkation. If a vessel is targeted for boarding solely as a result of scoring a total of 17 or more points on the targeting matrix, or because of a Priority 1 class society, and has been boarded within 6 months, the vessel may be reduced to Priority III status provided no serious deficiencies were identified during the last boarding.

2. Priority II Vessels

a. Priority II Vessels include:

(1) Vessels that do not have, or are past due for, an annual Tank Vessel Examination, Biennial Certificate of Compliance Examination, or Annual Control Verification Examination;

(2) Vessels with overdue outstanding requirements issued at previous examinations;

(3) Vessels that lack a record of previous Coast Guard examination;

(4) Vessels that have engaged in an international voyage and have not been examined since being released from a port state intervention carried out by the U.S. or any other party to the applicable convention (vessels that have been successfully examined by a Paris or Tokyo MOU Port State since release from a U.S. detention may be downgraded to Priority III if they score less than 6 points on the matrix-check with agent); and

(5) Vessels scoring a total of 7 - 16 points on the matrix.

Priority II Boarding

b. Priority II Boarding. Normally, Priority II vessels will be scheduled for examination prior to commencement of cargo operations or passenger embarkation. Examinations may be conducted after port entry, but discrepancies should be corrected prior to commencing cargo transfer operations or embarking passengers. Exemptions may be permitted based on a general examination or other indications that a vessel is in substantial compliance with applicable standards. If a vessel is targeted for boarding solely as a result of scoring 7 or more points on the targeting matrix and has been boarded within 6 months, the vessel may be reduced to Priority III vessel status provided no serious deficiencies were identified during the last boarding.

3. Priority III Vessels

a. Priority III Vessels include:

(1) Vessels that do not have, or are past due for, an annual Freight Vessel Examination, or quarterly Control Verification Examination,

(2) Vessels alleged to be substandard by a member or members of the ship's crew, a professional or other association, a trade union or any other interested person(s); and

(3) Vessels scoring a total of 4 to 6 points on the matrix.

Priority III Boarding

b. Priority III Boarding. Priority III vessels may be targeted for examination after entry into port without restrictions on the start of cargo operations or passenger embarkation. Discrepancies should be corrected prior to departure except as permitted by the OCMI/COTP. When exceptions are made, discrepancies must generally be corrected prior to entry into next U.S. port.

4. Priority IV Vessels

a. Priority IV Vessels include:

1. Vessels possessing none of the critical criteria discussed under the higher priorities; and

2. Vessels scoring a total of 0 to 3 points on the matrix.

Priority IV Boarding

b. Priority IV Boarding. Priority IV vessels will not be targeted for boarding. To encourage vessel operators to keep their vessels in substantial compliance, COTP/OCMI's should not routinely board Priority IV vessels.

E. DETERMINING TIME AND LOCATION OF BOARDING

Once a priority determination is made, the vessel will be boarded and examined. The following criteria is provided as a guide to determine where and when the boarding will take place. This is not intended to limit the options of the OCMI or COTP or to preclude the use of proper judgement in determining boarding priorities. It is fully recognized that personnel shortages, logistics, weather and other unforeseen events may lead to circumstances which would interfere or prevent boardings from occurring in accordance with this guidance.

1. Quality Over Quantity

Of paramount importance is the quality of vessel boardings and examinations. When faced with limited resources or adverse conditions that prevent complete examinations on all applicable ships, personnel are expected to conduct thorough examinations on those vessels of highest priority rather than cursory, or incomplete, examinations of all Priority I, II, III or IV ships. The quality of the boarding takes priority over the quantity of vessels examined. This is not to say that every examination must be all encompassing. Rather, it means that each examination should consist of at least a check of the vessel's documents followed by a general walk-around examination of the ship. If no obvious deficiencies or signs of neglect, severe wastage or mismanagement are evident during this examination, the boarding may be terminated. If evidence of problems is observed, the examination must progress into the expanded portion of the exam to the extent necessary to ascertain the scope of the problem and the corrective measures needed.

Records

a. Records. Records of boarding decisions do not need to be maintained. See Section D.3.B of this volume.

2. Boarding at Sea

In the 1994 DOT Appropriations Bill, Congress mandated that the Coast Guard ensure vessels comply with applicable standards prior to entering port rather than prior to their departure. Recognizing the inherent risks to boarding teams, logistical costs, and the increased time commitment needed to conduct at-sea boardings the targeting criteria were designed to strike a balance between at-sea boardings and boardings in port. In part, targeting owners, classification societies and flag States with poor performance records encourages compliance prior to entering U.S. ports. However, in the case of Priority I ships, this encouragement is not enough.

Priority I Vessel Boardings

a. Priority I Vessel Boardings. Priority I vessels, which include those vessels suspected of presenting an imminent threat to life, the port, or the environment, will be targeted for boarding prior to entry into port. All efforts should be made to board prior to port entry. In general, this means within the 12-mile territorial sea limits, but prior to crossing the headlands or entrance into the port. Cooperation among M and O resources is essential to effectively board Priority I vessels prior to port entry. District M officers and COTPs are encouraged to work with District O and Group commands to facilitate the use of WPBs and small boats as boarding platforms. If a vessel cannot be boarded at-sea due to weather, logistical or other resource constraints, it should be boarded at the earliest opportunity thereafter, whether at the sea buoy, a designated anchorage, or some other point convenient to the boarding process. The onus is upon the OCMI/COTP to notify a vessel when port entry is to be restricted or delayed.

Delays

b. Delays. Delays to the vessel are to be minimized to the extent practicable. This does not mean that a vessel cannot be asked to stop and meet a boarding team at some pre-designated position. Also, it does not preclude short delays necessary to accommodate the safety of the boarding team. However, unless specific information is known about a vessel indicating it presents an imminent threat to life, the port, or the environment, it should not be unduly delayed because of Coast Guard resource or logistical constraints. Suspicion based upon the ship's owner, classification society or flag State alone is insufficient grounds to delay a ship. Specific information could include, but is not limited to: previous boarding experience with the ship, allegations by the ship's crew or other interested parties that the ship is substandard, reported casualties, equipment failures, or evidence of an oil spill or hazardous materials release.

Reporting of Priority I Non-Boards

c. Reporting of Priority I Non-Boards. Priority I non-boards must be reported to the appropriate district commander. In addition, a Vessel File Particular Interest (VFPI) note indicating that the vessel was not boarded must be entered in MSIS by the cognizant COTP.

3. Boarding Before Cargo Operations or Passenger Embarkation

Priority II vessels are normally targeted for boarding prior to commencing cargo operations or embarking passengers. The onus is upon the OCMI/COTP to notify a vessel when cargo or passengers operations are to be restricted or delayed.

Delays

a. Delays. It is not intended that cargo operations or passenger embarkation be unduly delayed. No vessel should be restricted or delayed based solely upon points received as a result of owner, flag State, or classification society association. The OCMI/COTP should not delay operations pending the arrival of a boarding team unless specific information exists indicating the vessel presents an imminent threat to life, the port, or the environment. Specific information could include but is not limited to: previous boarding experience with the ship, allegations by the ship's crew or other interested parties that the ship is substandard, evidence of a casualty, equipment failures, or evidence of an oil spill or hazardous materials release. Absent specific information, it is the responsibility of the OCMI/COTP to get a boarding team to the vessel prior to the start of these operations. In some cases, the particular hazards created by the ship's condition or the nature of its cargo necessitate the expedited removal of cargo or passengers. The OCMI/COTP must be sensitive to these situations and apply common sense in imposing restrictions.

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CHAPTER 5: PROCEDURES APPLICABLE TO FOREIGN FREIGHT VESSELS

A. GENERAL PROVISIONS

Under Coast Guard policy set forth in the "M" Business Plan (COMDTINST 16000.26) each foreign freight vessel shall be examined in accordance with the Targeting Procedures outlined in MSM II-D4.

B. COMPLIANCE WITH U.S. REGULATIONS

In addition to the Pollution Prevention Regulations (33 Code of Federal Regulations (CFR) parts 151, 155-157, 159) and the Navigation Safety Regulations (33 CFR part 164) foreign vessels are subject to the requirements of the Hazardous Materials Transportation Act (HMTA) (49 U.S.C. 1802 et seq.) when in U.S. waters. The applicable regulations are found in 46 CFR Part 150 and 49 CFR Parts 107, 171-179.

1. Oil-Bulk-Ore (OBO) Vessel Change of Status; Conversion to a Non-Tank Vessel

The definition of "tank vessel" in 46 U.S.C. 2101(39) includes all vessels which are constructed or adapted to carry, or that carries, oil or hazardous material in bulk as cargo or cargo residue. Therefore, any vessel, including an Oil-Bulk-Ore (OBO) vessel, which is constructed or adapted to carry oil or hazardous materials in bulk as cargo, is considered a tank vessel even if it does not carry oil or hazardous material when trading in the U.S. For business reasons, owners of these types of vessels may wish to remove the vessel from tank vessel status.

Vessel Change of Status

a. Vessel Change of Status. Following the decision to remove a vessel from the bulk oil or hazardous material trade, the vessel's owner should:

(1) Request from its classification society or flag state that its International Oil Pollution Prevention Certificate (IOPP), along with the Form A Supplement, be reissued to indicate that the vessel does not carry oil in bulk as cargo.

(2) Apply to the Coast Guard National Pollution Funds Center (NPFC) if the owner desires to have the Certificate of Financial Responsibility (COFR) revised to reflect non-tank vessel status.

Enforcement Action

b. Enforcement Action. During annual examinations and reexaminations, the boarding team shall verify that the vessel's documents all properly indicate the "non-tank vessel" status. They shall update the Marine Safety System (MSIS) Vessel File List of Documents (VFLD) for the vessel to indicate the change in status from a tank vessel to non-tank vessel.

(1) If a vessel's certificates indicate "non-tank vessel" status, but cargo oil or hazardous materials are found to be carried in bulk on board, the vessel will not be allowed to transfer cargo oil. The vessel is in violation of its IOPP Certificate and shall be detained until enforcement actions are completed as provided in Volume I, Chapter 4.I.1.e. of this manual. Additionally, enforcement actions shall be initiated pursuant to a COFR violation as provided in Volume I, Chapter 4.I.1.d. of this manual.

C. CONDUCTING FREIGHT VESSEL EXAMINATIONS

1. Scheduling

The arrival of most freight vessels can be anticipated by the advance notice of arrival provided under 33 Code of Federal Regulations (CFR) 160.201. Arrivals of other freight vessels may be discovered during harbor patrols, or from information provided by Vessel Traffic Services, local pilots, or local agencies such as the Maritime Administration or Port Authority. Using the targeting procedures described in Chapter D4 of this volume, Officers in Charge Marine Inspection (OCMI) or Captains of the Port (COTP) shall identify high priority vessels entering their zones. After identifying those vessels to be boarded, the examinations will be scheduled using the Marine Information System (MSIS) Port Safety Vessel Scheduler (PSVS) product set and a boarding team will be assigned. Boarding teams assigned to conduct Priority I boardings shall include a marine inspector. Other boarding teams should include a marine inspector if resources permit. Teams should also be scheduled to monitor cargo transfers if vessel operations permit.

2. Coordination With The National Cargo Bureau

Determine if the NCB intends to board the vessel during the port call. NCB activity is limited to cargo requirements and does not address the non-cargo vessel requirements (i.e., SOLAS, MARPOL, STCW, ILO, navigation safety and pollution prevention). When the NCB is boarding the vessel, consideration should be given to concentrating Coast Guard efforts on those areas not addressed by the NCB and relying on the NCB report to ascertain the vessel's compliance with applicable cargo requirements.

3. Pre-Boarding Preparations

Prior to arrival at the vessel, the boarding team must review the available MSIS data and regulations to determine the required examination activities for the boarding. Extract the basic information from the MSIS Port Safety Vessel History (PSVH) for use during the boarding (including: name, flag, call sign, tonnage, date/port of last Coast Guard boarding, recent spills, outstanding discrepancies, status of certificates and documents, etc.). Classification society information should be checked in the Vessel File Involved Party (VFIP) product set. A check of the MSIS history of the vessel may indicate that certain information must be confirmed or updated during the boarding to keep MSIS records current. It may also indicate outstanding discrepancies that you should check. Since 49 CFR 107 and 171 do not require a carrier's registration to be on board, it will not always be possible to check for that during a boarding. However, if registration or lack thereof is verified prior to the boarding, appropriate action can be taken at the time of the boarding if packaged hazardous material is being carried by the vessel.

4. Approaching The Vessel As you approach the vessel, look for the following:

a. Cargo transfer operations;

b. Placards and labels attached to cargo being loaded or waiting to be loaded (noting nature of cargo involved);

c. Evidence of cargo leaks or pollution dockside, around palletized or containerized cargo, and around the vessel;

d. Warning signs and signals;

e. The general condition of the facility (or other vessel) adjacent to the vessel being boarded;

f. The general condition of the vessel;

g. The location of the vessel's load line (if the vessel is trim and the load line mark is submerged, the COTP should be notified);

h. The vessel's draft readings;

i. Suitability of the moorings and the gangway; and

j. General evidence of unsafe practices or conditions.

5. Boarding the Vessel Upon boarding the vessel, identify yourself as a representative of the U.S. Coast Guard, Marine Safety Office or Marine Safety Activity as appropriate, and ask to see the master or chief mate (or the senior deck officer on duty). Introduce yourself and advise that the purpose of this visit is to conduct a Port State Control Examination.

a. When conducting an annual examination, advise the master that the examination will consist of a document check, a general examination, operational testing of specific equipment (i.e. steering, firemain, and navigation equipment as a minimum) and emergency drills. If applicable, it may also include a follow-up on any outstanding discrepancies.

b. When conducting a reexamination, advise the master that the examination will consist of a document check and a general examination as a minimum. If applicable, it may also include a follow-up on any outstanding discrepancies.

In either event, ensure that the master understands that the boarding team reserves the right to expand the examination if "clear grounds" are established to doubt the validity of the vessel's certificates (See MSM II-D1.I). The depth and scope of the examination must be determined by the boarding team based on their observations. A satisfactory check may be accomplished simply by sighting a piece of equipment in some cases, while in others it may be necessary to look, question or test more closely.

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6. Examination of Documents Sight and review pertinent vessel documents, certificates, and officers' licenses. Make sure they are current. Determine whether the vessel's hull, deck, internal structure, cargo hatches, piping or required equipment has been damaged or undergone repair since the last Coast Guard examination. Also determine whether any outstanding conditions of class exist. Check to see if the vessel is overdue for dry-docking or repair. If after boarding it is determined from records aboard a vessel that the vessel is not due for an examination, or that the vessel's boarding priority is lower than MSIS records indicate, advise the vessel's officer that you will limit your examination to a less extensive reexamination. Do not leave the vessel without at least completing a cursory document check and a general "walk through" examination to ensure no obvious deficiencies exist.

The document check should include the following as appropriate:	
❑ Certificate of Registry	❑ Oil Transfer Procedures
❑ Classification Society Certificate	❑ Dangerous Cargo Manifest
❑ SOLAS Safety Construction Certificate	❑ Stowage Plan
❑ SOLAS Safety Equipment Certificate	❑ Hazardous Materials Training Records
❑ SOLAS Safety Radiotelegraphy Certificate	❑ Pollution Prevention Compliance Letter
❑ SOLAS Safety Radiotelephone Certificate	❑ ISM Certificates
❑ Load Line Certificate	❑ Shipboard Oil Pollution Emergency Plan
❑ Tonnage Certificate	❑ Cargo Securing Manual
❑ Certificate of Financial Responsibility	❑ Garbage Management Plan
❑ Safe Manning Document	❑ Oil Record Book
❑ International Oil Pollution Prevention Certificate or equivalent	

IOPP Certificate

a. IOPP Certificate. Review the International Oil Pollution Prevention (IOPP) Certificate. Ensure that for countries which are not signatory to the International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 (MARPOL 73/78), the equivalent documentation is Coast Guard acceptable. Check the Oil Record Book to ensure that it has been maintained properly. Navigation Vessel Inspection Circulars (NVIC) 8-83 and 6-94 (CH-1) provide additional guidance for MARPOL 73/78 enforcement.

Safe Manning Document

b. Safe Manning Document. SOLAS, Chapter V, Regulation 13, requires all ships of 500 gross tons and more on international voyages to be issued a safe manning document. This document states what the flag State considers to be the minimum complement necessary to ensure the vessel is sufficiently manned from the point of view of safety. There is no standard format for a safe manning document, though some guidance on the elements to be included in the document can be found in IMO Resolution A.481(XII), Annex 1, and guidance to be taken into account in determining safe manning can be found in Annex 2 of that IMO resolution. However, there are no specific manning scales which can be considered as an internationally agreed standard for assessing the adequacy of the crew complement on a seagoing ship. Therefore, the boarding team must use good judgment in questioning a flag State's determination of the adequacy of a vessel's manning level.

(1) Every foreign flag vessel of 500 gross tons or more visiting a U.S. port should have on board a safe manning document issued by the vessel's flag State. If the document is in a foreign language, an English translation is to be available. The document should contain the following information:

(a) Identification of the ship;

(b) A table showing the numbers and grades of personnel required to be carried, together with any special conditions or limitations based on the particulars of the ship or the nature of the service upon which it is engaged; and

(c) The date of issue and expiration along with a signature for and the seal of the Administration.

(2) In the event a safe manning document is available, the flag State is a party to SOLAS, the information in the document is complete, and the required crew complement is consistent with normal expectations for a ship of its size and service, no further action is required with respect to the manning document itself. Attention may then be directed to determining that the crew is appropriately certificated under the STCW convention (as discussed below).

International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 as amended in 1995 (STCW 95)

c. International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 as amended in 1995 (STCW 95). During all foreign vessel examinations, boarding officers shall compare the crew certificates with the requirements of the vessel's Safe Manning Document, check posted watch arrangements for appropriate rest periods, and examine the specific new crewmember familiarization procedures. The 1995 STCW amendments made many significant changes to the Convention, and are discussed in detail in NVIC 3-98. Refer to NVIC 3-98 for a summary of changes, a discussion of clear grounds to expand a general examination, and deficiencies that may be deemed to pose a danger to persons, property, or the environment. The following guidance is to be followed when non-STCW 95 Certificates are encountered:

Non-Party Flag States

(1) Flag States not party to STCW 78 or 95: Confirm that the flag State is not party to the Convention. If not, follow the guidance in Chapter D2 E.3.a of this volume.

STCW Flag States

(2) Flag States where STCW entered into force less than five years from vessel boarding: Transitional provisions of the Convention will allow flag States to continue to issue Certificates under the terms of the previous Convention for five years. States may continue to issue STCW 78 Certificates until February 1, 2002, to all mariners who commence training or seagoing service before August 1, 1998.

Hazardous Material Training

d. Hazardous Material Training. Title 49 CFR 176.13 requires records to be maintained aboard the vessel of the hazardous materials training required by 49 CFR part 172. A check should be made for documentation that personnel have received appropriate training.

Dangerous Cargo Manifest Check

e. Dangerous Cargo Manifest Check. Ask if the vessel is (or will be) carrying any packaged hazardous materials. If it is, ask to see the vessel's dangerous cargo manifest (DCM). Check the DCM to ensure completeness. Also note the nature and stowage locations of the various hazardous materials from the DCM and list a few specific hazardous material shipments on board. Also examine the planned stowage of hazardous cargo to determine if the general handling, stowage, and segregation requirements are met. Verify the following items on the DCM:

(1) Vessel's name, flag, official number, and/or call sign are listed;

(2) General cargo is not listed;

(3) Proper shipping names and identification numbers are listed (no improper use of dittos or abbreviations for proper shipping name);

(4) Proper hazard classifications are entered without dittos or abbreviations;

(5) The number and description of packages and their gross weights are properly entered;

(6) Any additional description required by 49 CFR 172.203 (i.e., Limited Quantity, Poison, Reportable Quantity, etc.) is listed;

(7) The stowage location for each hazardous cargo is accurately indicated;

(8) Emergency response telephone number is listed for each cargo listed;

(9) It is signed and dated by the preparer; and

(10) It is signed by the master or licensed deck officer.

Garbage Management Plan (GMP)

f. Garbage Management Plan (GMP). These plans should be examined during annual and reexams. These are written procedures for collecting, storing, processing, and disposing of garbage, including the use of equipment on board. It should designate the person responsible for carrying out the plan and should be in the working language of the crew. The Plan was made mandatory by an amendment to MARPOL 73/78 which added regulation 9 to Annex V. It is important because it requires ship operators to track their garbage and take notice of what happens to it. Missing GMP's are not sufficient grounds, in and of themselves, for a detention.

Global Maritime Distress and Safety System (GMDSS)

g. Global Maritime Distress and Safety System (GMDSS). There are exceptions, but GMDSS equipment is required on all cargo ships of 300 gross tons and over as of 1 February 1999. During general examinations, briefly examine the GMDSS equipment as required by SOLAS IV, with further guidance described in NVIC 3-99. An expanded exam program is being developed that will focus on STCW GMDSS operators, when clear grounds are established that radio operators pose a danger to the environment because of repeated false alert transmissions. The method to identify these targeted vessels, training requirements, and personnel resources available to augment MSO boarding teams to perform these limited competency assessments are still being developed. Until this program is implemented, boarding officers are not expected to perform expanded STCW GMDSS operator competency assessments.

7. General Examination

During annual examinations and reexaminations, conduct a general "walk through" examination of the vessel. The general examination should include observation of required equipment on deck, in the engine room, and in after steering. Verify the adequacy, maintenance, and operation of firefighting, pollution prevention, and other equipment required by regulations. Look for obvious safety problems. Verify that the stowage location for hazardous cargoes is accurately indicated.

Navigation Safety Equipment Check

a. Navigation Safety Equipment Check. During annual examinations and reexaminations, determine through operator competence (STCW) if all equipment was working properly during the last voyage. If equipment is not working, determine when repairs will be made. If a major piece of electronic equipment (like the radar or Automatic Radar Plotting Aid (ARPA)) is not operational, the OCMI/COTP should be contacted for instructions.

During annual examinations conduct a thorough check of the bridge and navigation spaces for compliance with the Navigation Safety Regulations (33 CFR 164). Ask to have the electronic equipment energized if cargo operations permit.

SAFETY NOTE: Energizing Equipment During Cargo Operations Could Pose A Safety Hazard.

Check the complete list of navigation safety items, paying special attention to the extra requirements for vessels over 10,000 gross tons. Check or test the equipment paying particular attention to the following:

Position Fixing Device

(1) Position Fixing Device (LORAN C, Satellite Navigation System (SATNAV) or GPS). Energize the equipment. Check that the receiver is able to lock on and track the signals for these readings. For SATNAV, see that the mate is able to set up the receiver to obtain the vessel's position on the next usable satellite pass.

Automatic Radar Plotting Aid (ARPA)

(2) Automatic Radar Plotting Aid (ARPA). Ensure that each vessel over 10,000 gross tons is equipped with an ARPA as required by the Port and Tanker Safety Act and the Navigation Safety Regulations. Take the time to spot targets on the screen and to follow a vessel's movement across the screen.

Echo Depth Sounder and Recorder

(3) Echo Depth Sounder and Recorder. Energize the equipment to see if it gives a reading. The recorder will show recent performance if it was operational as the vessel entered the harbor.

Marine Radar

(4) Marine Radar. Energize the radar and note targets moving across the screen or pick out shore objects on the radar if possible. Check both radars on vessels over 10,000 gross tons, including true north stabilization features.

Vessel FM Radio

(5) Vessel FM Radio. Ensure that the vessel has the capability to use VHF Channels 13, 16 and 22 and that the radios are in working order. A radio check is not necessary unless you suspect that the radios do not work.

Magnetic Steering Compass

(6) Magnetic Steering Compass. Check to see if there is a current deviation table posted near the magnetic compass. The table should be derived from swinging the vessel and there should be a comparison log showing entries of the differences between the vessel's true, gyro and magnetic north compass readings. The magnetic compass can vary depending on the type of cargo loaded and it may show differences from voyage to voyage. Check the emergency steering compass periscope, if fitted, to ensure that you can see the card. Check compass illumination.

Gyrocompass

(7) Gyrocompass. Check the reading on the steering gyrocompass against the repeaters on the bridge wings, the second steering station and the steering engine room. Be sure to ask if the gyro is energized as they are sometimes secured during an extended port stay. Look at the comparison log for any fluctuations between the gyro, magnetic and true readings.

Rudder Angle Indicator

(8) Rudder Angle Indicator. Check the rudder angle indicator in all locations such as main steering station, bridge wings, and emergency steering station. They should all have the same reading. A few degrees variance is acceptable.

Charts

(9) Charts. Check charts of the areas to be transited within the COTP zone to see if they are maintained up-to-date. Use a list of the most recent Defense Mapping Agency (DMA) notice to mariners changes to verify that a chart is corrected up-to-date. Foreign charts are acceptable if they contain similar information and are of a large enough scale to permit safe navigation. NVIC 9-83 provides additional guidance regarding application of the requirements for carriage of charts. Electronic charts are not an acceptable substitute for paper charts.

Publications

(10) Publications. Vessels must carry a currently corrected copy of, or applicable currently corrected extract from, the U.S. navigation publications (or foreign equivalents) listed in 33 CFR 164.33. Further enforcement guidance is provided in NVIC 9-83. Publications required include:

(a) U.S. Coast Pilot.

(b) Coast Guard Light List.

(c) Tide Tables.

(d) Tidal Current Tables or River Current Publication.

Relative Motion Plotting Equipment

(11) Relative Motion Plotting Equipment. While the ARPA may do some of the relative motion plotting for the vessel personnel, the vessel still must have equipment for manual plotting of relative motion. Normally this equipment consists of maneuvering boards, triangles, parallel rules, etc.

During reexaminations, conduct a brief check of the bridge and navigation spaces for compliance with selected items from the Navigation Safety Regulations (33 CFR 164). Do not check the entire list of navigation safety requirements or conduct operational testing of the equipment unless "clear grounds" exist to doubt the vessel's compliance with the navigation safety regulations. Normally, a check of three or four of the items listed above is sufficient.

ILO 147

b. ILO 147. During annual examinations and reexaminations, be alert for especially hazardous or unsanitary conditions. We cannot hold other countries to the same standards we expect here in the U.S. However, we should be alert to those conditions that are blatantly unsafe. Labor or pay complaints should be brought to the attention of the Department of Labor by contacting G-MOC. Where intervention authority is lacking, local humanitarian or religious organizations (i.e. Seamen's Friends Society) may be able to assist in correcting unsanitary practices or in assisting crewmembers. See COMDINST 16711.12 for further guidance.

Structural Integrity

c. Structural Integrity. During annual examinations and reexaminations, look for evidence of long term neglect, wastage, corrosion, cracking, pitting or casualty damage. The presence on deck of plating, sections of piping, or an excessive number of oxyacetylene tanks may indicate unauthorized repairs or other problems. Look for recent burn marks from welding particularly on the reverse slope plates of the upper wing tanks if possible. Temporary repairs including cement boxes, epoxy patches, postage stamp inserts and drill stopped cracks may indicate problems. Each situation must be evaluated to determine whether the temporary repair is adequate or whether the vessel should be detained until permanent repairs are made.

Cargo Operations

d. Cargo Operations. During annual examinations and reexaminations, check the following:

General

(1) General.

(a) Check containers and packaged cargo for proper marking, labeling, and placarding;

(b) Look for damaged or leaking cargo containers and packages, particularly forklift punctures or crushing that would indicate dropped packages;

(c) Look for potential ignition sources, particularly from electrical equipment, smoking violations, stowage plan and cargo segregation;

(d) Determine if the vessel has a capacity to retain all oily waste and oily bilge slops generated while operating in U.S. waters; and

(e) Check to see that no oil or hazardous material is carried in prohibited spaces.

(f) As of December 31, 1997 Administration approved Cargo Securing Manuals (CSM's) became mandatory under SOLAS 74, Ch. VI/5 and VII/6 for all cargo vessels engaged in international trade which are equipped with cargo securing systems or individual cargo securing arrangements. Checks of foreign flag cargo vessels for CSM's, approved by the appropriate flag Administration or by organizations designated by the flag Administration, shall become a routine part of port State control examinations. NVIC 10-97 provides more amplifying information on CSM's.

Foreign flag cargo vessels found to not have an Administration approved CSM will be required to provide a CSM prior to the next U.S. voyage. For vessels with dangerous goods/hazardous materials cargoes already aboard, CG PSCO's will evaluate the vessels securing arrangements for the dangerous goods/hazardous materials cargoes. In cases where the dangerous goods/hazardous materials cargo securing is found insufficient, appropriate corrective action will be required as a condition for departure.

For foreign flag vessels that return to U.S. ports without CSM's on subsequent voyages, more restrictive actions may be necessary, to include:

(i) Detention of the vessel until the vessel's owner or operator formally establishes a reasonable timeline for submittal of a CSM to the cognizant Administration or authorized representative,

(ii) Notification of the cognizant Administration and classification society that the vessel is in violation of SOLAS 74, Ch. VI/5 and VII/6, and

(iii) Prevention of future cargo operations at all U.S. ports until the vessel owner or operator provides proof of compliance with SOLAS 74, Ch. VI/5 and VII/6 CSM requirements.

On Deck

(2) On Deck.

(a) Note the general condition of the fuel piping systems (including manifolds), particularly any non-permanent repairs and other irregularities;

(b) Check the materiel condition of the fuel vents; (note: there is no requirement for fuel tank vent screens on foreign vessels)

(c) Examine closure mechanisms for cargo hatches, sideports, watertight doors and other openings that maintain the seaworthy condition of the vessel; and

(d) Ensure that stowage and securing arrangements for on deck containers are adequate and that cargo segregation is in compliance with 49 CFR 176.83.

Lifesaving Equipment Check

e. Lifesaving Equipment Check. During annual examinations and reexaminations, spot-check the vessel's lifesaving equipment. Observe the condition of the lifeboats paying particular attention to the hull and davits. Liferaft stowage and missing weak links are common problems that can usually be corrected quickly without detaining the vessel. See D5.C.7.h. for guidance on abandon ship drills.

Firefighting Equipment Check

f. Firefighting Equipment Check. During annual examinations and reexaminations, review the vessel's fire control plan and note the adequacy and condition of firefighting equipment. Check the fire stations to ensure that there are hoses, extinguishers, fixed CO2 systems, and other firefighting equipment on the vessel as indicated in the fire control plan and/or general arrangement plan. Examine the fire detection and sprinkler systems if applicable. During annual examinations, test the fire main and pumps by charging the system and witnessing the pressure at widely separated deck stations simultaneously. Do not spend the time to look at every station, but ensure the vessel's readiness to respond to a fire. Determine if international shore connections are provided where required.

Pollution Prevention Equipment Check

g. Pollution Prevention Equipment Check. During annual examinations and reexaminations, check for compliance with the Pollution Prevention Regulations (33 CFR 155, 156 and 159) and MARPOL Regulations (Annexes I, II and V) [See 33 CFR 151 and COMDTINST M16450.30 for further guidance]. During annual examinations, this should be an in-depth look at the vessel pollution prevention requirements including examination of fuel and lubricating oil systems, waste oil handling systems, oil or liquid hazardous material transfer procedures (as applicable), garbage handling procedures, declarations of inspection, and marine sanitation devices. At a minimum, the following should be examined:

NOTE: These items applicable only to vessels carrying oil or liquid hazardous material as cargo (i.e., in deep tanks) or engaged in bunkering.

On Deck

(1) On Deck.

(a) Look at the small discharge containment and visually check the capacity. Have someone demonstrate the mechanical means of closing scuppers and drains in the containment, and look for the means of draining or removing discharged product from the containment;

(b) Look at the fuel and bulk lubricating oil discharge containment and visually check the capacity (i.e., 1/2 barrel 300-1600 gross tons, 1 barrel over 1600 gross tons, 5 U.S. gallon portable container for 100-300 gross tons and 100 gross tons or over constructed before July 1974);

(c) Sight the bilge slops piping outlet (1,600 gross tons and above, on each side of the weather deck; below 1,600 gross tons, accessible from the weather deck) and make sure the vessel has a means to stop each discharge on the weather deck near the discharge outlet;

(d) Ensure vessel meets requirements for ballast discharge if it ballasts fuel tanks;

(e) Locate the emergency shutdown system and, if possible, have it activated to ensure proper operation;

(f) Check the vessel's required transfer communications (continuous two-way voice between persons-in-charge of the transfer operation) and ensure that they are intrinsically safe;

(g) Visually inspect required deck lighting at the transfer point and transfer operation work area;

(h) The minimum design burst pressure for each hose assembly must be at least four times the sum of the pressure of the relief valve setting (or four times the maximum pump pressure when no relief valve is installed) plus the static head pressure of the transfer system, at the point where the hose is installed.

The maximum allowable working pressure (MAWP) for each hose assembly must be more than the sum of the pressure of the relief valve setting (or the maximum pump pressure when no relief valve is installed) plus the static head pressure of the transfer system, at the point where the hose is installed.

(i) Check to see each hose is marked with the required information; and

(j) Sight the "Discharge of Plastic and Garbage Prohibited" placard.

Engine Room

(2) In Engine Room.

(a) Sight the oil-water separator and check the certification label for a Coast Guard approval number or International Maritime Organization (IMO) specification label (MARPOL 73/78);

(b) Check the bilge continuous monitor for an approval number or IMO specification label and sight the recording tape;

(c) Check and operationally test the discharge alarm system;

(d) Sight the "Discharge of Oil Prohibited" placard required to be in each machinery space, bilge, and ballast pump control station;

(e) Verify that the vessel is equipped with an operable, U.S. Coast Guard or MARPOL IV certified marine sanitation device (MSD); and

(f) Check the bilges for presence of oil or hazardous material.

(g) Confirm structural integrity of ER bilges.

In Cargo Control Area

(3) In Cargo Control Area.

(a) Verify that the vessel has a list of designated persons-in-charge for each type of transfer operation (fueling and each product).

(b) Examine in depth the bulk liquid transfer procedures. Ensure that:

- They are legibly printed in a language understood by personnel engaged in the transfer operations;
- They are permanently posted or available where they can easily be seen and used by crewmembers;
- There is a list of each oil or liquid hazardous material transferred (generic name, product information, applicability of transfer procedures);
- There is an accurate description of each transfer system on the vessel (including a line diagram, the location of the shutoff valves, description of and procedures for emptying the discharge containment system);
- The number of persons required to be on duty for transfer is indicated with the duties, by title, of each person required for each transfer operation;
- There are procedures and duty assignments for tending the vessels moorings during transfer;
- There are procedures for operating the emergency shutdown and transfer communications, topping off tanks, ensuring that all valves used during the transfer operation are closed on completion of the operation, and reporting fuel or cargo discharges;
- Any exemptions or alternatives granted are located in the front of the transfer procedures; and
- Any amendments have been incorporated.

(c) Confirm that the emergency shutdown is operable from the cargo control area for bulk liquid transfer operations.

Abandon Ship Drill

h. Abandon Ship Drill. An abandon ship drill is to be witnessed by the boarding team during annual examinations.

i. Conducting the drill: Muster crew at their stations. Check muster lists for accuracy. Check that lifejackets are properly donned. Determine if crew members are able to communicate with each other. Ensure that crewmembers are familiar with abandon ship procedures/duties and the proper use of ship's lifesaving equipment. Lower lifeboats, where practicable, to the embarkation deck. Conduct general examination of davits, falls, sheaves, etc. as boat is being prepared and lowered to the embarkation deck. Start lifeboat engines. Lowering of lifeboats into the water, releasing them and exercising the crew is **not** required. If the marine inspector or boarding officer feels the crew is unfamiliar with their duties or incapable of safely operating the lifesaving equipment, then the drill should be halted and the Master told to conduct training and/or additional exercises. The USCG should be recalled when they are ready to conduct a drill. During follow-up exam, inspectors/boarding officers may have crew lower boats into the water, release them and exercise crew, when practicable, to ensure competency of crew. Drills are determined unsatisfactory when language barriers interfere with adequate verbal communication, or when the competency of the crew is so inadequate that the drill can not be executed safely.

Fire Drill

i. Fire Drill. A fire drill is to be witnessed by the boarding team during annual examinations. The ability of the crew to respond to emergencies is witnessed during the drill. All crewmembers should participate except for those engaged in cargo operations or on watch in machinery spaces. One suggested method of conducting the fire drill is to choose a specific location in the vessel (cabin, paint locker, storage room, etc.) for a simulated fire.

Conducting the Drill

(1) Conducting the Drill. Have a crewmember go to the location and activate the manual fire alarm system. Observe the alarm indication on the fire alarm panel and the responses of the vessel's officers. A normal procedure is to send an officer or fire patrolman to investigate. Go to the location and describe the fire situation (smoke, flames, etc.) to the investigator. Observe how the report of fire is relayed to the bridge or damage control center. At this point most vessels will sound the crew alarm to summon the firefighting parties and the remainder of the crew to their stations. Observe the firefighting party arriving on scene, breaking out their equipment and fighting the simulated fire. Team leaders should be giving orders as appropriate to their crews and passing word back to the bridge or damage control center on the conditions. The firefighting crews should be observed for proper donning and use of their equipment. Make sure that all of the gear is compatible; e.g., the breathing apparatus can be worn with the protective suit, the helmet can be worn with the air mask, and the lifeline can be attached to breathing apparatus

or belt. Merely mustering the emergency crews with their gear is NOT acceptable.

Steering

j. Steering. Steering gear failures on all classes of foreign vessels have caused serious marine casualties and pollution incidents in U.S. waters. The steering system shall be tested at annual exams by a marine inspector. The tests should include the following:

(1) Operationally check the main and auxiliary steering from each remote steering gear control system and each steering position on the navigating bridge;

(2) Test the main steering gear from the emergency power supply;

(3) Check the reading on the bridge gyrocompass against the repeater in the after steering room;

(4) Check the rudder angle indicator in the after steering room, it should have the same reading as the indicator on the bridge;

(5) Test each remote steering gear control system power failure alarm and each steering gear power unit failure alarm;

(6) Test for full movement of the rudder according to the required capabilities of the steering gear;

(7) Test the means of communication between the navigating bridge and the steering gear compartment;

(8) Visually inspect the steering gear and its connecting linkage; and

(9) Check for indications of potential failures involving excessive leakage of hydraulic fluid; looseness in connections, fasteners, or couplings; frayed electrical wiring or evidence of arcing; unusual noises during operation; or evidence of insufficient maintenance. Examples of the latter include jury-rigged repairs, painted over lube fittings, and deficient maintenance that might adversely affect operation of the steering gear.

8. Expanded Examination

During any annual examination, reexamination, or deficiency follow-up, the boarding team should expand their examination of a vessel if their examination establishes "clear grounds" for believing that the condition of a vessel, its equipment, or crew do not correspond substantially with the particulars of the certificates. Expanded examinations should focus on those areas where "clear grounds" have been established and should not include other areas or systems unless the general impressions or observations of the boarding team support such examination.

D. MONITORS

Monitors should occur in conjunction with either an annual examination, reexamination or deficiency check whenever cargo, bunkering or lightering operations are occurring concurrently with the boarding. We should not board vessels for the purpose of conducting a monitor unless we also intend to conduct either an annual examination, reexamination or deficiency check. Generally the examination or reexamination should commence first with the examination of documents. However, if the transfer is in progress when you arrive, you may want to start with the monitor, particularly if the transfer is near completion.

1. Bulk Liquid Monitor

If a bulk liquid transfer is in progress, meet the person-in-charge and observe the cargo (or bunker) transfer operation (See MSM II-D6.D.1 of this volume).

2. Dry Cargo Monitor

Observe the transfer of hazardous materials and walk through the vessel to check for compliance with the packaged or solid bulk hazardous material handling requirements. When walking through the vessel, spot check for the hazardous materials noted during the DCM check. At a minimum, the following should be examined:

On Deck

a. On Deck.

(1) Observe the cargo handling equipment and procedures to ensure that cargo is properly secured and is not damaged during transfer;

(2) Ensure that only acceptable hazardous materials are loaded or carried on board;

(3) Check containers and packaged cargo for proper marking, labeling, and placarding;

(4) Look for damaged or leaking cargo containers and packages; and

(5) Look for smoking and hot work violations.

In Holds

b. In Holds. When possible, go into open holds. However, if the hatch is being worked, do not stop the loading operation unless you see or have reason to suspect a violation.

(1) Ensure that the hold is clean and dry;

(2) Check bilges for cargo residue;

(3) Check containers and packaged cargo for proper marking, labeling, and placarding;

(4) Look for damaged or leaking cargo containers and packages;

(5) Check for proper stowage and segregation of hazardous materials for compliance with 49 CFR 176.83;

(6) Note any inoperative or faulty cargo handling equipment; and

(7) Where flammable or combustible liquids are handled, ensure that electrical fixtures are explosion proof and only approved power operated industrial trucks are used.

E. CARGO SUPERVISION

Supervision of explosives or radioactive materials transfers follows the same general procedures as a freighter or container ship monitor with the following additional requirements:

1. Boarding Team Presence

The boarding team must be present during the entire transfer from beginning to end.

2. Special Requirements

Special requirements for the cargo carried must be enforced. For vessels carrying military and commercial explosives, 49 CFR 176, Subpart G, must be adhered to. Further guidance is contained in Chapter 29.E. of this volume. For vessels carrying highway route controlled quantities of radioactive material, 49 CFR 173, Subpart I, and 49 CFR 176, Subpart M, must be adhered to. Further guidance is contained in MSM II-F5.C.5. of this volume.

F. CLOSING THE BOARDING

Advise the master of all discrepancies noted, what corrective actions are required, and when those actions must be completed. The decision to impose operational controls should be made by the COTP except in cases of imminent danger. The boarding team should be prepared to make appropriate recommendations to the COTP regarding the actions to be taken on deficiencies. If the discrepancies make the vessel unsafe to proceed to sea, or an unreasonable risk to the environment, the COTP should detain the vessel under the provisions of the appropriate international convention, a COTP order, or a customs hold as appropriate. Discrepancies which do not make a vessel unsafe to proceed to sea, or an unreasonable risk to the environment, should be handled by requiring corrective measures to be accomplished within a specified time frame or prior to returning to the U.S. If time permits, assist in correcting simple problems (such as transfer

procedures or maneuvering information) while on scene. Give the master (or mate) sufficient guidance to correct any outstanding problems. Provide the master a written record of the boarding that includes a listing of all discrepancies and the corrective actions required. If the vessel is detained, provide the master with a copy of the Detention Report (MSM II-D2, Annex A). The Detention Report should list only those deficiencies that must be corrected prior to departure.

G. POST-BOARDING ACTIONS

As you depart the vessel, watch for any signs of pollution around the vessel and the facility (or other vessels) and any other unsafe situations. A brief monitor of the shoreside part of the operation should also be conducted before leaving the area for your next assignment or returning to the unit. After arriving at the unit, enter all information into the MSIS, including vessel file updates, boarding report (PSAR), discrepancy reports, and operational controls. For the benefit of other MSO's, enter case information as soon as possible after return to the unit. In all cases, MSIS should be updated within 48 hours of completing the boarding. If the vessel is detained, follow the procedures in Chapter 24 of this volume for documenting the detention.

1. Marine Safety Information System (MSIS)

All cargo vessel examinations will be documented in MSIS by filing a Port Safety Activity Report (PSAR). To ensure the accuracy of the database used in making boarding decisions:

a. The code "AEF" will be used to document all annual freight vessel examinations.

b. The code "DOCK" will be used to document all freight vessel reexaminations. This code will only be used when a physical boarding is performed. (Those units that update document data based on electronically provided information may use the code "INV NEC" when filling a PSAR to record that activity.)

c. The codes "PHM" (Monitor Packaged Hazardous Material), "MSD" (Monitor Ship Dangerous Cargo), "MSO" (Monitor Ship Oil) or ""MBL" (Monitor Blasting Agent/Oxidizer) will be used to document all freight vessel monitors as applicable. These codes will NOT be used alone, but should be used in conjunction with either the "AEF" or "DOCK" codes.

d. The codes "CSC" (Commercial Explosives), "CSM" (Military Explosives) or "CSR" (Radioactive) will be used to document all freight vessel cargo supervisions as applicable. These codes will NOT be used alone, but should be used in conjunction with either the "AEF" or "DOCK" codes.

e. The code "MAR" (MARPOL General) shall be included as an activity type on all boardings. Estimate the time spent by the boarding office checking MARPOL related items and enter it under the "ACTIVITY" column after

"MARPOL GEN". Do not include marine inspector time.

f. Until a change can be made to the PSAR, the "PERS" column will be used to record the number of "ACTIVITY" work hours spent by marine inspectors on foreign freight vessels. All work hours will be rounded to the nearest tenth of an hour with the exception of marine inspector "ACTIVITY" hours, which will be rounded to the nearest hour. Marine inspector preparatory time, travel time, administrative time and time on board should be included under the "PERS" column.

g. No distinction needs to be made between marine inspector and port safety boarding officer training hours. These hours will be combined under the applicable "TRAINING" column.

h. The certificate codes "NON" (none) will be used for all freight vessel annual examinations and reexaminations.

i. Outstanding discrepancies and any significant discrepancies corrected during the boarding must be entered in the Port Safety Discrepancy Report (PSDR) product set.

j. Update the Vessel File Involved Party (VFIP) product set if different from that observed aboard the vessel. If a vessel's classification society is not listed or differs from that shown in VFIP, enter the appropriate classification society using the Involved Party Numbers (IPN) listed in MSM II-D4.B.3. The "OWNER" indicated in the VFIP should match that indicated on the vessel's registry. The "OPERATOR" indicated in the VFIP should match that indicated on the vessel's Certificate of Financial Responsibility (COFR). If the vessel is ISM certified ensure that the Document of Compliance company name is entered as owner or operator.

k. The Vessel File List of Documents (VFLD) product set should be updated to reflect the status of the vessel's documents.

l. MSIS entries including deficiencies are to be entered into MSIS within 48 hours of completing a boarding.

m. If a vessel is expected to arrive within another OCMI/COTP's zone of responsibility before MSIS can be updated, information regarding the boarding and any deficiencies or control action taken shall be relayed to the next port of call in the most expedient means available, (e.g. facsimile, telephone, E-mail etc.).

Figure D5-1 is an example of a completed PSAR for an annual freight vessel examination including a monitor conducted by a qualified marine inspector, boarding officer and a marine inspector (or boarding officer) trainee completed in 4 hours.

FIGURE D5-1

PSAR PORT SAFETY ACTIVITY REPORT 02JAN98

CASE NUMBER/ PS95000002 PORT/ G-MOC ACTIVITY DATE/ 01JAN98 REF CASE/

CARGO: NAME/ CONTAINERS TYPE/ NON HAZARDOUS MATERIAL.
OPERATION / OFFLOADING NEC DESC/ _____.
LOCATION / CITY, STATE _____.
_____.
BOARD TIME / 0830 HIGH PRIORITY?/ Y TEAM LEADER INITS/ JJS
CERT ACTION/ NONE VALIDATE/ X CLOSE TO FILE/ .
COMMENTS / COMPETED ANNUAL FREIGHT SHIP EXAMINATION.
_____
_____
_____
_____

SEL ---ACTIONS REPORTED ---
1 NUMBER OF DISCREPENCIES……. / __ OUT?/ N LEGAL ACTIONS?/N
2 VPI NOTICE……. /
3 OPERATIONAL CONTROL IMPOSED……/
4 NARRATIVE SUPPLEMENT……... /
5 NUMBER OF DEFICIENCY SUMMARIES /

VESSELS INVOLVED:
V/K VIN NAME FLAG SERVICE
V L7117117 RUSTY BUCKET MT FREIGHT SHIP .
#DIS/ _ OUT?/ _ LEG.ACT?/ _ LPC/ HONDO NPC/ HOUMS
ACTIVITY TYPE(S)/ ANNUAL SHIP MON PH HAZMAT MARPOL GEN _____.
_____ _____ _____ _____.

----------TOTAL TIME SPENT PER ACTIVITY----------
------REGULAR------- -------RESERVE--------

SUBJ	ACTIVITY TYPE	ACTIVITY	TRAIN	PERS	ACTIVITY	TRAIN	PERS	BOAT	AIRCRAFT
VI	ANNUAL SHIP	2.0	3.0	7					.
VI	MON PH HAZMAT	1.0							.
VI	MARPOL GEN	1.0	1.0	1					.
__									.
__									.

ADMIN/ 3.0 ADMIN/ _____
TRAV/ 4.0 TRAV/ _____

CHAPTER 6: PROCEDURES APPLICABLE TO FOREIGN TANK VESSELS

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A. GENERAL PROVISIONS

Under Coast Guard policy set forth in the "M" Business Plan (COMDTINST 16000.26) and as required by 46 U.S.C. 3714, each foreign tank vessel shall undergo a full safety examination at its initial U.S. port of call and at least annually thereafter. This annual examination is referred to as a Tank Vessel Exam (TVE). 46 U. S. C. 3711 requires the Coast Guard to issue a Letter of Compliance to each foreign tank vessel that is valid for 24 months. The Coast Guard has determined that a TVE letter will be issued to tank vessels carrying oil and oil products every 12 months and a Letter of Compliance (LOC) will be issued to chemical and gas carriers every 24 months with an annual mid-period exam. Reexaminations shall be conducted in accordance with the Targeting Procedures in MSM II-D4.

B. COMPLIANCE WITH U.S. REGULATIONS

In addition to the Pollution Prevention Regulations (33 Code of Federal Regulations (CFR) parts 151, 155-157, and 159); the Navigation Safety Regulations (33 CFR 164); and the Bulk Liquid, Liquefied Gas, or Compressed Gas Hazardous Materials Regulations (46 CFR 153-154), foreign tank vessels operating in U.S. waters must comply with 46 CFR 35.01-1 and the cargo venting and handling system requirements in 46 CFR 35.30 and 35.35. Title 46 CFR 30.01-5(e)(2) also requires foreign flag tank vessels operating in U.S. waters to comply with 46 CFR 32.53 Inert Gas Systems, 46 CFR 34-05-5(a)(2) Foam Systems, and 46 CFR Part 39 Vapor Control Systems. For additional guidance on the application of 33 CFR 157, refer to Navigation Vessel Inspection Circular (NVIC) 10-94.

1. Inert Gas Systems (IGS)

The IGS requirement in 46 CFR 32.53-1 applies to all existing (46 USC 3701) foreign flag crude oil tankers and new product carriers. Liquefied gas carriers and vessels that carry ONLY grade E cargo at or below a temperature lower than 5 degrees Celsius below its flash point are exempted.

a. Existing product tankers between 20,000 and 40,000 deadweight tons (DWT) are not required to have IGS unless tank washing machines with a capacity of more than 60 cubic meters per hour (high capacity tank washing machines) are installed. Because of differing application dates, the Coast Guard initially assumed that a foreign tanker that carried only products in U.S. trade was a product tanker. Now that all applicability dates are past, closer attention should be given to identification of foreign vessels as crude oil or product tankers under 46 CFR 32.53. The Form B supplement to the International Oil Pollution Prevention Convention (IOPP) Certificate should be consulted to verify that tankers carrying products without IGS are designated as product tankers only.

b. Both U.S. regulations and international conventions permit exemptions from the inert gas requirements for existing crude tankers less that 40,000 DWT not fitted with high capacity tank washing machines. Only Commandant (G-MSO) can grant exemptions for foreign flag vessels operating in U.S. waters. For foreign vessels, flag state exemptions must be submitted with a request for a U.S. exemption. To date, no exemptions have been granted for vessels operating in U.S. waters. The intent is to assure that IGS are installed on foreign tank vessels to the same degree that they would be installed on U.S. tank vessels.

c. IGS on foreign vessels are usually built to International Convention for the Safety of Life at Sea (SOLAS) Regulation II-2/62 rather than U.S. regulations. It is not the intent that IGS on foreign vessels meet every detail of 46 CFR 32.53-10 through 32.53-85. IGS meeting SOLAS Regulation II-2/62 should be accepted on foreign tank vessels as equivalent to U.S. regulations. Inspection of IGS to verify compliance with either SOLAS or U.S. regulations should be conducted as part of the annual examination or biennial Letter of Compliance (LOC) examination.

2. Vapor Control Systems (VCS)

To transfer vapors of a flammable or combustible cargo with a facility regulated under Title 33 CFR Part 154, a vessel's Letter of Compliance (LOC) must be endorsed by a Coast Guard Marine Safety Office stating the VCS is approved by the Marine Safety Center under 46 CFR Part 39 (see 46 CFR 39.10-13(e)). Details on how the LOC endorsement is obtained are in 46 CFR 39.10-13(d). Certification by the flag state or classification society may be presented to the Officer in Charge, Marine Inspection (OCMI) to obtain the LOC endorsement; the certification must include the following items for which the VCS was evaluated.

a. Vessel identification (name, classification or official number, call sign, flag).

b. A statement that the vessel's vapor control system was reviewed and meets the requirements of 46 CFR Part 39.

c. A statement that the inert gas manual has been amended in accordance with 46 CFR 32.53-85(b), if applicable.

d. A statement that the oil transfer procedures has been amended in accordance with 33 CFR 155.750(d).

e. The cargo tanks to which the certification applies.

f. The maximum allowable liquid transfer rate (cubic meters per hour).

g. The maximum allowable vapor density.

h. A list of cargoes for which the VCS was reviewed.

NOTE: The U.S. Coast Guard has not reviewed all the cargoes being shipped in bulk for VCS requirements. The current list of cargoes that have been assigned a VCS category may be obtained by contacting the Marine Safety Center.

3. Foam Systems

The requirement for foam systems in 46 CFR 34-05-5(a)(2) are applicable to new foreign flag tankers of 20,000 DWT and over. "New" is defined in 46 U.S.C. 3701. No other section of 46 CFR 34.05 specifically applies to foreign vessels.

a. The intent of 46 CFR 30.01-5(e)(2) is to require deck foam systems on new foreign tankers in U.S. trade. Such a foam system should meet the details of SOLAS, not U.S. regulations.

b. The foam concentrate should be suitable for the cargoes carried. Water miscible products, such as many alcohols, ketones, esters, ethers, amines, aldehydes, acids, and anhydrides tend to destroy regular foam by dissolving the water from the foam blanket. For these products, special "polar solvent" or "alcohol" foams must be used. Manufacturers' literature on the foam concentrate should be requested if there is any question on compatibility.

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4 Oil-Bulk-Ore (OBO) Vessel Change of Status; Conversion to a Non-Tank Vessel

The definition of "tank vessel" in 46 U.S.C. 2101(39) includes all vessels which are constructed or adapted to carry, or that carry, oil or hazardous material in bulk as cargo or cargo residue. Therefore, any vessel, including an Oil-Bulk-Ore (OBO) vessel, which is constructed or adapted to carry oil or hazardous materials in bulk as cargo, is considered a tank vessel even if it does not carry oil or hazardous material when trading in the U.S. For business reasons, owners of these types of vessels may wish to remove the vessel from tank vessel status.

Vessel Change of Status

a. Vessel Change of Status. Following the decision to remove a vessel from the bulk oil or hazardous material trade, the vessel's owner should:

(1) Request from its classification society or flag state that its IOPP Certificate, along with the Form A Supplement, be reissued to indicate that the vessel does not carry oil in bulk as cargo.

(2) Apply to the Coast Guard National Pollution Funds Center if the owner desires to have the Certificate of Financial Responsibility (COFR) revised to reflect non-tank vessel status.

Enforcement Action

b. Enforcement Action. During examinations and reexaminations, the boarding team shall verify the vessel's documents properly indicate the "non-tank vessel" status. They shall update the Marine Safety Information System (MSIS) Vessel File List of Documents (VFLD) to indicate the change in status from a tank vessel to non-tank vessel.

(1) If a vessel's certificates indicate "non-tank vessel" status, but cargo oil or hazardous materials are found to be carried in bulk on board, the vessel will not be allowed to transfer cargo oil. The vessel is in violation of its IOPP Certificate and shall be detained until enforcement actions are completed as provided in Volume I, Chapter 4.I.1.e of this manual. Additionally, enforcement actions shall be initiated pursuant to a COFR violation as provided in Volume I, Chapter 4.I.1.d. of this manual.

5. High-Velocity Pressure/ Vacuum (P/V) Valves

For high- velocity P/V valves installed aboard foreign tankers, the requirements of 46 CFR 162.017-3(n) have been interpreted to allow this type of valve without a flame screen on the pressure discharge side. A foreign vessel must have evidence of acceptance of such installed valves, both from its flag administration and a recognized classification society, available on board for examination. The valves shall be properly maintained and in good, serviceable condition at all times. They are acceptable because:

a. High vapor velocities in the pressure discharge piping preclude the passage of flame, thus making the flame screen unnecessary; and

b. Installation of a flame screen would defeat the purpose of a high velocity P/V valve by retarding the flow of vapor to the atmosphere.

NOTE: All other openings to atmosphere on such valves must have flame screens as prescribed in the regulations. There is no relaxation of the flame screen requirement for P/V valves that are not of the high-velocity type.

C. CONDUCTING TANK VESSEL EXAMINATIONS

1. Scheduling

Using the targeting procedures described in MSM II-D4, Officers in Charge, Marine Inspection (OCMI), or Captains of the Port (COTP) shall identify high priority vessels entering their zones. After identifying those vessels to be boarded, the examinations will be scheduled using the MSIS Port Safety Vessel Scheduler (PSVS) product set and a boarding team will be assigned. Boarding teams assigned to conduct Priority I boardings, annual Tank Vessel Exams (TVE) or biennial LOC exams shall include a senior marine inspector. Other boarding teams should include a marine inspector if resources permit. Teams should also be scheduled to monitor cargo transfers if resources permit.

Annual Examinations of Letter of Compliance Vessels

a. Annual Examinations of Letter of Compliance Vessels. Chemical tankers are issued a LOC valid for two years with an annual mid-period examination required to be conducted after 1 year. There is no requirement that owners or operators request the required examinations. The law places the responsibility for initiating this examination upon the Coast Guard. However, for scheduling purposes, it is in the vessel's owner/operator's best interest to schedule a required examination at least 7 days in advance. Upon receiving the required advance notice of arrival from a LOC vessel, the OCMI/COTP must check the status of the vessel's documents and boarding history to ensure that a TVE, if due, is carried out. The annual safety examinations of LOC vessels should coincide with the initial and biennial examinations for an LOC with cargo endorsement, when these are necessary.

Tank Vessel Exams and Letter of Compliance Exams

b. Tank Vessel Exams and Letter of Compliance Exams (see 46 CFR 2.01-6 for regulatory definitions). 46 USC 3714 requires foreign oil and chemical tank vessels, as defined in 46 USC 2101, to undergo annual examinations. Under the targeted boarding program, tankers overdue for an annual TVE or biennial LOC are Priority II boardings. To avoid delays to cargo operations, tanker owners often request an examination prior to the expiration date of their TVE or LOC. In some cases, these requests have been denied due to Coast Guard resource constraints and the tanker's operations subsequently delayed on the next voyage because the TVE or LOC was expired. To avoid delays, the Officer in Charge Marine Inspection (OCMI) or COTP is encouraged to complete TVEs and LOCs when requested within three months of their expiration date. At the discretion of, and with the prior approval from, the local OCMI/COTP, tankers with expired TVEs or LOCs (renewal or midperiod) that are not more than three months past due, and with no indications that the vessel is not in compliance with applicable laws and regulations, should not be restricted from commencing cargo operations prior to an examination. However, the TVE or LOC must be completed prior to departure. Vessels that are more than three months beyond the due date of their TVE or LOC will continue to be boarded prior to commencement of cargo operations. Vessel owners, operators and agents are required by 46 CFR 153.809(a) or 46 CFR 154.150(b) to provide an advance notice of arrival at least 7 days in advance, to advise the OCMI/COTP that the vessel is due for either a TVE or an LOC.

Advance Notice of Arrival from LOC Vessels

c. Advance Notice of Arrival from LOC Vessels (33 CFR 160.201, 160.211). Vessels should provide an advance notice of arrival prior to entering each U.S. port. If the vessel departs one U.S. port and enters another, an advance notice is required, even if the ports are in the same COTP zone. The MSIS data on all LOC vessels entering port and carrying bulk dangerous cargoes should be checked to ascertain the validity of its LOC and any International Maritime Organizations (IMO) certificates. The Vessel File List of Documents (VFLD) product set lists the vessel's current IMO Certificate of Fitness (COF),LOC (and Subchapter O Endorsement if applicable), and the relevant expiration dates. If a particular vessel does not appear in MSIS, contact the Marine Safety Center to determine the vessel's status. The vessel's ISM certificates should also be verified.

Marine Chemist Certification of Confined Spaces

d. Marine Chemist Certification of Confined Spaces. During annual examinations and biennial LOC examinations, entry into pump rooms may be anticipated as a normal aspect of the examination. For vessels carrying Subchapter O products or Subchapter D products with an established Threshold Limit Value (TLV), a Marine Chemist Certificate is required prior to entering the pump room. A marine chemist certificate is required prior to entering the ballast tank of any tanker. To minimize delays and ensure the safety of boarding personnel, the OCMI/COTP should ensure the vessel's master, agent or owner is advised as soon as possible after receiving an advance notice of arrival that a Marine Chemist Certificate will be required prior to entry of Coast Guard personnel into these spaces. Guidance on confined space entry may be found in Volume I, Chapter 10, of this manual.

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2. Pre-Boarding Preparations Prior to arrival at the vessel, the boarding team must review the available MSIS data and regulations to determine the required examination activities for the boarding. Refer to NVIC 10-94 for guidance on double hull requirements (33 CFR 157). Extract the basic vessel information from the MSIS history for use during the visit to the vessel (including: name, flag, call sign, tonnage, build date, boarding history, recent spills, outstanding discrepancies, status of certificates and documents, etc). MSIS may indicate that certain information must be confirmed or updated during the boarding to keep MSIS records current. It may also indicate outstanding discrepancies that should be checked.

MSIS Data for LOC Tank Vessels

a. MSIS Data for LOC Tank Vessels. MSIS Data on LOC tankers should be checked in the following product sets prior to the boarding:

(1) VFLD. For all liquefied gas carriers and non-signatory chemical carriers, the Marine Safety Center will enter the issue and expiration dates of IMO Certificates and addenda, which have been accepted and will load the Subchapter O Endorsement (SOE) in MSIS. The date which the Marine Safety Center loaded the SOE is used as the issue date in VFLD, and the status is marked as "AMENDED." For signatory chemical carriers, a port office may enter the issue and expiration dates of IMO certificates and addenda; note that these vessels are not issued a SOE.

NOTE: Only the Marine Safety Center is authorized to make VFLD entries for IMO Certificates of Fitness.

(2) MISOE. Port offices can access a vessel's Subchapter O Endorsement using the retrieve function and the vessel's VIN (-MISOE, R, VIN=L0000000).

(3) CTVIS. The Marine Safety Center has developed a document called the "Chemical Tank Vessel Information Sheet." This document includes much of the general information and guidance that had been included in the previously required SOE document, and serves as a means for the Coast Guard to communicate with foreign chemical tank vessel owners and operators. Although not required, it is highly recommended this document be kept on board a foreign chemical tank vessel for reference and informational purposes. The CTVIS may be accessed from MSIS in the same manner as the SOE using the retrieve function and a generic VIN (-MISOE,R,VIN=CG050741) or via the internet by linking to it through the MSC homepage at www.uscg.mil/hq/msc.

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3. Approaching the Vessel

As you approach the vessel, look for the following:

a. Cargo transfer operations;

b. The general condition of the facility (or other vessel) adjacent to the vessel being boarded;

c. Evidence of hot work in the vicinity of the transfer;

d. A red flag or red light, and warning signs;

e. The general condition of the vessel;

f. The location of the vessel's load line (if the vessel is trim and the load line mark is submerged, the OCMI or COTP should be notified);

g. The vessel's draft readings;

h. Evidence of cargo leaks or pollution;

i. Suitability of the moorings and the gangway for the tide, current, and weather conditions expected during the transfer period; and

j. General evidence of unsafe conditions.

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4. Boarding the Vessel

Upon boarding the vessel, identify yourself as a representative of the U.S. Coast Guard, Marine Safety Office, Marine Safety Activity, Marine Inspection Office, or Captain of the Port Office, as appropriate, and ask to see the master or chief mate (or the senior deck officer on duty). Introduce yourself and advise that the purpose of this visit is to conduct either an annual TVE, biennial LOC examination or a mid-period.

a. When conducting a TVE or LOC examination, advise the master that the examination will consist of a document check, a general examination, operational testing of specific equipment (i.e. steering, firemain, and navigation equipment as a minimum) and emergency drills. If applicable it may also include a follow-up on any outstanding discrepancies.

b. When conducting a mid-period, advise the master that the examination will consist of a document check and a general examination as a minimum. If applicable it may also include a follow-up on any outstanding discrepancies.

In either event, ensure that the master understands that the boarding team reserves the right to expand the examination if "clear grounds" are established to doubt the validity of the vessel's certificates (See MSM II-D1.K.). Supplemental check off sheets are provided for use during annual examinations and biennial LOC examinations aboard vessels equipped with an IGS or Vapor Containment System (VCS). When completing the checkoff lists, make adequate notes and comments so that all discrepancies noted are easily understood by reviewing officials, vessel personnel and the hearing officer (if a violation report is filed). Remember that the checkoff list is intended as a job-aide, not a "cook book". The depth and scope of the examination must be determined by the boarding team based on their observations. A satisfactory check may be accomplished simply by sighting a piece of equipment in some cases, while in others it may be necessary to look, question or test more closely.

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5. Examination of Documents Sight and review pertinent vessel documents, certificates, and officers' licenses. Make sure they are current. Determine whether the vessel's hull, deck, internal structure, cargo hatches, piping or required equipment has been damaged or undergone repair since the last Coast Guard examination. Also determine whether any outstanding conditions of class exist. If available, review the outstanding conditions of class. Check to see if the vessel is overdue for drydocking or repair.

If after boarding it is determined from records aboard a vessel that the vessel is not due for an examination, or that the vessel's boarding priority is lower than MSIS records indicate, advise the vessel's officer that you will limit your examination to a less extensive reexamination. Do not leave the vessel without at least completing a cursory document check and a general "walk through" examination to ensure no obvious deficiencies exist.

The document check should include the following as appropriate:	
❑ Certificate of Registry	❑ Log Entries
❑ Classification Society Certificate	❑ Cargo Information Cards
❑ IGS, COW, SBT, CBT Operations Manuals	❑ Safety Construction Certificate
❑ IGS, COW, SBT, CBT Approval Letters	❑ Safety Equipment Certificate
❑ IGS Record Book	❑ Safety Radiotelegraphy Certificate
❑ Oil Record Book	❑ Cargo Record Book
❑ Safety Radiotelephone Certificate	❑ Shipboard Oil Pollution Emergency Plan
❑ Load Line Certificate	❑ Oil Transfer Procedures
❑ International Oil Pollution Prevention Certificate or equivalent	❑ Letter of Compliance Card w/Sub O Endorsement
❑ Records of Hose &. Piping Tests	❑ Tonnage Certificate
❑ Certificate of Financial Responsibility	❑ Approved Procedures & Arrangements Manual
❑ Safe Manning Document	❑ Officers' Licenses
❑ Vessel crew list	❑ Cargo Location Plan
❑ Cargo Manifest	❑ Safety Management Certificate
❑ Document of Compliance	❑ IMO Certificate of Fitness
❑ Garbage Management Plan	❑ International NLS Certificate

IOPP Certificate

a. IOPP Certificate. Review the IOPP Certificate. Ensure that for countries which are not signatory to the International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 (MARPOL 73/78), the equivalent documentation is Coast Guard acceptable. Check the Oil Record Book to ensure that it has been maintained properly. Navigation Vessel Inspection Circulars (NVIC) 8-83 and 9-86 provide additional guidance for MARPOL 73/78 enforcement.

Safe Manning Document

b. Safe Manning Document. SOLAS, Chapter V, Regulation 13, requires all ships of 500 gross tons and more on international voyages to be issued a safe manning document. This document is to state what the flag state administration considers to be the minimum complement necessary to ensure the vessel is sufficiently and efficiently manned from the point of view of safety. There is no standard format for a safe manning document, though some guidance on the elements to be included in the document can be found in IMO Resolution A.481(XII), Annex 1, and guidance to be taken into account in determining safe manning can be found in Annex 2 of that IMO resolution. However, there are no specific manning scales which can be considered as an internationally agreed standard for assessing the adequacy of the crew complement on a seagoing ship. Therefore, the boarding team must use good judgement in questioning a flag state's determination of the adequacy of a vessel's manning level.

(1) Every foreign flag vessel of 500 gross tons or more visiting a U.S. port should have on board a safe manning document issued by the vessel's flag state administration. If the document is in a foreign language, an English translation is to be available. The document should contain the following information:

(a) Identification of the ship;

(b) A table showing the numbers and grades of personnel required to be carried, together with any special conditions or limitations based on the particulars of the ship or the nature of the service upon which it is engaged; and

(c) The date of issue and expiration along with a signature for and the seal of the administration.

(2) In the event a safe manning document is available, the flag state is a party to SOLAS, the information in the document is complete, and the required crew complement is consistent with normal expectations for a ship of its size and service, no further action is required with respect to the manning document itself. Attention must then be directed to determining that the crew is appropriately certificated under the STCW convention (as discussed below).

NOTE: For tankers, the provisions of 33 CFR 164.13 concerning manned engine rooms and two licensed officers on the bridge will be relevant to a determination of whether the vessel is properly manned. Additionally, when promulgated, the regulations implementing the provisions of 46 U.S.C. 9101(a) will also be relevant.

c. International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended in 1995 (STCW 95). Refer to the guidance in Ch. D.5.C.6.c of this Volume for guidance.

d. Document Checks Aboard LOC Vessels. At each TVE, biennial LOC examination and mid-period of a LOC vessel check the following:

(1) Examine the LOC card and the attached Subchapter O Endorsement (for liquefied gas carriers and non-signatory chemical carriers);

(2) Ascertain that any IMO Certificates listed in the Subchapter O Endorsement (for liquefied gas carriers and non-signatory chemical carriers) are on board the vessel and are valid;

(3) Check the LOC Examination Record for outstanding deficiencies;

(4) Check the cargo manifest against the cargoes authorized by the IMO Certificate of Fitness and/or the Subchapter O Endorsement (for liquefied gas carriers and non-signatory chemical carriers). The Subchapter O Endorsement will refer to the list of cargoes contained in the IMO Certificate of Fitness and may restrict carriage of certain listed cargoes.

(5) Ensure that any special operating instructions listed in the Subchapter O Endorsement or the IMO Certificate are being observed;

(6) Check the cargo manifest and tank arrangement (or the cargo location plan, if available) for compatibility of adjacent cargoes or cargoes in tanks joined by common piping or vent headers. Cargoes must be stowed in accordance with 46 CFR 150, Subpart A - Compatibility of Cargoes. If the master claims an authorized exception to the compatibility chart, he or she must produce a copy of the letter or message from the Coast Guard granting the exception as required by 46 CFR 150.160; and

(7) Determine if the foam, dry chemical, or carbon dioxide firefighting systems have been serviced within the last 2 years.

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6. General Examination

During annual TVE, biennial LOC examinations, and mid-periods, conduct a general "walk through" examination of the vessel. The general examination should include observation of required equipment on deck, in the engine room, and in after steering. Verify the adequacy, maintenance, and operation of firefighting, pollution prevention, and other equipment required by regulations. Look for obvious safety problems.

Navigation Safety Equipment Check

a. Navigation Safety Equipment Check. During annual TVE examinations, biennial LOC examinations, and mid-periods, ask if all equipment was working properly during the last voyage. If equipment is not working, determine when repairs will be made. If a major piece of electronic equipment (like the radar or Automatic Radar Plotting Aid (ARPA)) is not operational, the OCMI/COTP should be contacted for instructions.

➔ Conduct a thorough check of the bridge and navigation spaces for compliance with the Navigation Safety Regulations (33 CFR 164). Meet with the second mate, if available, and ask to have the electronic equipment energized if cargo operations permit.

SAFETY NOTE: Energizing Equipment During Cargo Operations Could Pose A Safety Hazard.

➔ Check the complete list of navigation safety items, paying special attention to the extra requirements for vessels over 10,000 gross tons. Check or test the equipment paying particular attention to the following:

Position Fixing Device

(1) Position Fixing Device (LORAN C, Satellite Navigation System (SATNAV) or GPS). Energize the equipment. Check that the receiver is able to lock on and track the signals for these readings. For SATNAV, see that the mate is able to set up the receiver to obtain the vessel's position on the next usable satellite pass.

Automatic Radar Plotting Aid (ARPA)

(1) Automatic Radar Plotting Aid (ARPA). Ensure that each vessel over 10,000 gross tons is equipped with an ARPA as required by 33 CFR 164.37. Take the time to spot targets on the screen and to follow a vessel's movement across the screen.

Echo Depth Sounder and Recorder

(3) Echo Depth Sounder and Recorder. Energize the equipment to see if it gives a reading. The recorder will show recent performance if it was operational as the vessel entered the harbor.

Marine Radar

(4) Marine Radar. Energize the radar and note targets moving across the screen or pick out shore objects on the radar if possible. Check both radars on vessels over 10,000 gross tons, including true north stabilization features.

Vessel FM Radio

(5) Vessel FM Radio. Ensure that the vessel has the capability to use VHF Channels 13, 16 and 22 and that the radios are in working order. A radio check is not necessary unless you suspect that the radios do not work.

Magnetic Steering Compass

(6) Magnetic Steering Compass. Check to see if there is a deviation table posted near the magnetic compass. The table should be derived from swinging the vessel and there should be a comparison log showing entries of the differences between the vessel's true, gyro and magnetic north compass readings. The magnetic compass can vary depending on the type of cargo loaded and it may show differences from voyage to voyage. Check the emergency steering compass periscope, if fitted, to ensure that you can see the card. Check compass illumination.

Gyrocompass

(7) Gyrocompass. Check the reading on the steering gyrocompass against the repeaters on the bridge wings, the second steering station and the steering engine room. Be sure to ask if the gyro is energized as they are sometimes secured during an extended port stay. Look at the comparison log for any fluctuations between the gyro, magnetic and true readings.

Rudder Angle Indicator

(8) Rudder Angle Indicator. Check the rudder angle indicator in all locations such as main steering station, bridge wings, and emergency steering station. They should all have the same reading.

Charts

(9) Charts. Check charts of the areas to be transited within the COTP zone to see if they are maintained up-to-date. Use a list of the most recent Defense Mapping Agency (DMA) notice to mariners changes to verify that a chart is corrected up-to-date. Foreign charts are acceptable if they contain similar information and are of a large enough scale to permit safe navigation. NVIC 9-83 provides additional guidance regarding application of the requirements for carriage of charts.

Publications

(10) Publications. Vessels must carry a currently corrected copy of, or applicable currently corrected extract from, the U.S. navigation publications (or foreign equivalents) listed in 33 CFR 164.33. Further enforcement guidance is provided in NVIC 9-83. Publications required include:

(a) U.S. Coast Pilot.

(b) Coast Guard Light List.

(c) Tide Tables.

(d) Tidal Current Tables or River Current Publication.

Relative Motion Plotting Equipment

(11) Relative Motion Plotting Equipment. While the ARPA may do some of the relative motion plotting for the vessel personnel, the vessel still must have equipment for manual plotting of relative motion. Normally this equipment consists of maneuvering boards, triangles, parallel rules, etc.

INSPECTION GUIDANCE: During mid-periods, conduct a brief check of the bridge and navigation spaces for compliance with selected items from the Navigation Safety Regulations (33 CFR 164). Do not check the entire list of navigation safety requirements or conduct operational testing of the equipment unless "clear grounds" exist to doubt the vessel's compliance with the navigation safety regulations. Normally, a check of three or four of the items listed above is sufficient.

ILO 147

b. ILO 147. During TVE, biennial LOC examinations, and mid-periods, be alert for especially hazardous or unsanitary conditions. We cannot hold other countries to the same standards we expect here in the U.S. However, we should be alert to those conditions that are blatantly unsafe. Labor or pay complaints should be brought to the attention of the Department of Labor by contacting G-MOC. Where intervention authority is lacking, local humanitarian or religious organizations (i.e. Seamen's Church Society) may be able to assist in correcting unsanitary practices or in assisting crewmembers. See COMDINST 16711.12 for further guidance.

Structural Integrity

c. Structural Integrity. During annual TVE examinations, biennial LOC examinations, and mid-periods, look for evidence of long term neglect, wastage, corrosion, cracking, pitting or casualty damage. The presence on deck of plating, sections of piping, or an excessive number of oxyacetylene tanks may indicate unauthorized repairs or other problems. Look for recent burn marks from welding. Temporary repairs including cement boxes, epoxy patches, postage stamp inserts and drill stopped cracks may indicate problems. Each situation must be evaluated to determine whether the temporary repair is adequate or whether the vessel should be detained until permanent repairs are made.

Oil Tankers Over 10 Years Old

(1) Oil Tankers Over 10 Years Old. 46 USC 3714 (a)(2) requires the Coast Guard to assess the structural integrity of the hull of all tankers over 10 years of age. To satisfy this statutory requirement on foreign oil tankers in this age category, marine inspectors have been required to enter a ballast tank during the annual examination since MVI policy letter 25-90 went into effect. Examination of ballast tanks during TVE's by USCG personnel is no longer mandatory. The annual examination will still endeavor to determine the vessel's overall structural condition and assess the quality of the vessel's maintenance program. In addition, senior marine inspectors will review the most recent copy of the classification society's status report (conditions of class), dry dock survey reports and other class society surveys as appropriate. This new policy applies to all foreign oil tankers. Under no circumstances should ballast tanks be entered on LNG, LPG or chemical tankers.

Verification Examination of Structural Integrity

(2) Verification Examination of Structural Integrity. 46 USC 3714 (a)(2) comes from the Port and Tanker Safety Act of 1978. It is specific in identifying tankers over 10 years old as requiring an assessment of structural integrity. The Act does not specify the manner in which the assessment is to be carried out. MVI policy letter 25-90 made entry into ballast tanks mandatory due to the poor performance of other parties of the safety net in this regard. In recent years, this trend has significantly decreased, as the performance of class societies has vastly improved. The number of tank vessel detentions has decreased. The value of entering ballast tanks during a port State control examination is questionable. The marine chemist testing of the atmosphere and brief visual evaluation does not mitigate the physical hazards of coatings or muck, nor does it remove the biologic growth exposure risk.

IMO Resolution A.744(18)

(3) IMO Resolution A.744(18) recommends owners and operators of single-hull tank vessels to initiate an enhanced survey program (ESP) at the next scheduled dry-dock examination occurring on or after November 27, 1996. These requirements can be found in 33 CFR 157.430. Reports of structural surveys, condition evaluation reports, thickness measurement reports, and survey planning documents, if available, should be reviewed during the annual examination to assess the structural integrity of the hull.

46 USC 3714(a)(2)

(4) In order to comply with the provisions of 46 USC 3714(a)(2), every effort shall be made to verify the structural integrity of the vessel by external examination. This shall include deck, sideshell, external piping; visual checks through tank openings and pump room condition and the condition of other spaces. In the event that entry into a ballast tank is deemed necessary, OCMI's should arrange for a joint tank entry with the classification society. Proper confined space entry procedures should be followed. Shipping agents should be responsible for the attendance of a marine chemist to test and certify the tank as "safe for workers" prior to the entry of Coast Guard personnel

Senior marine inspectors (SMI) will comply with Volume I, Chapter 10, of this manual during all ballast tank entry examinations. If possible, the SMI should request the marine chemist to note if testing indicated any presence of hydrocarbon in tanks tested. This information is valuable because it may indicate if a structural problem exists which has led to leaking from cargo tanks into adjoining ballast tanks. In addition, inspectors will normally request that a vessel representative attend the ballast tank examination. Most marine chemists will require that continuous forced ventilation of fresh air be maintained in the tank from the time of certification until the conclusion of all tank entries. Inspectors should verify that this and any other stipulations on the marine chemist's certificate have been followed prior to their entry into the tank. Depending on the circumstances, inspectors may require that additional measures be provided by the vessel during tank entry such as having vessel crewmen standing by the tank entrance with a lifeline, rescue harness and/or self-contained breathing apparatus.

(5) In all cases where significant structural problems are detected, the vessel's classification society should be notified. In addition, control action may be initiated as discussed in Chapter D2 of this volume. The OCMI/COTP should remain involved until the problem is resolved. If the vessel is permitted to depart port to make repairs overseas, written confirmation for the repairs from the classification society and/or flag administration will normally be required before the vessel is allowed to return to U.S. ports. Vessels of Particular Interest (VPI) entries in MSIS are to be used to identify vessels that have outstanding structural deficiencies.

Lifesaving Equipment Check

d. Lifesaving Equipment Check. During annual TVE, biennial LOC examinations, and mid-periods, spot-check the vessel's lifesaving equipment. Observe the condition of the lifeboats paying particular attention to the hull and davits. Liferaft stowage and missing weak links are common problems which can usually be corrected quickly without detaining the vessel.

Firefighting Equipment Check

e. Firefighting Equipment Check. During annual TVE, biennial LOC examinations, and mid-periods, review the vessel's fire control plan and note the adequacy and condition of firefighting equipment. Check the fire stations to ensure that there are hoses, extinguishers, fixed CO2 systems, and other firefighting equipment on the vessel as indicated in the fire control plan and/or general arrangement plan. Examine the fire detection and sprinkler systems if applicable. During annual examinations, test the fire main and pumps by charging the system and witnessing the pressure at widely separated deck stations simultaneously. Do not spend the time to look at every station, but ensure the vessel's readiness to respond to a fire. Determine if international shore connections are provided where required.

Cargo Operations

f. Cargo Operations. During annual TVE, biennial LOC examinations and mid-periods, check the following:

(1) On Deck.

(a) Note the general condition of the cargo piping system and the manifolds, checking for non-permanent repairs and other irregularities;

(b) Check the materiel condition of the vent system, cargo handling system, VCS (if installed) and IGS (if required);

(c) Look for open cargo hatches, Butterworth plates, ullage openings, and vents, making sure flame screens are installed or the openings are supervised;
and

(d) Examine all closure mechanisms for cargo tank hatches, ullage openings, sounding ports, tank cleaning openings and any other openings that maintain the seaworthy condition of the vessel.

Pollution Prevention Equipment Check

g. Pollution Prevention Equipment Check. During annual TVE, biennial LOC examinations, and mid-periods, conduct a thorough check for compliance with the Pollution Prevention Regulations (33 CFR 155, 156 and 159), Tank Vessel Regulations (33 CFR 157), and MARPOL Regulations (Annexes I, II and V) [See 33 CFR 151 and COMDTINST M16450.30 for further guidance]. During annual examinations and biennial LOC examinations, this should be an in-depth look at the vessel pollution prevention requirements including examination of SBT, CBT, IGS, tank cleaning systems, crude oil washing (COW) system, cargo transfer systems, fuel and lubricating oil systems, waste oil and noxious liquid substances (NLS) handling systems, transfer procedures, garbage handling procedures, declarations of inspection, and marine sanitation devices. The following items should be examined:

On Deck

(1) On Deck.

(a) Look at the cargo small discharge containment and visually check the capacity. Have someone demonstrate the mechanical means of closing scuppers and drains in the containment, and look for the means of draining or removing discharged product from the containment;

(b) Look at the fuel and bulk lubricating oil discharge containment and visually check the capacity (i.e., 1/2 barrel 300-1600 gross tons, 1 barrel over 1600 gross tons, 5 U.S. gallon portable container for 100-300 gross tons and 100 gross tons or over constructed before July 1974);

(c) Sight the bilge slops piping outlet (1,600 gross tons and above, on each side of the weather deck; below 1,600 gross tons, accessible from the weather deck) and make sure the vessel has a means on the weather deck near the discharge outlet to stop each discharge;

(d) Verify that the vessel meets requirements for ballast discharge if it ballasts fuel tanks;

(e) Locate the emergency shutdown system and, if possible, have it activated to ensure proper operation;

(f) Check the vessel's required transfer communications (continuous two-way voice between persons-in-charge of the transfer operation) and ensure that they are intrinsically safe;

(g) Visually inspect required deck lighting at the transfer point and transfer operation work area;

(h) The minimum design burst pressure for each hose assembly must be at least four times the sum of the pressure of the relief valve setting (or four times the maximum pump pressure when no relief valve is installed) plus the static head pressure of the transfer system, at the point where the hose is installed.

The maximum allowable working pressure (MAWP) for each hose assembly must be more than the sum of the pressure of the relief valve setting (or the maximum pump pressure when no relief valve is installed) plus the static head pressure of the transfer system, at the point where the hose is installed;

(i) Verify that each hose is marked with the required information;

(j) Note if vessel security is maintained; and

(k) Sight the required "Discharge of Plastic and Garbage Prohibited" placard.

Engine Room

(2) In Engine Room.

(a) Sight the oil-water separator and check the certification label for a Coast Guard approval number or IMO specification label (MARPOL 73/78);

(b) Check the bilge continuous monitor for an approval number or IMO specification label and sight the recording tape;

(c) Check and operationally test the discharge alarm system;

(d) Sight the "Discharge of Oil Prohibited" placard required to be in each machinery space, bilge and ballast pump control station;

(e) Verify that the vessel is equipped with an operable U.S. Coast Guard or MARPOL IV certified marine sanitation device (MSD); and

(f) Check the bilges for presence of oil or hazardous material.

Cargo Control Area

(3) In Cargo Control Area.

(a) Verify that the vessel has a list of designated persons-in-charge for each type of transfer operation (fueling and each product).

(b) Examine in depth the transfer procedures. Ensure that:

- They are legibly printed in a language understood by personnel engaged in the transfer operations;
- They are permanently posted or available where they can be easily seen and used by crewmembers;
- There is a list of each product transferred (generic name, cargo information, applicability of transfer procedures);
- There is an accurate description of each transfer system on the vessel (including a line diagram, the location of the shutoff valves, description of and procedures for emptying the discharge containment system);
- There is an accurate description of each vapor control system installed on the vessel;
- The number of persons required to be on duty for transfer is indicated with the duties, by title, of each person required for each transfer operation;

- There are procedures and duty assignments for tending the vessel's moorings during transfer;
- There are procedures for operating the emergency shutdown and transfer communications, topping off tanks, ensuring that all valves used during the transfer operation are closed on completion of the operation, and reporting fuel or cargo discharges;
- Any exemptions or alternatives granted are located in the front of the transfer procedures; and
- Any amendments have been incorporated.

(c) Confirm that the emergency shutdown is operable from the cargo control area.

(d) Confirm that the IGS functions properly.

General

(4) General.

(a) Look for potential spark/ignition sources, particularly from electrical equipment;

(b) Determine if the vessel has a capacity to retain all oily waste and oily bilge slops generated while operating in U.S. waters; and

(c) Check to see that no oil or hazardous material is carried in prohibited spaces.

In Pumproom

(5) In Pumproom.

CAUTION – SAFETY NOTICE: Prior to Entry into a Pumproom, Ensure that the Space is Certified "SAFE FOR WORKERS" by a Marine Chemist if the vessel is Carrying any Subchapter O products or Subchapter D products that have an established TLV!

(a) Ensure that the ventilation system is properly operating (should operate a minimum of 15 minutes prior to entry);

(b) Check for potential sources of ignition and fire hazards in or near the pump room, including oil or hazardous material in bilges, excessive vapors, rags, paint, cleaning solvents, unsealed bulkhead penetrations or openings, etc.;

(c) Look for loose wiring and use of drop cords and other electrical sources of ignition (lighting fixtures and electrical appliances should be explosion proof); and

(d) Check pumps for leaking oil (other than gland lubrication) or hazardous material.

Abandon Ship Drill

h. Abandon Ship Drill. An abandon ship drill is to be witnessed by the boarding team during annual examinations. Refer to the guidance provided in Chapter 5.C.7.h.

Fire Drill

i. Fire Drill. A fire drill is to be witnessed by the boarding team during annual examinations. The ability of the crew to respond to emergencies is witnessed during the drill. All crewmembers should participate except for those engaged in cargo operations or on watch in machinery spaces. One suggested method of conducting the fire drill is to choose a specific location in the vessel (cabin, paint locker, storage room, etc.) for a simulated fire.

Conducting the Drill

(1) Conducting the Drill. Have a crewmember go to the location and activate the manual fire alarm system. Observe the alarm indication on the fire alarm panel and the responses of the vessel's officers. A normal procedure is to send an officer or fire patrolman to investigate. Go to location and describe the fire indication (smoke, flames, etc.) to the investigator. Observe how the report of fire is relayed to the bridge or damage control center. At this point most vessels will sound the crew alarm to summon the firefighting parties and the remainder of the crew to their stations. Observe the firefighting party arriving on scene, breaking out their equipment and fighting the simulated fire. Team leaders should be giving orders as appropriate to their crews and passing word back to the bridge or damage control center on the conditions. The firefighting crews should be observed for proper donning and use of their equipment. Make sure that all of the gear is compatible; e.g., the breathing apparatus can be worn with the protective suit, the helmet can be worn with the air mask and the lifeline can be attached to breathing apparatus or belt. *Merely mustering the emergency crews with their gear is NOT acceptable.*

Steering

j. Steering. Steering gear failures on all classes of foreign vessels have caused serious marine casualties and pollution incidents in U.S. waters. The steering system shall be tested annually by a marine inspector. The tests should include the following:

(1) Operationally check the main and auxiliary steering from each remote steering gear control system and each steering position on the navigating bridge;

(2) Test the main steering gear from the emergency power supply;

(3) Check the reading on the bridge gyrocompass against the repeater on the after steering room;

(4) Check the rudder angle indicator in the after steering room, it should have the same reading as the indicator on the bridge;

(5) Test each remote steering gear control system power failure alarm and each steering gear power unit failure alarm;

(6) Check for full movement of the rudder according to the required capabilities of the steering gear;

(7) Test operation of the means of communication between the navigating bridge and the steering gear compartment;

(8) Visually inspect the steering gear and its connecting linkage; and

(9) Check for indications of potential failures involving excessive leakage of hydraulic fluid; looseness in connections, fasteners, or couplings; frayed electrical wiring or evidence of arcing; unusual noises during operation; or evidence of insufficient maintenance. Examples of the latter include jury-rigged repairs, painted over lube fittings, and deficient maintenance that might adversely affect operation of the steering gear.

Emergency Towing Arrangements

k. Emergency Towing Arrangements. SOLAS V/15-1 requires all tankers of 20,000 DWT and above to have an emergency towing arrangement fitted at both ends of the vessel. The design and construction shall be approved by the flag Administration.

7. Expanded Examination

During any annual TVE, biennial LOC examination, mid-period or deficiency follow-up, the boarding team should expand their examination of a vessel if their examination establishes "clear grounds" for believing that the condition of a vessel, its equipment, or crew do not correspond substantially with the particulars of the certificates. Expanded examinations should focus on those areas where "clear grounds" have been established and should not include other areas or systems unless the general impressions or observations of the boarding team support such examination.

D. MONITORS

Monitors should occur in conjunction with either an annual TVE, biennial LOC examination, mid-period or deficiency check whenever cargo, bunkering or lightering operations are occurring concurrently with the boarding. We should not board vessels for the purpose of conducting a monitor unless we also intend to conduct either an annual examination, biennial LOC examination, reexamination or deficiency check. Generally the examination or reexamination should commence first with the examination of documents. However, if the transfer is in progress when you arrive, you may want to start with the monitor, particularly if the transfer is near completion.

1. Procedures for Conducting a Bulk Liquid Monitor

If a bulk liquid transfer is in progress, meet the person-in-charge and observe the cargo (or bunker) transfer operation. Concentrate on procedures, personnel training, and other human factors that influence the transfer operation. Boarding teams must be careful to avoid possible acute exposure to vapors during cargo operations, especially around vents and ullages. Team members should always have an escape route in mind in case of an emergency. At a minimum, the boarding team shall do the following:

In Cargo Control Area

a. In Cargo Control Area.

(1) Determine the current status of the transfer operation. Ensure that the person-in-charge is at the transfer site or immediately available and has a copy of the vessel's transfer procedures;

(2) Review the vessel's transfer procedures and spot check to see if they meet the requirements of 33 CFR 155.750. For example, see if the person-in-charge is on the person-in-charge list in the transfer procedures;

(3) Ensure that the product being transferred is listed in the transfer procedures product list;

(4) Determine if there are adequate communications between the persons-in-charge and that the means of communications is intrinsically safe;

(5) Ask to see the Declaration of Inspection for the transfer, note if it is completely filled out and signed by both persons-in-charge (vessel and facility or both vessels), and look into any items not properly completed or checked off on the Declaration of Inspection;

(6) Check to see if the transfer system is properly aligned to allow the flow of product and that unnecessary portions of the system are secured. Ensure that overboard discharge and sea suction valves are secured (except as required for ballast);

(7) Ensure that transfer limitations within the transfer procedures are not being violated (for example, if only two tanks are allowed to be loaded at the same time, no more than two tanks are being loaded); and

(8) Check to see that all persons required to be on duty for the transfer are at their required locations, awake, coherent, attentive, not under the influence of alcohol or drugs, and familiar with their duties.

On Deck

b. On Deck.

(1) Determine if the transfer hose in use is in good condition (no visible kinks, bulges, gouges, cuts, or other defects);

(2) Verify that a fixed hose connection (bolted, full threaded or accepted quick-connect coupling) or automatic back pressure shutoff nozzle is being used;

(3) Ensure that hoses and loading arms are long enough for the vessel to move within the limits of its moorings without causing a strain during the transfer;

(4) Ensure that the required discharge containment is in place. The fixed containment or drip pan should be clean (free of standing water or product) and have a means of draining or removing spilled cargo. [Note: It is not necessary to measure the containment unless obviously inadequate.];

(5) Verify that containment drains and deck scuppers are plugged;

(6) Ensure that flame screens in vents and in ullage holes are of the correct mesh and are not torn or blocked;

(6) Check open cargo hatches and ullage holes for proper supervision;

(7) Look for open flames, exposed wiring, welding, cutting, or other ignition sources;

(8) Ensure that the transfer area lighting is adequate (if required); and

(9) Check for availability of protective clothing and respirators when required under 46 CFR 153 and 46 CFR 154.

E. LETTER OF COMPLIANCE (LOC) AND CARGO ENDORSEMENT FOR FOREIGN CHEMICAL AND LIQUEFIED GAS TANK VESSELS

Title 46 U.S.C. 3711 requires a foreign vessel carrying a Subchapter O cargo to possess a LOC endorsed to allow carriage of that cargo. Until the new LOC form is developed, LOC Form CG-2832A shall be used. Vessels carrying cargoes regulated under 46 CFR Subchapter O, Parts 150 through 154 must comply with these laws. Chemical tank vessels are regulated under 46 CFR Part 153 and liquefied gas vessels under 46 CFR Part 154. The LOC card is issued by the OCMI after a satisfactory LOC examination of the vessel. A foreign chemical or liquefied gas tankship entering U.S. waters must have an IMO Certificate of Fitness (COF) on board. An IMO COF is issued by the flag state, usually through a classification society, and attests to compliance with the IMO Codes. The IMO COF includes a list of cargoes authorized to be carried by the flag administration. The LOC is endorsed to allow carriage of these cargoes in U.S. waters. For chemical tank vessels with an IMO COF issued by a flag state signatory to MARPOL 73/78, the OCMI's signature on the LOC card constitutes the cargo endorsement required by 46 U.S.C. 3711. For non-MARPOL signatory chemical vessels and all liquefied gas vessels, the cargo endorsement includes the OCMI's signature on the LOC card and a Subchapter O Endorsement (SOE). The SOE for these vessels will be loaded into MSIS by the Marine Safety Center and will be issued to the vessels by the OCMI upon satisfactory completion of the LOC exam. Questions, comments and information concerning the Subchapter O Endorsement should be directed to the Marine Safety Center.

1. Chemical Tank Vessels with Flag State Signatory to MARPOL 73/78

Application for a LOC and cargo endorsement under 46 CFR 153.9(a) is made directly to the cognizant OCMI. A review of the IMO COF by the Marine Safety Center prior to the OCMI's LOC examination is not necessary. The LOC will be valid for a period of two years as long as the vessel has a valid COF. The expiration date will not be affected by changes in the expiration date or reissuance of the IMO COF.

Evidence of Compliance

a. Evidence of Compliance. A valid IMO COF issued in accordance with the International Code for the Construction and Equipment of Ships Carrying, Dangerous Chemicals in Bulk (IBC Code) or the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code) (IMO Resolution A.212(VII), as amended) is accepted as evidence that the vessel is in compliance with international standards approximating Coast Guard regulations. The IBC Code applies to chemical vessels constructed on or after 1 July 1986 and the BCH Code applies to vessels constructed before this date. MARPOL 73/78 Annex II, Regulation 13, makes both the IBC Code or the BCH Code mandatory for chemical tank vessels. Because the IMO Codes are mandatory, compliance with either the IBC Code or the BCH Code, as applicable, will satisfy the requirements of 46 CFR 153 with the following exceptions:

(1) 46 CFR 153 Subpart C (Operations) applies to all foreign chemical vessels;

(2) 46 CFR 153.370, 153.371 and 153.438 applies to a foreign tank vessel transporting a cargo with a vapor pressure that exceeds 100 kPa absolute at 37.8 deg C (See 153.9(a)(2)); and

(3) 46 CFR 153.530(b), (d), and (p)(1) applies to a foreign tank vessel transporting alkylene oxides (See 153.9(a)(1)).

Cargo Endorsement

b. Cargo Endorsement. The signature of the OCMI on the LOC card will be the only endorsement necessary under 46 CFR 153.900 (a)(3). A separate SOE document for MARPOL signatory chemical tankships is not required. An IMO COF includes a list of cargoes authorized by the flag state to be carried under the SOLAS Convention. For a chemical cargo to be carried in U.S. waters, cargo carriage must be permitted by U.S. regulations (or tripartite agreement to which the U.S. is a party) and the cargo must be listed on the IMO COF. Separate documentation must be on board a vessel authorizing cargoes being carried under a tripartite agreement.

Chemical Tank Vessel Information Sheet (CTVIS)

c. Chemical Tank Vessel Information Sheet (CTVIS): The Marine Safety Center maintains a document called the "Chemical Tank Vessel Information Sheet." This document includes much of the general information and guidance that had been included in the previously required SOE document, and serves as a means for the Coast Guard to communicate with foreign chemical tank vessel owners and operators. Although not required, it is highly recommended this document be kept on board a foreign chemical tank vessel for reference and informational purposes.

MSIS NOTE: The CTVIS may be accessed from MSIS in the same manner as the SOE using the retrieve function and a generic VIN.
EXAMPLE: -MISOE,R,VIN=CG050741

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2. Liquefied Gas Tank Vessels and Chemical Tank Vessels with Flag State NOT Signatory to MARPOL 73/78

The Marine Safety Center reviews LOC endorsement applications for all foreign liquefied gas tank vessels and those chemical tank vessels whose flag state is not signatory to MARPOL 73/78. Applications for a Letter of Compliance with Subchapter O endorsement should be sent to: Marine Safety Center (MSC-3), 400 7th Street, SW, Washington DC 20590-0001. The following sections describe in detail the contents of the endorsement application:

- 46 CFR 153.9b "Non-signatory" chemical tank vessels("new" and "existing")
- 46 CFR 154.22 "New" liquefied gas tank vessels
- 46 CFR 154.12 "Existing" liquefied gas tank vessels and barges

Evidence of Compliance

a. Evidence of Compliance. As evidence that the vessel is in compliance with international standards approximating Coast Guard regulations, the Marine Safety Center accepts a valid IMO COF issued in accordance with one of the following:

(1) The Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH or IBC) (IMO Resolution A.212(VII), as amended);

(2) The Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IMO Resolution A.328(IX), as amended); or

(3) The Code for Existing Ships Carrying Liquefied Gases in Bulk (IMO Resolution A.329(IX)); or

(4) The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IMO Resolution MSC 5(48)).

The Marine Safety Center (MSC) performs plan review only on those chemical tankships whose flag administrations do not issue IMO COFs, on "existing" liquefied gas vessels constructed before the applicability criteria of 46 CFR 154, and on foreign unmanned barges for which no IMO Code presently exists.

Preparation of Subchapter O Endorsement

b. Preparation of Subchapter O Endorsement. After accepting the LOC endorsement application, the Marine Safety Center prepares an SOE and loads it into MSIS. This endorsement identifies the IMO COF and any addendum accepted by the Marine Safety Center, describes by reference the hazardous cargoes authorized for carriage in U.S. waters, and states any special restrictions imposed. The SOE must be signed and dated by an OCMI when it is issued and must be kept aboard the vessel**.** A new SOE will be prepared when the vessel receives a new or amended IMO COF or, in the case of plan review vessels, when the authorized cargo list or special restrictions are changed. The SOE is valid only when attached to a valid LOC card and only when the referenced IMO COF is on board. For a plan review vessel, the Marine Safety Center notifies the owner when plan review is complete and indicates the cargoes and applicable restrictions which will be included in the SOE.

3. Scheduling the Examination for a LOC with Cargo Endorse-ment

After the OCMI (for MARPOL signatory chemical tank vessels) or Marine Safety Center (all others) accepts a vessel's LOC endorsement application, the vessel's owner must request an examination. Procedures differ depending upon whether acceptance was based upon an IMO COF or Plan Review.

IMO Certificated Vessels

a. IMO Certificated Vessels. An owner of a vessel accepted on the basis of an IMO COF (46 CFR 153.9(a) or 154.22), requests an examination by following the procedures in 46 CFR 153.809 or 154.151. The owner sends notification directly to the OCMI at the vessel's first U.S. port of call at least 7 days prior to the vessel's arrival, indicating date of vessel's arrival; name of the port; agent's name and telephone number; and the names of any cargoes on board. The owner must ensure that the vessel plans identified in 46 CFR 153.809(b) or 154.151(b)(3) are available on board the vessel at the time of the examination. When an examination request is received directly from an owner, the OCMI should ensure that the vessel's application is based on IMO certification rather than plan review. To ensure that the application is complete and current, the OCMI should consult the MSIS VFLD product set. The VFLD product lists the IMO certificates and addenda accepted and the dates of validity, the issue date of the Subchapter O Endorsement (if one exists) and the issue and expiration dates of the LOC, if any. For a vessel whose application is either incomplete or not current, or for a vessel for which the MSIS information is unavailable, the OCMI should notify the Marine Safety Center immediately to determine the proper course of action. If review of MSIS indicates that all aspects of the vessel's endorsement application are in order, a place and time for the examination should be arranged.

Plan Review Vessels

b. Plan Review Vessels. An owner of a vessel accepted on the basis of Coast Guard plan review (i.e. a chemical tank vessel regulated under 46 CFR 153.9(b) or an "existing" liquefied gas tank vessel regulated under 46 CFR 154.12, requests an examination by notifying the Marine Safety Center 14 days prior to the vessel's arrival at a U.S. port. The Marine Safety Center notifies the cognizant OCMI of the examination request and forwards an "examination package" consisting of the vessel's plans, correspondence file, and completed Subchapter O Endorsement. Additional information concerning peculiar vessel characteristics, restrictions, or outstanding deficiencies from previous examinations may also be included. The final arrangements for the date and time of the examination are made by the OCMI directly with the vessel's local agent.

4. Procedures Applicable to Initial and Biennial Examinations of LOC Vessels

In addition to the procedures applicable to an annual tank vessel examination, the initial and biennial examination of LOC vessels should include the following:

a. If the Coast Guard accepted the vessel on the basis of plan review, the inspector should become familiar with the Subchapter O Endorsement, vessel plans, and other information provided by the Marine Safety Center, paying particular attention to any irregularities noted during plan review. Any questions should be resolved before the examination by contacting the Marine Safety Center. Particularly at the initial examination of a plan review vessel, the inspector should verify that the vessel is constructed and equipped in accordance with the accepted plans and applicable regulations.

b. To examine an IMO certificated vessel, the inspector should use the Subchapter O Endorsement (if applicable), IMO certificate, and plans available on board to verify that the vessel complies with the IMO Code under which the certificate is issued.

> **NOTE:** Vessels having IMO certificates may differ slightly from those governed by applicable Coast Guard regulations due to minor differences in interpretation of requirements by the flag administrations. Consult Coast Guard regulations implementing the IMO Codes or the Marine Safety Center if clarification of the intent of a particular IMO requirement is necessary.

c. For every vessel, the inspector should ensure that the vessel is operated in accordance with any special restrictions contained in the Subchapter O Endorsement and the IMO certificate, if applicable.

5. Procedures Applicable to Liquefied Gas Tank Vessels

During annual examinations, biennial examinations or reexaminations of such vessels, the inspector should check the following additional elements:

a. Operation of gas detection equipment and alarms;

b. Temperatures, pressures, and concentration of gas or oxygen in interstitial and/or hold spaces;

c. Seals and general condition of cargo tank relief valves;

d. Condition of firefighting equipment and systems;

e. Operation of quick - closing valves;

f. Cargo tank high - level alarms; and

g. Records of inert gas consumption on loaded voyages, if applicable.

6. Updating LOC Information

The vessel owner must notify the Marine Safety Center whenever name, registry, ownership, or operator changes occur. For a vessel accepted on the basis of an IMO COF, a change of registry invalidates the IMO certificate and therefore invalidates the Subchapter O Endorsement (if applicable) as well. The owner is responsible for submitting copies of amended or updated IMO certificates to the Marine Safety Center. The Marine Safety Center will contact the OCMI at the vessel's next port of call so that it can be boarded and current conditions noted as necessary. At the discretion of the OCMI, a new LOC card may be issued or "pen and ink" corrections made to the current card. If a new LOC card is issued, the expiration date from the previous LOC card shall be used. Make an entry in the "Remarks" column of the Examination Record to indicate the action taken. If a vessel representative requests an amendment to the content of the Subchapter O Endorsement, the OCMI should contact the Marine Safety Center.

7. Categories of Bulk Liquid Cargoes

Cargoes Which Have Been Evaluated

a. Cargoes Which Have Been Evaluated. Title 46 CFR Parts 153 and 154 include lists of those hazardous liquid cargoes considered to involve potential, unusual operating risks to life and property. A foreign vessel must have a properly endorsed LOC before it may carry the listed cargoes in U.S. ports. After evaluating a cargo for bulk carriage in self-propelled vessels, Commandant (G-MSO-3) places it in one of the following lists if bulk carriage will be permitted:

(1) 46 CFR 30.25-1: List of Flammable and Combustible Bulk Liquid Cargoes (Subchapter D)

(2) 46 CFR 153, Table 1: Bulk Liquid Hazardous Materials (Subchapter O)

(3) 46 CFR 154, Table 4: Bulk Liquefied Gases (Subchapter O).

Cargoes Which Have Not Been Evaluated

b. Cargoes Which Have Not Been Evaluated. In the event a shipper wishes to transport a cargo not included in one of these lists, Commandant (G-MSO-3) must be contacted for authorization (see 46 CFR 153.900(d) and 46 CFR 154.30). Coast Guard personnel finding a foreign vessel loading, discharging, or carrying cargoes which are not listed in or assigned to the lists referenced above, should notify the Marine Safety Center immediately. All inquiries regarding the classification of bulk liquid cargoes should be directed to Commandant (G-MSO-3).

Cargoes Too Hazardous For Bulk Carriage

c. Cargoes Too Hazardous For Bulk Carriage. Chemical cargoes that have been determined to be too hazardous to be carried in U.S. waters are:

(1) Acrolein;
(2) Chlorine (on self - propelled vessels);
(3) Ethylenimine;
(4) Hydrofluoric Acid;
(5) Hydrogen;
(6) Hydrogen Chloride;
(7) Hydrogen Fluoride;
(8) Methylcyclopentadienyl Manganese Tricarbonyl;
(9) Nitric Acid (in concentrations greater than 70 percent);
(10) Nitrogen Tetroxide;
(11) Oxygen;
(12) Phosphorus Trichloride; and
(13) (beta) Propiolactone.

F. CLOSING THE BOARDING

Advise the master of all discrepancies noted, what corrective actions are required, and when those actions must be completed. The decision to impose operational controls should be made by the OCMI/COTP except in cases of imminent danger. The boarding team should be prepared to make appropriate recommendations to the OCMI/COTP regarding the actions to be taken on deficiencies. If the discrepancies make the vessel unsafe to proceed to sea, or an unreasonable risk to the environment, the OCMI/COTP should detain the vessel or terminate cargo operations under the provisions of the appropriate international convention, a Captain of the Port order, or a customs hold as appropriate. Discrepancies which do not make a vessel unsafe to proceed to sea, or an unreasonable risk to the environment, should be handled by requiring corrective measures to be accomplished within a specified time frame or prior to returning to the U.S. If time permits, assist in correcting simple problems (such as transfer procedures or maneuvering information) while on scene. Give the master (or mate) sufficient guidance to correct any outstanding problems. Provide the master a written record of the boarding that includes a listing of all discrepancies and the corrective actions required. If the vessel is detained, provide the master with a copy of the Detention Report (Refer to MSM II-D2, Annex A). The Detention Report should list only those deficiencies that must be corrected prior to departure.

G. POST-BOARDING ACTIONS

As you depart the vessel, watch for any signs of pollution around the vessel and the facility (or other vessels) and any other unsafe situations. A brief monitor of the facility side of the operation should also be conducted before leaving the area for your next assignment or returning to the unit. After arriving at the unit, enter all information into the MSIS, including vessel file updates, boarding report, discrepancy reports, and operational controls. For the benefit of other MSO's, enter case information as soon as possible after return to the unit. In all cases, MSIS should be updated within 48 hours of completing a boarding. If the vessel is detained, follow the procedures in Chapter D2 of this volume for documenting the intervention.

1. Issuance of Tank Vessel Examination Letter (TVEL)

At the completion of the annual examination of a tank vessel, a TVEL, Form CG-840S-1 (with an attached Enclosure, Form CG-840S-2, when applicable) shall be issued to the vessel's master. A copy shall be sent to the owner/operator and another shall be retained by the issuing unit. This letter shall be issued with the endorsement, "A full tank vessel safety examination has been completed, as required by 46 U.S.C. 3714. The vessel is considered safe for the carriage of (grade of cargo)." The letter shall be issued for a period of one year, with the expiration date recorded on the letter.

Issuance of TVEL to LOC Vessels

a. Issuance of TVEL to LOC Vessels. A TVEL shall NOT be issued to a vessel which is issued a LOC. For such a vessel, the results of a biennial examination, mid-period or deficiency follow-up shall be entered in the Examination Record portion of LOC card. The grades of flammable or combustible cargo which the vessel is considered safe to carry shall be entered on the face of the LOC card in the space above the signature block. This endorsement should normally be made at annual examinations that coincide with initial and biennial examinations for issuance of a LOC.

2. Issuance of Letter of Compliance (LOC) with Cargo Endorsement

Until a new COC form is developed, the OCMI shall use the LOC card (Form CG-2832A). After examining a foreign vessel to which 46 CFR 153 or 154 applies and finding it satisfactory, the OCMI issues an LOC card and references the current Subchapter O endorsement (if applicable) in the Examination Record on the LOC card. If only minor deficiencies exist, the LOC may be issued and suitable notation of the deficiencies made in the LOC card's Examination Record at the discretion of the OCMI. When the LOC is issued, the following action shall be taken.

a. Enter all data called for on the LOC Card (Form CG-2832A).

b. Enter the expiration date, which should always be two years from the date of the last biennial examination.

NOTE: The LOC expiration date entered is not determined by the IMO Certificate expiration date.

c. Under "IMO Certificate," enter "None" or "See Subchapter O Endorsement," as appropriate.

d. Under "Last LOC Examination," enter the date/location of the last complete examination. Usually, this will be the same as the date/location of LOC issuance.

e. The face of LOC card shall be endorsed in the space above the signature block to indicate the grades of flammable or combustible cargo for which the vessel is suitable. The endorsement should read: "This vessel is considered safe for the carriage of grade (enter highest grade) and lower cargoes."

f. The OCMI shall sign and date the LOC card.

g. In the "Remarks" section of the LOC card's Examination Record, enter the results of the examination and, if applicable, refer to the current Subchapter O Endorsement issued by the Marine Safety Center as described in subparagraph MSM II-D6.G.8.a(1) below.

h. The expired LOC card and a photocopy of the newly issued LOC card (including the Examination Record) shall be forwarded to the Marine Safety Center along with the report required by Section E.9 below.

3. Non-Issuance of LOC

If the examination reveals that a vessel is unqualified for an LOC, take the following actions.

a. Enter all required information on the LOC card with the exception of issue date, expiration date, and validating signature of the issuing officer.

b. Enter the results of the examination into the "Examination Record" (or refer to an attached deficiency list).

c. Endorse the face of the LOC card to indicate the grades of flammable or combustible liquids, if any, for which the vessel is suitable.

d. Deliver the LOC card to the vessel's master with instructions to arrange for a reexamination after the deficiencies have been corrected. Also, instruct the master to present the form and any attached deficiency letters to the OCMI in the next U.S. port of call.

e. If the Subchapter O Endorsement was issued on the basis of an IMO COF, it shall be left on board the vessel. If the Subchapter O Endorsement was issued on the basis of Coast Guard plan review, expeditiously return it to the Marine Safety Center with the examination set of plans, unless the master intends to proceed directly to another U.S. port to have the deficiencies cleared. In the latter case, notify the OCMI at the next port and forward the Subchapter O Endorsement and examination set directly to that OCMI.

f. Notify the Marine Safety Center promptly by message [e-mail: MSC-COC@msc.uscg.mil] of the action taken when the LOC is not issued.

g. Enter the deficiencies in MSIS.

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4. Invalidation of the Subchapter O Endorsement

If a vessel's endorsement for Subchapter O cargo becomes invalid, the vessel is NOT authorized to carry any of the cargoes listed in 46 CFR 153, Table 1 or 46 CFR 154, Table 4 in U. S. waters. The endorsement may become invalid for any of the following reasons:

a. The IMO COF referenced in the Subchapter O Endorsement has expired;

b. Change of vessel registry;

c. Deficiencies in the cargo containment system or related safety systems which in the opinion of a Coast Guard marine inspector or boarding officer render the vessel unsuitable to transport Subchapter O cargo; or

d. Expiration of the LOC.

5. Expiration of IMO COF or Change of Vessel Registry

When a Subchapter O Endorsement references an IMO COF, the endorsement automatically becomes invalid if the COF expires; if the flag administration revokes, modifies, or reissues the COF; or if the vessel changes registry. Any change or addition to a COF, or issuance of a new COF, must be accepted by the Marine Safety Center, which will document acceptance by issuing a new or amended Subchapter O Endorsement. On "existing" liquefied gas vessels regulated under 46 CFR 154.12 and accepted on the basis of Coast Guard plan review, the Marine Safety Center may accept a COF for a limited number of cargoes (usually the "high vapor pressure chemicals," e.g., isoprene, propylene oxide). Therefore, when the COF expires, the Subchapter O Endorsement becomes invalid for the cargoes accepted based on the COF, but remains valid for the cargoes approved during plan review. For example, consider a vessel which the Coast Guard approved for ammonia, propane, and butane during plan review. Later the vessel receives an Existing Gas Code COF which, in addition to the three liquefied gas cargoes, lists isoprene. Accepting the COF only for isoprene, the Marine Safety Center places a statement in the Subchapter O Endorsement: "The vessel's COF is accepted for the carriage of isoprene only." If the COF expires, the vessel's Subchapter O Endorsement remains valid for ammonia, propane, and butane, but the vessel is not authorized to transport isoprene.

6. Action Required When COF is Invalid

If the COF is found to be invalid for a vessel arriving at a U.S. port, the Subchapter O Endorsement (but not the LOC) shall be invalidated by making the following entry in the "Remarks" column of the Examination Record of the LOC card: "Subchapter O Endorsement INVALIDATED this date." In the case of an existing gas vessel which underwent Coast Guard plan review, do not invalidate the Subchapter O Endorsement, but make an Examination Record entry prohibiting carriage of only those cargoes which were permitted based on the COF. The OCMI/COTP shall then:

a. Instruct the master that the vessel is no longer authorized to carry some/all Subchapter O cargo in U.S. ports and explain that new certification must be submitted to the Marine Safety Center in order to have the authorization reinstated;

b. Notify the Marine Safety Center and the OCMI/COTP of the next U.S. port of call by message [e-mail: MSC-COC@msc.uscg.mil] of the action taken; and

c. Enter a Vessel of Particular Interest (VPI) notice in MSIS stating the action taken and citing the reason.

7. Action Required When Serious Deficiencies are Found

If a vessel is found to have serious deficiencies, it may be judged unsuitable for the carriage of Subchapter O or Subchapter D cargoes, or both, in U.S. ports. If both Subchapter O and Subchapter D cargoes are restricted from carriage, the LOC should be invalidated by making the following entry in the "Remarks" column of the Examination Record: " Letter of Compliance INVALIDATED this date." In other cases, the OCMI may wish to limit only the carriage of Subchapter O cargo by invalidating the Subchapter O endorsement or Subchapter D cargo by invalidating the Subchapter D endorsement. In any case:

a. Enter the requirements for correction of the deficiencies in the "Remarks" column or refer to an attached letter.

b. Instruct the master that the vessel is no longer authorized to carry some/all cargoes in U.S. ports and that a reexamination must be arranged. The master must also present the invalid LOC and attached deficiency letter(s) to Coast Guard boarding teams at subsequent U.S. ports of call.

c. Notify the Marine Safety Center and the OCMI/COTP of the next port of call, by message [e-mail: MSC-COC@msc.uscg.mil], of action taken.

d. Enter a VPI notice in MSIS stating the action taken and listing deficiencies found.

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8. Examination Record Entries

Entries shall be made in the "Examination Record" section of the LOC card (Form CG-2832A) following the initial examinations and each subsequent annual examination; biennial examination; reexamination incidental to repairs or alterations; deficiency follow-up boardings; or other boardings incidental to the amendment, invalidation or revalidation of the LOC or Subchapter O Endorsement.

Nature of Entries

a. Nature of Entries. Complete the "Type of Examination" block and enter the results of each examination or boarding in the "Remarks" column of the Examination Record. When deficiencies are found, they shall be listed along with corrective actions taken or required to be taken. Any requirements as to the type of repairs and time permitted for completion shall be included. For each deficiency which remains uncorrected, the OCMI/COTP shall specify a period of time in which the deficiency must be corrected (e.g., at next U.S. port of call, within 90 days, at completion of next drydocking, etc.). If a deficiency list is too extensive to enter on the Examination Record, an entry shall be made referring to a separate, attached letter. The master shall be instructed to keep the letter available for subsequent Coast Guard boardings. If the Examination Record section of the LOC card is filled, a second copy of the LOC card shall be attached to the original LOC card and its Examination Record section utilized for subsequent entries.

(1) Sample Entries. Some typical entries made in the "Remarks" section of the Examination Record are:

(a) "Vessel examined for issuance of LOC - no deficiencies, LOC issued based on Subchapter O Endorsement issued by the Marine Safety Center and dated (enter date of Subchapter O Endorsement)."

(b) "Vessel examined for issuance of LOC, vessel found unsuitable for carriage of Subchapter O cargo, vessel may carry only Grade D and E combustible cargo until deficiencies in MSO Houston-Galveston letter dated 12 November 1995 are corrected."

(c) "Letter of Compliance INVALIDATED due to vessel deficiencies - see MSO Port Arthur letter dated 16 July 1995."

(d) "Routine safety boarding - incompatible cargoes stowed in adjacent tanks, corrected."

(e) "Vessel examined in accordance with 33 CFR 155, 156, and 164; 46 CFR 35; and SOLAS 74 - no deficiencies."

(f) "Letter of Compliance REVALIDATED this date - deficiencies noted in MSO New Orleans letter of 21 April 1994 satisfactorily corrected."

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9. Reports of Examinations or Re-Examinations

a. Send reports to the Marine Safety Center as indicated (e-mail: MSC-COC@msc.uscg.mil may be used for letter reports):

(1) Examination for initial issuance of a LOC with a Cargo Endorsement or a biennial examination for reissuance (message or MSIS mailbox followed by a letter report);

(2) Special examination arranged through the Marine Safety Center concerning vessel modifications and repairs (message or letter report);

(3) Any action resulting in invalidation of Subchapter O Endorsement or LOC (message followed by letter report); or

b. Content of Reports. Reports of examinations resulting in the issue of a LOC should include the following:

(1) Issue and expiration dates of the LOC.

(2) A photocopy of the newly issued LOC card including the Examination Record.

(3) Deficiencies found (indicate none, or send the list appearing on the Examination Record or a referenced deficiency letter).

(4) The expired LOC card and Subchapter O Endorsement.

(5) The OCMI should return any examination plan review set provided by the Marine Safety Center.

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10. Marine Safety Information System (MSIS). Tank vessel annual examinations, reexaminations, deficiency follow-up examinations, and monitors will be documented in MSIS by filing a Port Safety Activity Report (PSAR). Biennial LOC examinations must be documented by filing a Marine Inspection Activity Report (MIAR). To ensure the accuracy of the database used in making boarding decisions:

a. The MIAR inspection type code "CLC" will be used to document biennial LOC examinations.

b. The PSAR code "AES" will be used to document all annual tank vessel examinations.

c. The PSAR code "DOCK" will be used to document all tank vessel reexaminations. This code will only be used when a physical boarding is performed. (Those units that update document data based on electronically provided information may use the code "INV NEC" when filling a PSAR to record that activity.)

d. The PSAR codes "MSO" (Monitor Ship Oil), "OSL" (Monitor Offshore Lightering), "ISL" (Monitor Inshore Lightering), "MSD" (Monitor Dangerous Cargo), "MHG" (Monitor Hazardous Gas), "MBO" (Monitor Barge Oil) or "MBD" (Monitor Barge Dangerous Cargo) will be used to document all tank vessel monitors as applicable. These codes will NOT be used alone, but should be used in conjunction with either the "AES" or "DOCK" codes.

e. The PSAR code "MAR" (MARPOL General) shall be included as an activity type on all boardings. Estimate the time spent by the boarding office checking MARPOL related items and enter it under the "ACTIVITY" column after "MARPOL GEN". Do not include marine inspector time.

f. Until a change can be made to the PSAR, the "PERS" column will be used to record the number of "ACTIVITY" work hours spent by marine inspectors on annual tank vessel examinations and reexaminations. All work hours will be rounded to the nearest tenth of an hour, with the exception of marine inspector "ACTIVITY" hours which will be rounded to the nearest hour. Marine Inspector preparatory time, travel time, administrative time and time on board should be included under the "PERS" column.

g. No distinction needs to be made between marine inspector and port safety-boarding officer training hours in the PSAR. These hours will be combined under the applicable "TRAINING" column.

h. The certificate code "NON" (none) will be used for all tank vessel annual examinations and reexaminations.

i. Outstanding discrepancies and any significant discrepancies corrected during the boarding must be entered in the Port Safety Discrepancy Report (PSDR) product set.

j. Update the Vessel File Involved Party (VFIP) product set if different from that observed aboard the vessel. If a vessel's classification society is not listed or differs from that shown in VFIP, enter the appropriate classification society using the Involved Party Numbers (IPN) listed in Chapter D4.B.3.e. of this volume. The "OWNER" indicated in the VFIP should match that indicated on the vessel's registry. The "OPERATOR" indicated in the VFIP should match that indicated on the vessel's Certificate of Financial Responsibility (COFR).

k. The Vessel File List of Documents (VFLD) product set should be updated to reflect the status of the vessel's documents. If an annual examination or biennial LOC is conducted, ensure the next due date is entered. When a Subchapter O Endorsement is issued, the issuing office should change the issue date, port code, enter an expiration date, and change the status from "AMENDED" to "VALID." A Subchapter O Endorsement should expire on the same date as the LOC, unless the IMO Certificate of Fitness (COF) will expire before that date. In this case, the Subchapter O Endorsement expiration date will be the same as the expiration date of the COF.

l. MSIS entries including deficiencies are to be entered into MSIS within 48 hours of completing a boarding.

m. If a vessel is expected to arrive within another OCMI/COTP's zone of responsibility before MSIS can be updated, information regarding the boarding and any deficiencies or control action taken shall be relayed to the next port of call in the most expedient means available, (e.g. facsimile, telephone, E-mail etc.).

Vessels of Particular Interest (VPI) Notice for Internal Examination of Structural Integrity

n. Vessels of Particular Interest (VPI) Notice for Internal Examination of Structural Integrity. A VPI notice should be entered in MSIS after the annual examination of 10-year-old oil tankers to indicate the specific tank or space entered for the internal structural examination. A general indication of the results should also be included. Ideally, a different tank or space should be entered during subsequent exams to broaden the available information on the vessel. The expiration date of the VPI should be two years after the examination so as to maintain a reasonably current profile of the vessel's condition.

EXAMPLE: Figure D6-1 is an example of a completed PSAR for an annual examination including a monitor conducted by a senior marine inspector, boarding officer and a marine inspector (or boarding officer) trainee on a 10 year old chemical tanker completed in 4 hours.

FIGURE D6-1: Example of a Completed PSAR for an Annual Examination

PSAR PORT SAFETY ACTIVITY REPORT 02JAN95
CASE NUMBER/ PS95000001 PORT/ G-MOC ACTIVITY DATE/ 01JAN95 REF CASE/ .
CARGO: NAME/ VARIOUS CHEMICALS TYPE/ HAZARDOUS CARGO, BULK LIQUID .
OPERATION / OFFLOADING NEC DESC/
LOCATION / CITY, STATE
.
BOARD TIME / 0330 HIGH PRIORITY?/ Y TEAM LEADER INITS/ JJS
CERT ACTION/ NONE VALIDATE/ X CLOSE TO FILE/ .
COMMENTS / COMPETED ANNUAL EXAMINATION. .
.
SEL ---ACTIONS REPORTED ---
1 NUMBER OF DISCREPENCIES / OUT?/ N LEGAL ACTIONS?/N
2 VPI NOTICE / X
3 OPERATIONAL CONTROL IMPOSED/
4 NARRATIVE SUPPLEMENT /

VESSELS INVOLVED:
V/K VIN NAME FLAG SERVICE
V L1234567 NEVERSAIL CY TANKSHIP .
#DIS/ OUT?/ LEG.ACT?/ LPC/ ROTDM NPC/ PHILA
ACTIVITY TYPE(S)/ ANNUAL SHIP MON SHIP DC MARPOL GEN .
.
FACILITY INVOLVED:
V/K FIN NAME CATEGORY LOCAL ID
V GATXTERM GATX TERMINAL WATERFRONT FACILITY GRH0000001
#DIS/ OUT?/ LEG.ACT?/
ACTIVITY TYPE(S)/ MON SHIP DC

----------TOTAL TIME SPENT PER ACTIVITY----------
------REGULAR------- -------RESERVE--------
SUBJ ACTIVITY TYPE ACTIVITY TRAIN PERS ACTIVITY TRAIN PERS BOAT/AIRCRAFT
VI ANNUAL SHIP 2.0 3.0 8
VI MON PH HAZMAT 1.0
VI MARPOL GEN 1.0 1.0 1
.
.

ADMIN/ 8.0 ADMIN/
TRAV/ 6.0 TRAV/

H. GUIDANCE ON APPLICATION PROCEDURES AND THE LIMITED AUTHORITY TO CONDUCT OVERSEAS CERTIFICATE OF COMPLIANCE (COC) EXAMINATIONS

There has been an increase in the number of foreign flag tank vessels lightering cargo inside the U.S. Exclusive Economic Zone (EEZ), but which never actually come close enough to a U.S. port for easy access. Most of this lightering is conducted more than 60 miles from the nearest shore, requiring Coast Guard boarding personnel to be flown out by helicopter in order to conduct the Certificate of Compliance (COC) examinations. This procedure exposes our Coast Guard personnel to substantial risk and forces the vessel owner to pay for expensive helicopter charters.

1. Goal to Minimize Risk to CG Personnel & Facilitate Commerce

This policy will minimize the risk to Coast Guard personnel while assisting vessel owner/operators by facilitating the required regulatory examinations of vessels identified in this guidance. Foreign flag tank vessel owners/operators whose vessels are engaged in offshore lightering may apply to the cognizant overseas USCG Officer-in-Charge, Marine Inspection (OCMI) (e.g., Far East Activities or Activities/MIO Europe) to have their COC conducted at an overseas port. The overseas OCMI may either approve or deny the application based on:

a. Completeness of the application;

b. The applicant meeting all the requirements for consideration as set forth in this document;

c. The applicant remitting the applicable user fees as required by 46 CFR Part 2, and a written agreement from the owner/operator to pay all reimbursable expenses; and

d. Availability of unit resources.

2. Vessel Eligibility

Vessels eligible for consideration are those:

a. Whose current COC (Tank Vessel Examination Letter—TVEL, or Letter of Compliance—LOC) expires before initiation of the next cargo transfer in U.S. waters; or,

b. That will be on its first voyage to the U.S.; or,

c. Have recently come under either new ownership or re-flagging and need an initial COC; and

d. That are under current charter agreement specifically indicating that the vessel will conduct lightering operations at a distance offshore that necessitates the

use of charters to transport Coast Guard personnel to and from the vessel, or have a record of trading in this pattern.

3. Vessels Must Be Trading to U.S.

Under no circumstances are foreign vessel examinations to be conducted overseas based on the *potential* that a vessel *may* trade in the United States at some unspecified time in the future. Examinations will be conducted solely for the purpose of issuance of the applicable COC.

4. Manner of Conducting Examinations

Overseas COC examinations will be handled in the following manner regarding the Coast Guard Port State Control (PSC) Boarding Matrix.

a. The overseas COC will count towards the PSC Boarding Matrix boarding frequency history;

b. Priority I and Priority II vessels may apply for an overseas COC, however, the vessel owner/operator is to be informed that the vessel may also be boarded prior to being allowed to conduct cargo operations in the U.S. The overseas OCMI is encouraged to consult with the intended lightering port's OCMI to coordinate the most effective and efficient action to take relative to these vessels;

NOTE: Vessels which are categorized as Priority II vessels solely due to the fact that their COC has expired will, by merit of having received a valid COC from the overseas OCMI, no longer be a Priority II vessel upon arrival in the U.S. EEZ.

c. Priority III and IV vessel may apply without restriction.

5. Notification of CONUS OCMI of Damages

Nothing in this instruction relieves the vessel of its requirement to notify the cognizant OCMI of any damages/casualties experienced during a voyage to the U.S. prior to arrival. It also does not preclude the CONUS OCMI's authority and responsibility to board vessels which experience damage between the time the COC is issued and the vessel's U.S. arrival, nor does it prevent the CONUS OCMI from making boardings outside the scope of this policy.

6. Controlling Regulations

Vessel examinations for accepted applications will be conducted in accordance with reference (a), the applicable portions of Titles 33 and 46 Code of Federal Regulations, and those controlling international treaties and conventions, and official Coast Guard policy, with the following modifications:

Exceptions

a. Certain vessel requirements do not apply to vessels during either lightering or discharge-only operations. For those requirements which are not required due to the discharge/lightering only occupation of these "special case" vessels, an endorsement on the COC document must be made identifying the special restrictions. Similarly, the conditions of the restriction are to be noted in MSIS/MSN. [*For example: Overfill device requirements are only applicable to vessels loading cargo. Vessels being examined which do not have overfill devices installed will have their COC document (TVE or LOC) endorsed stating that the vessel is not in compliance with 33 CFR 155.480 and is restricted to only conducting lightering discharge operations while in the U.S. EEZ. Should the vessel at some future date enter a U.S. port for loading cargo, the devices must be properly installed and a new TVE/LOC issued after a satisfactory examination is by the cognizant OCMI.*]

Deficiencies

b. Deficiencies issued during the examination will be in accordance with MSM Vol. II, A3-C-3(g). Priority 1 deficiencies would preclude the issuance of a TVE/LOC. Priority 2 deficiencies would include deficiencies that would have to be cleared before conducting cargo operations or may be cleared by written statement from the vessel Master in accordance with OCMI direction. For vessels examined under this policy it may be in the best interest of all parties—USCG and vessel owner/operator—to clear only Priority II requirements requiring a Coast Guard boarding, before departing for the U.S.

(1) Vessels whose deficiencies are categorized as Priority 1 (i.e., preclude transfer in the U.S. EEZ) must clear these deficiencies before a COC document will be issued.

(2) Vessels whose deficiencies are categorized as Priority 2 may clear these deficiencies through a suitable arrangement specified by the OCMI.

7. MSIS

The Marine Safety Information System, and its successor database, is to be updated upon conclusion of the COC exam, including *Inspection Notes,* and all special restrictions.

8. User's Fees & Reimbursable Expenses

The appropriate fees incurred by this inspection are:

a. 46 CFR 2.10-120; Overseas Inspection Fee

b. 46 CFR 2.10-125; TVE Fee

c. Reimbursable travel expenses

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A. HISTORY OF PASSENGER VESSEL FIRE SAFETY

1. International Convention for the Safety of Life at Sea (SOLAS) 1929

SOLAS 1929 contained the first international requirements on structural fire protection for passenger vessels, calling for the installation of fire-resistant bulkheads above the bulkhead deck at intervals not exceeding 40 meters. Such bulkheads were required to resist a temperature of 815° Celsius for 1 hour. Serious fires occurring on passenger vessels in the early 1930's, e.g., the GEORGES PHILIPPAR, L'ATLANTIQUE, and the MORRO CASTLE, gave rise to great concern in the maritime countries, which concluded that the existing requirements were insufficient. In the U.S., an extensive series of tests were carried out on board the steam ship NANTASKET in 1936. As a result of these tests, U.S. regulations for the construction of passenger vessels were amended in 1936. The new regulations called for the installation of internal bulkheads of incombustible material with a view to containment of fire in the space of origin. In the United Kingdom, regulations for fire safety measures in passenger vessels, formulated in 1937, depended on automatic sprinkler systems. Similar development of national requirements for fire prevention took place in France and other maritime countries.

2. SOLAS 48 and 60

At the Safety Conference in 1948, delegates of the U.S., United Kingdom, and France proposed the adoption of their national systems of fire protection. The 1948 Safety Convention adopted all three systems. They are known as Method I, (U.S.), Method II (United Kingdom), and Method III (France). In addition, specific provisions were incorporated in the Convention for fire detection and fire extinguishing appliances in machinery and other spaces, for means of escape, for musters, and for fire drills. SOLAS 48 entered into force on 19 November 1952. The requirements of SOLAS 48 were reviewed at the Safety Conference in 1960; a number of amendments were incorporated in SOLAS 60, which came into force on 26 May 1965.

3. Maritime Safety Committee (MSC) Efforts

Passenger Vessel Fire Safety

a. Passenger Vessel Fire Safety. The attention of maritime countries was aroused after old passenger vessels, including the LAKONIA, YARMOUTH CASTLE, and VIKING PRINCESS, suffered serious fire casualties with heavy loss of life. In May 1966, a special meeting of the MSC of the Intergovernmental Maritime Consultative Organization (IMCO) was summoned to consider measures for improving the fire safety of passenger vessels.

NOTE: In May 1982, IMCO changed its name to the International Maritime Organization (IMO).

The MSC first directed attention to the problem of fire safety in older passenger vessels and, after thorough consideration of the problem, agreed upon a series of proposed amendments to the fire safety regulations in SOLAS 60. In November l966, representatives and experts from 46 countries met at the special IMCO Assembly and adopted the proposed amendments and recommendations submitted by the MSC. These 1966 amendments (IMCO Resolution A.108(ES.III)) proposed additional fire protection standards for existing passenger vessels. Major changes required vessels to be constructed of steel; separation of accommodation spaces from machinery, cargo, and service spaces; protection of control stations, stairways and lifts; reduction in the amount of combustible material used in accommodation spaces; and the installation of automatic sprinkler or fire detection systems. Under these provisions, old passenger vessels were required to be brought into close conformity with one of the methods of fire protection specified in the 1960 Safety Convention. For pre-SOLAS 48 vessels, the additional requirements normally involved structural modification.

Future Passenger Vessel Fire Safety

b. Future Passenger Vessel Fire Safety. Another task was the improvement in fire safety of future passenger vessels. The MSC requested that the IMCO Subcommittee on Fire Protection develop a new system of fire protection, taking into account the best features of the existing three methods of fire protection and considering the maximum use of noncombustible material and the appropriate use of automatic sprinkler and detection systems. Requirements for new vessels were proposed as the 1967 Fire Safety Amendments (IMCO Resolution A.122(V)). In part due to the stringent amendment approval process, the 1966 and 1967 Amendments were never ratified by the required number of countries to bring them into force internationally. SOLAS 74, which came into force on 25 May 1980, incorporated the 1966 and 1967 Amendments for fire safety.

4. Examination Program

In 1968, the U.S. unilaterally required all passenger vessels with overnight accommodations for 50 or more passengers to meet the 1966 Fire Safety Amendments or U.S. passenger vessel requirements. The present law (46 U.S.C. 3505) requires that the Secretary of the Department of Transportation (SECDOT) determine that the vessels meet SOLAS and applicable U.S. requirements. An evaluation of the program in 1984, as a result of fires on board the SCANDINAVIAN SEA and SCANDINAVIAN SUN, concluded that the examination program for foreign passenger vessels is still needed, both for vessels built before SOLAS 74 came into force and new vessels under SOLAS 74.

5. Retroactive Fire Safety Amendments

a. Spaces which currently give direct access to, or which are located within, stairway enclosures must not be used to store combustible or flammable materials that may present an elevated fire risk or hazardous condition. Examples of these combustible materials are cleaning fluids, paints, and other hazardous chemical products. Doors separating such spaces should be kept closed and in good operating condition. Spaces, such as galleys, Category A machinery spaces, engine rooms, boiler rooms, and similar spaces, having direct access to stairway enclosures should be treated similarly. No structural modifications will be required until 1 October 1997. Compliance and maintenance must be borne by owners and operators of vessels, ship's masters and crew.

b. Physical modifications of existing ships to comply with the RFSAs described in paragraph D7.A.1.c.(3) should not result in direct access between stairway enclosures and spaces other than public spaces, corridors, public toilets, special category spaces, other stairways required by SOLAS Regulation II-2/28.1.5, and open deck spaces. Such arrangements should not be found on SOLAS 74 vessels. If so, such spaces must be removed and not have direct access to the stairway enclosures. SOLAS 60 and SOLAS 48 vessels having existing spaces <u>within</u> the stairway enclosures will be required to either:

(1) Empty, permanently close, and disconnect the electrical system in such spaces; or

(2) Separate such spaces from the stairway enclosure by the provisions of "A" class divisions in accordance with SOLAS 74, Regulation 26. Such spaces may have direct access to the stairway enclosure by the provisions of "A" class doors in accordance with SOLAS 74, Regulation 26, and subject to a sprinkler system being provided. Cabins may <u>not</u> open directly into stairway enclosures.

Additionally, construction of short dead-end corridors or vestibules in an attempt to eliminate direct access to stairways in not permitted. Owners proceeding with modifications to comply with these fire safety amendments prior to the implementation dates should submit plans approved by the flag state to the MSC for review.

6. USPHS Sanitary Condition Inspections

Under Congressional mandate, the Centers for Disease Control (CDC) oversees a cruise ship sanitary condition inspection program. The program is made up of several components which include: periodic unannounced inspections of ships carrying passengers from U.S. ports; follow-up inspection, reinspections and other inspections, as necessary; technical consultation for new construction or refitting of older ships; investigation of disease outbreaks when they occur; biweekly publication of inspection results in the Summary of Health Information for Intentional Travel (Blue Sheet); and provisions of inspection reports on individual vessels to the public on request. The CDC program will be directed at vessels carrying more than twelve passengers, however, any report of unsanitary conditions will be investigated. A 24-hour answering service is maintained by their Miami office with additional staff specialists available at the CDC in Atlanta, GA and the Quarantine Station in Los Angeles, CA. Coast Guard marine safety personnel may relay any report of unsanitary passenger-carrying vessel conditions to the following PHS points of contact:

USPHS Vessel Sanitation Program
Office of the Chief
P.O. Box DQ, CPS, CDC
1015 North American Way, Room 107
Miami, FL 33132-2017
(305) 536-4307

Mr. Anthony Perez
Centers for Disease Control
Center for Prevention Services, Division of Quarantine
Atlanta, GA 30333
(404) 329-2574

Mr. Thomas A. DeMarcus
Quarantine Station, USPHS Quarantine
P.O. Box 90834 LAX
Los Angeles, CA 90009
(213) 215-2365

B. APPLICABLE PROCEDURES

Navigation Vessel Inspection Circular (NVIC) 3-79 provides information concerning the assessment of lifeboat capacity on foreign passenger vessels; NVIC 1-93 provides detailed examination procedures (including plan review) for initial examinations, annual examinations, and quarterly reexaminations of foreign passenger vessels; and NVIC 4-95 provides detailed guidance on the application and enforcement of the SOLAS 1992 Fire Safety Amendments to existing passenger vessels. NVIC 1-93 also has provisions for conducting initial examinations at foreign ports.

1. Initial Examinations of Passenger Vessels

Concern for the safety of U.S. citizens that embark on foreign flag passenger vessels continues to be one of our highest priorities. In U.S. ports this concern includes all passengers, U.S. and foreign. A foreign passenger vessel will fit one of the three categories described below. A determination as to the appropriate category must be made when such a vessel enters the United States for the first time. The specific category will determine the appropriate response by the Officer-in-Charge Marine Inspection (OCMI). This categorization will dictate the need for plan review and approval, boarding, examination, inspection and/or the issuance of appropriate Coast Guard certificates. Note that these guidelines are nearly identical for both passenger vessels (100 gross tons and over) and small passenger vessels (under 100 gross tons). These categories are:

a. Vessels registered with an administration signatory to SOLAS 74/78 and in possession of valid Passenger Ship Safety and Exemption Certificates.

b. Vessels registered with an administration signatory to SOLAS 74/78, but not holding valid Passenger Ship Safety or Exemption Certificates.

c. Vessels registered with an administration not signatory to SOLAS 74/78.

2. Passenger Vessels Registered With an Administration Signatory to SOLAS

a. Passenger Vessels Registered with an Administration Signatory to SOLAS 74/78 and in Possession of Valid Passenger Ship Safety and Exemption Certificates. When both the Passenger Ship Safety and Exemption Certificates refer only to SOLAS requirements, an examination shall be conducted in sufficient depth and scope to assure that SOLAS 74/78 is being met, keeping in mind the International Maritime Organization's Guidelines on Procedures for Port State Control (Resolution A.787(19)). This examination should include, among other items, operational tests of main, vital, and safety related machinery; fire drills; lifeboat drills; and the removal of sufficient bulkhead and overhead coverings to verify the installation of appropriate structural fire protection material where required. A Control Verification Certificate may be issued at the successful conclusion of this examination. G-MOC should be consulted in cases where the OCMI believes exemptions issued by the flag administration render the vessel unacceptable for service from a U.S. port.

(1) When the Passenger Ship Safety and/or Exemption Certificates claim adherence to U.S. Coast Guard regulations, in whole or in part, a more detailed examination must be conducted to assure compliance with the referenced Coast Guard regulations. Panama has referenced Subchapter T on some of its vessels that were former U.S. flag "T-boats" now operating locally on cruises to nowhere. In general, this exam should proceed on the same scale as if the vessel were U.S. flag, including the specific requirements described above as they apply to the vessel in question on the specific route or area of operation. A Cargo, Miscellaneous and Passenger Vessel Hull Inspection Book (CG-840A), Machinery Inspection Book (CG-840B) or Small Passenger Vessel Inspection Book (CG-840T), as applicable, should be used as a guide for completing this examination.

(2) The U.S. has filed with the IMO an equivalency statement, applicable to certain U.S. flag small passenger vessels on international voyages, for structural fire protection and lifesaving equipment. It has been reported that some administrations may apply this equivalency to their vessels, whereupon it will be listed on their Exemption Certificates. That is acceptable, subject to the results of the examination and verification that the vessel in question meets the criteria established in the equivalency statement (i.e., operates not more than 20 miles from land, under 100 gross tons, overnight accommodations for less than 50 passengers, less than 150 passengers, equipped with inflatable liferafts [or inflatable buoyant apparatus in warmer waters] for 100% of the persons on board, and certificated for an ocean route). If this criteria is not met, the vessel in question must meet SOLAS 74/78 or the requirements in 46 Code of Federal Regulations (CFR) Subchapter T, just as a U.S. vessel of similar design and service would be required to meet. In applying U.S. regulations, the vessel's date of build is immaterial because the regulations in effect on the date of application will apply.

b. Passenger Vessels Registered with an Administration Signatory to SOLAS 74/78, but not Holding Valid Passenger Ship Safety or Exemption Certificates.

Intervention under SOLAS 74/78 Chapter I, Regulation 19, is appropriate. Alternatively, compliance with Subchapter H, K or T, as appropriate, including issuance of a Certificate of Inspection in the same manner as for a domestic vessel, would be acceptable. It is within the OCMI's discretion to determine the better solution. Note that failure to examine the external underwater body of the vessel, as required by SOLAS 74/78, Regulation 7(b)(ii), invalidates SOLAS certificates.

3. Passenger Vessels Registered With an Administration Not Signatory to SOLAS

a. Passenger Vessels Registered with an Administration not Signatory to SOLAS or Passenger Vessels to which the Convention does not Apply. Passenger vessels of foreign nations not party to SOLAS, or to which the Convention does not apply, that embark any number of passengers from any U.S. port must meet 46 CFR Subchapter H, K, T or C, as appropriate. A certificate of inspection should be issued if a vessel subject to Subchapter H, K or T meets the requirements. The scope and detail of the inspection shall be the same as for a U.S. vessel.

b. Cargo Vessels Registered with an Administration not Signatory to SOLAS, or to which the Convention does not Apply, that Carry Passengers. Such vessels are not considered passenger vessels unless carrying 13 or more passengers. As cargo vessels they must meet 46 CFR Subchapter I, D, or O, as appropriate. A Certificate of Inspection should be issued if the vessel meets these requirements. The scope and detail of the inspection shall be the same as for a U.S. vessel.

4. Foreign Passenger Vessels Operating on "Cruises to Nowhere"

Foreign passenger vessels, regardless of their tonnage, operated on a day-service or "cruise to nowhere" basis are not on an international voyage. Therefore, it has been argued that SOLAS 74/78 would not apply. However, because the Coast Guard and most flag administrations recognize the special care and concern for passenger safety needed for this trade, the actions recommended above will apply to these vessels, as well as those on conventional international voyages.

C. EXAMINATIONS

Under Coast Guard policy set forth in the "M" Business Plan (COMDTINST 16000.26), each foreign passenger vessel embarking passengers from U.S. ports shall be examined at its first port of call in the U.S. and at least annually thereafter. Quarterly reexaminations shall also be conducted. Such a vessel operating on routes to several U.S. ports and under the jurisdiction of more than one OCMI shall be examined at least quarterly by one of the offices. Coordination between offices is encouraged. There are three different examinations for foreign passenger vessels: initial examination, annual examination, and quarterly reexamination. The importance of these examinations from primarily a fire safety and lifesaving point of view are described below. This is not to downplay the importance of examining the entire vessel for compliance with all SOLAS, statutory, and regulatory requirements, but rather to emphasize the extreme importance of fire safety and lifesaving for passenger vessels. The Foreign Passenger Vessel Examination Book will be used in conducting examinations and reexaminations.

1. Initial Examination

Foreign passenger vessels intending to embark passengers for the first time from a U.S. port; that have undergone a modification or alteration of a "major character" as defined by SOLAS Regulation II-2/1.3; that return to service more than two years after their last annual examination and whose plans have not been reviewed by the Marine Safety Center within five years; and certain vessels selected by the Commandant shall be subject to plan review and an initial examination in accordance with NVIC 1-93. See Section 4.b below for guidance on conducting drills.

Application of the 1992 Fire Safety Amendments to Existing Passenger Vessels (Keel Laid Prior to 1 October 1994).

a. The 1992 Fire Safety Amendments to SOLAS apply retroactively to existing passenger vessels and phase in over a 16-year period. The amendments require significant modifications to existing passenger vessels which carry more than 36 passengers. To determine compliance, the Commandant directed that all existing foreign passenger vessels which carry more than 36 passengers and embark passengers from U.S. ports undergo an initial examination in accordance with NVIC 1-93. NVIC 4-95 provides additional guidance and information to ensure consistent enforcement of the 1992 Amendments.

Existing Passenger Vessels (Keel Laid on or after 25 May 1980).

b. Passenger vessels built as new vessels under SOLAS 74, or vessels built on or after 25 May 1980 to meet the requirements of the 1967 Fire Safety Amendments (which are the same as SOLAS 74 requirements for new vessels), shall comply with the following 1992 SOLAS Amendments:

(1) Paragraph 1 of regulation 41-2 (as of 1 October 1994); and

(2) Paragraphs 2 and 4 of regulation 41-2 not later than 1 October 1997; and

(3) Paragraph 6 of regulation 41-2 not later than 1 October 2000; and

(4) Paragraph 5 of regulation 41-2 not later than 1 October 2005 or 15 years after the date of construction, whichever occurs later.

Existing Passenger Vessels (Keel Laid Prior to 25 May 1980).

c. Passenger vessels which do not comply with all the requirements of SOLAS Chapter II-2 applicable to ships constructed on or after 25 May 1980 shall comply with the following 1992 SOLAS Amendments:

(1) Paragraph 1 of regulation 41-2 (as of 1 October 1994); and

(2) Paragraphs 2, 3, 4 and 5 of regulation 41-2 not later than 1 October 1997; and

(3) Paragraph 6 of regulation 41-2 not later than 1 October 2000; and

(4) All requirements of Chapter II-2 applicable to vessels constructed on or after 25 May 1980 not later than 1 October 2010.

Method I, II and III Construction

d. Before starting an examination of an existing passenger vessel built before 25 May 1980, which is not built to the 1967 Fire Safety Amendments, it is essential that the method of construction or possible combination of methods used in the construction be known. The basic concern of the examination of these vessels is that they meet the Convention to which they were built and have been upgraded as required by SOLAS 74, Chapter II-2. SOLAS 29, 48, and 60 can be found in Commandant Instruction (COMDTINST) M16707.1, International Conventions and Conferences on Marine Safety. The examination should also verify that the vessel conforms to the submitted plans. From a fire safety standpoint many of the items stressed for new construction are even more important for existing passenger vessels. Since four different conventions and three different methods of construction may be involved, the boarding team must become very knowledgeable of the particular convention that is applicable and thoroughly examine the vessel to ensure that the requirements of that convention are complied with. An understanding of the three methods of fire protection is necessary to conduct a good examination.

Method I

(1) This is the only one of the three Convention methods, to the best of our knowledge, which is based upon extensive fire test experience aboard vessels. This method had been employed with considerable success in the U.S. prior to its presentation at the 1948 Conference. Convinced of its effectiveness, Method I was strongly supported by the maritime industry. The primary reliance with Method I is on containment of the fire to the space of origin by suitable structural and thermal boundaries. Combustibles are minimized. The vessel is divided into a number of discrete cells, each one of which is capable of containing a fire within that space. Should fire, for some reason, progress beyond a particular space, it would only encounter another "fire-cell." In Method I, the objectives of separating the accommodation spaces from the remainder of the vessel by thermal and structural boundaries and the protection of the means of escape are inherent in the system. There is no fixed active fire protection (fire detection or sprinkler system) equipment to malfunction, the subsequent inspections are relatively simple, and little reliance is placed upon the effective firefighting capabilities of the crew. The expenditure of effort in dealing with the fire problem under this method is entirely in the construction stage, which then lasts for the life of the vessel, whether at sea or in port. This method has been most effective in keeping fires in vessels from becoming a serious problem. No passenger lives have been lost due to fire on U.S. flag passenger vessels since 1946. Records prior to this date are difficult to substantiate, but it is believed that no passenger lives have been lost due to fire since the MORRO CASTLE.

Method II

(2) Method II employs the automatic sprinkler system as the first line of defense in combating fires. There is no restriction on the quantity of combustible materials which can be installed. The first line of defense depends entirely upon catching the fire in its incipient stage. The first line of defense may not be effective because of mechanical failure of the system. It may also not be effective because of a fire originating in the space containing the sprinkler pumps or because of a fire starting in unsprinklered concealed spaces (in which case the fire might gain headway and overpower the limited capacity sprinkler system). Moreover, a space which was not considered as having a substantial fire risk when the vessel was built may not have sprinklers. As the character of spaces change during the service of the vessel, such unsprinklered spaces may inadvertently be converted to the stowage of combustibles without extension of the sprinkler system. The secondary lines of fire defense are provided by separation of the accommodation spaces from other spaces on the vessel by "A" class bulkheads, low flame spread materials in the escape routes and hidden spaces, and Main Vertical Zone's (MVZ's).

The secondary lines of defense in the case of Method II play a very important function in permitting limited time for the rapid evacuation of passengers and crew. It is highly doubtful, however, that these secondary lines of defense alone could save the vessel and all of the passengers when there is no limit on the quantity of combustibles in a vessel's construction. The Class A, 1-hour division concept originated with Method I and was the result of extensive testing. One hour was considered sufficient if combustibles in construction were minimized. It is not adequate, as demonstrated by numerous fires, when large quantities of combustibles are employed.

NOTE: Smoke can be a very serious problem when large quantities of combustibles are installed.

Method II relies upon a mechanical system which is subject to malfunction or lack of maintenance. The system is very difficult to test for proper operation of all elements. The principal drawbacks to this system are the necessity for continuous maintenance, the difficulty of effective inspection, the possibility of fire originating in concealed or other unsprinklered spaces, the necessity for continuous sources of water and power, and the possibility of fire originating in spaces containing the sprinkler pumps.

Method III

(3) In Method III, the primary reliance is placed upon early detection of the fire by an installed detection system and prompt firefighting action on the part of the crew. Fire detection systems aboard vessels have notably poor records. For example, they were ineffective for various reasons during fires aboard the vessels LAKONIA, QUEBEC, and RIO JACHAL. In order to contain a fire after the assumed early detection, there are two elements available. The vessel is subdivided into a number of areas, in general not exceeding 1300 square feet. The crew would be expected to take prompt firefighting action to contain a fire to one of these areas. To provide an increase in fire protection in existing passenger vessels complying with Method III, hoses should be connected to hydrants and pressure maintained on the firemain at all times. Should the fire not be contained within a single area, the MVZ bulkheads are to serve as secondary fire stops. Under Method III, the degree of flammability of materials is limited, but no real limit is placed on the total quantity of combustibles which might be contained within a single space. Here again, the containment of any fire to a single MVZ is believed to be temporary, unless there is a prompt and effective firefighting effort. With this method, inspectors must be concerned with both the mechanical element of the fire detecting system and the human element of crew readiness.

2. Annual Examination

The purpose of the annual examination is to ensure that the vessel continues to maintain all the systems that were examined in the initial port call examination. This examination should determine that all detection and sprinkler systems are operable, all fire doors are operable and clear of obstructions, lifesaving gear is being maintained and fixed fire extinguishing systems are in satisfactory condition. This examination will include fire and boat drills as discussed in Section 4.b. below. See NVIC 1-93 for further details on conducting annual examinations.

Vessel Changes

a. During these examinations inspectors should remain alert for changes to the vessel. The 1981 Amendments to SOLAS 74 (Reg. II-2/1.3) require that all vessels which undergo repairs, alterations, modifications, and outfitting related thereto shall continue to comply with at least the requirements previously applicable to these vessels. Of particular concern is the refurbishment of passenger accommodations and the potential use of materials which are capable of producing large quantities of smoke and toxic products (i.e., replacing the covering on chipboard with plastic or synthetic materials).

Carbon Dioxide Discharge Lines

b. Carbon Dioxide Discharge Lines. It is a practice in some shipyards to place blanks in CO2 discharge lines to prevent accidental discharge. Vessels returning from a shipyard should be checked to ensure that all blanks have been removed. Inspectors should also be alert to alterations that may adversely affect the vessel's structural fire protection.

In Port Fire Watch

c. When inspectors are on board they should verify the existence of an in port fire watch. The need for prompt reaction to the presence of smoke or fire on board passenger vessels requires that the installed controls be capable of immediate use. When at sea, the bridge and engine room control stations are manned. This provides immediate access to communication centers; fire detection, suppression and isolation systems; and passenger and crew alarms. When the vessel is in port, the at sea watch is terminated and the hotel nature of the operation is dominant. The potential for fire does not diminish when a vessel is in port. While passengers are on board, the bridge and engine room control spaces should be manned with qualified individuals of sufficient training and experience to initiate a prompt and effective response to the detection of smoke and/or fire on the vessel. A requirement for a fire watch should be included in local marine firefighting contingency plans.

3. Quarterly Reexaminations

Reexaminations are intended to ensure that a vessel is being operated in a safe manner. The reexamination should ensure that materials are not stored in escape routes, that the condition of the vessel is being maintained, and that the crew remains familiar with the vessel. Fire and abandon ship drills will normally be conducted in accordance with Section 4.b. below. See NVIC 1-93 for further details on conducting quarterly reexaminations.

4. Specific Procedures Applicable to Examinations and Reexams

Examination of Documents

a. Examination of Documents. Sight and review pertinent vessel documents, certificates, and officers' licenses in accordance with Section C of Appendix A and NVIC 1-93.

Safe Manning Document

(1) Safe Manning Document. SOLAS Chapter V, Regulation 13, requires all ships of 500 gross tons and more on international voyages to be issued a safe manning document. This document is to state what the flag state administration considers to be the minimum complement necessary to ensure the vessel is sufficiently and efficiently manned from the point of view of safety. There is no standard format for a safe manning document, though some guidance on the elements to be included in the document can be found in IMO resolution A.481(XII), Annex 1, and guidance to be taken into account in determining safe manning can be found in Annex 2 of that IMO resolution. However, there are no specific manning scales which can be considered as an international standard for assessing the adequacy of the crew complement on a seagoing ship. Therefore, the boarding team must use good judgment in questioning a flag state's determination of the adequacy of a vessel's manning level.

(a) Every foreign flag vessel of 500 gross tons or more visiting a U.S. port should have on board a safe manning document issued by the vessel's flag state administration. If the document is in a foreign language, an English translation is to be available. The document should contain the following information:

- Identification of the ship;

- A table showing the numbers and grades of personnel required to be carried, together with any special conditions or limitations based on the particulars of the ship or the nature of the service upon which it is engaged; and
- The date of issue and expiration along with a signature for and the seal of the administration.

(b) In the event a safe manning document is available, the flag state is a party to SOLAS, the information in the document is complete, and the required crew complement is consistent with normal expectations for a ship of its size and service, no further action is required with respect to the manning document itself.

STCW

(2) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1995 (STCW). Refer to Ch. D5.C.6.c and NVIC 3-98 for guidance.

General Examination

b. General Examination. See NVIC 1-93.

Fire Drill

(1) Fire Drill. The ability of the crew to respond to emergencies is witnessed during the drill. All crewmembers are to participate except for a limited number of crew on watch in machinery spaces. One suggested method of conducting the fire drill is to choose a specific location in the vessel (passenger cabin, paint locker, storage room, etc.) for a simulated fire.

Conducting the Drill

(a) Conducting the Drill. Have a crewmember go to the location and activate the manual fire alarm system. Observe the alarm indication on the fire alarm panel and the responses of the vessel's officers. A normal procedure is to send an officer or fire patrolman to investigate. Go to the location and describe the fire indication (smoke, flames, etc.) to the investigator. Observe how the report of fire is relayed to the bridge or damage control center. At this point most vessels will sound the crew alarm to summon the firefighting parties and the remainder of the crew to their stations. Observe the firefighting party arriving on scene, breaking out their equipment and fighting the simulated fire. Team leaders should be giving orders as appropriate to their crews and passing word back to the bridge or damage control center on the conditions. The firefighting crews should be observed for proper donning and use of their equipment. Make sure that all of the gear is compatible; e.g., the breathing apparatus can be worn with the protective suit, the helmet can be worn with the air mask, and the lifeline can be attached to breathing apparatus or belt. Merely mustering the emergency

crews with their gear is not acceptable. Crew response to personnel injuries can be checked by selecting a crewmember as a simulated casualty. Observe how the word is passed and the response of stretcher and medical teams. Handling a stretcher properly through narrow passageways, doors and stairtowers is difficult and takes practice.

Station Bill and Crewmember Duties

(b) Station Bill and Crewmember Duties. The station bill should be consulted to determine the duties and location of other crewmembers such as those assigned to emergency generators, CO2 room, sprinkler pumps and other essential equipment. Those areas should be visited during the drill and the crew should demonstrate use of the equipment and be quizzed in their duties. During the drill, note the vessel's command organization. Orders should be passed down the chain of command and information and reports passed up smoothly. All team leaders should know how many people are assigned to their team, what their duties are and to whom they are to report. Crewmembers not assigned to the firefighting teams are generally assigned to locations throughout the passenger accommodations to assist in passenger evacuation. These crewmembers should be quizzed on their duties and the meaning of the various emergency signals. Additionally, they should be asked to point out the two means of escape from the area and where the passengers are to report. Language difficulties are frequently encountered. Crewmembers assigned to assist passengers should be able to communicate at least enough information to direct a passenger to the proper muster area.

Firescreen Doors

(c) Firescreen Doors. Operation of firescreen doors is to be observed during the fire drill. If time permits, all doors are to be checked for proper latching and full closure. Remote indicators for firescreen doors are not required by SOLAS; however, if fitted, vessel owners should be encouraged to repair any faulty indicators observed.

Local Fire Department Responsibilities

(d) Local Fire Department Responsibilities. The local fire department normally has the responsibility for fighting vessel fires in port. Therefore, it is important that local firemen understand vessel organization, layout, and firefighting capabilities. Representatives of the local fire department should be encouraged to join Coast Guard inspectors to observe fire drills and to become familiar with passenger vessels in their ports. Vessel personnel are generally very receptive to having firefighters on board during these evolutions. The exchange of information between all concerned during and after drills can be most beneficial.

Abandon Ship Drill

(2) Abandon Ship Drill. SOLAS 74, Chapter III, requires the number of lifeboats and davit-launched life rafts required to accommodate all persons on board to be capable of being launched in 30 minutes. During drills, the lifeboats will normally not be loaded with passengers; therefore, they should be capable of being lowered well within the 30-minute limit. It is the practice of some vessels to have only a limited number of crewmembers operate the lifeboat davit winches. These winch crews operate one set at a time rather than having a crew at each davit. This may make it difficult to meet the 30-minute limit. SOLAS 74 permits up to 25 percent of the total required lifeboats to be substituted with davit launched inflatable life rafts. These life rafts are launched in succession from one or more davits. The securing hook must be recovered after each raft is lowered and released. The process is time-consuming and more complicated than operation of conventional gravity lifeboat davits. If the vessel has a practice raft available, the davit crews should demonstrate its use. If no practice raft is available, the crews should be quizzed and should demonstrate the davit operation without actually inflating a raft. It is the practice of some vessels to assign members of the hotel or catering staffs as the launching crews for these rafts. These crews should be observed closely in this situation, since handling equipment of this nature is not in the normal course of their regular duties.

(3) Drills and Training on Davit-Launched Liferafts. Marine Inspectors shall follow these guidelines and procedures for the evaluation of crew competency in handling of davit-launched liferafts. The focus is on evaluating the adequacy of the crew training.

NOTE: "Crew" or "crewmembers" mans those shipboard personnel on the vessel's muster list, whose assigned duties include launching or assisting in the launching of davit-launched liferafts.

(a) Applicability. This policy is applicable to all oceangoing passenger vessels that are subject to a CVE.

Implementation

(b) Implementation.

(i) Frequency of Training and Demonstrations.

Crew Training. Onboard training in the use of davit-launched liferafts should be conducted monthly on each vessel. Crewmembers should be rotated during these drills so that each member gets training at least once every four months, as required by SOLAS 74, Chapter III, Regulation 18.4.3 (1996 Amendments). This training should consist of inflating and lowering a davit-launched liferaft whenever practicable. This liferaft may be a special liferaft intended for training purposes only, which is not part of the ship's required lifesaving equipment. If such a liferaft is used, it shall be conspicuously marked as a training liferaft.

Initial and Annual CVES

Initial and Annual CVES. During initial and subsequent annual CVFS, each vessel shall be required to demonstrate, by means of a drill, the complete process of rigging, inflating, and lowering a davit-launched liferaft. If a training liferaft is not available for this demonstration, the following options shall apply:

Option 1. If a training liferaft is not available, Coast Guard inspectors may issue a requirement to complete the demonstration in the presence of a Coast Guard marine inspector within 30 days or upon arrival at the next U.S. port, whichever is later. If this option is chosen, Coast Guard inspectors shall question crewmembers on their assigned duties relating to the davit-launched liferafts and ask the person(s)-in-charge at a liferaft station to explain the complete rigging, inflation, and launching procedure.

Option 2. If a training liferaft is not available and when reasonable cause exists, Coast Guard inspectors may require an immediate demonstration using a liferaft that is part of the ship's regular lifesaving complement. in determining reasonable cause, the following factors may be considered:

- no documented evidence of crew training as required by SOLAS;
- performance of crew during previous liferaft drills;
- the general condition of the ship;
- overall crew performance during other emergency drills; or,
- other factors which indicate that the crew may not be satisfactorily trained.

Quarterly CVES

Quarterly CVES. During a quarterly CVE, Coast Guard inspectors shall examine the vessel's documentary evidence to verify that the liferaft training required by SOLAS has been conducted. Where there is reasonable cause to doubt the crew's ability to safely and effectively launch a davit-launched liferaft, Coast Guard inspectors may require a complete rigging, inflation, and lowering demonstration. The same factors for reasonable cause, as prescribed by paragraph ii) above, shall be applied in making this determination.

Test Procedure

(ii) Test Procedure. The following policy shall apply to all liferaft inflation and lowering demonstrations conducted during CVES:

- Before commencing a drill, Coast Guard inspectors shall discuss all details of the procedure with the vessel master.
- Coast Guard inspectors shall not require personnel to be in a liferaft while it is being deployed. However, the master may, at his discretion, choose

to put personnel in the liferaft while it is being launched or after it is in the water.

- The raft need not be lowered to the water and released from its hook.
- At the master's discretion, drills may be conducted using a liferaft out of the ship's lifesaving appliance complement. If a ship's service liferaft is to be used, the operator may wish to consider using one that is scheduled for annual servicing or its five-year inflation test. If such a raft is used, it shall be replaced prior to sailing.
- A training liferaft need not be the same make/model as those found in the ship's regular complement. However, it should be of at least 12-person capacity and have launching procedures similar to those for the ship's regular liferafts.

Documentation of Examinations

c. Documentation of Examinations. Marine Safety Information System (MSIS) entries for initial examinations, annual examinations and reexaminations are to be made in accordance with Section A.5 of this chapter.

Control Verification for Foreign Vessel, Form CG-4504

d. Control Verification for Foreign Vessel, Form CG-4504. Under 46 CFR 2.01-6, Control Verification for Foreign Vessel, Form CG-4504, is issued to foreign passenger vessels embarking or carrying passengers from U.S. ports. Upon successful completion of an initial or annual examination, such a vessel may be issued Form CG-4504. The Control Verification certificate shall be made effective for one year from the date of issue provided the vessel maintains a valid PSSC during that period. Issuance of this form to vessels of foreign countries that are party to SOLAS is not specifically authorized by the convention. When the owner of a foreign vessel objects to issuance of this form, the OCMI or the Captain of the Port (COTP) should explain that it provides for orderly administration of Coast Guard examinations and expedites entrance and clearance procedures for a foreign vessel calling at several U.S. ports. However, its issuance is not required by law.

Reexaminations

(1) Reexaminations. Form CG-4504 need not be reissued at the conclusion of a reexamination. If minor deficiencies are identified during the reexamination, the master should be provided with a worklist which clearly explains the corrective measures that must be taken. See chapter D2 for additional information.

Administration

(2) Administration. Form CG-4504 shall not be amended. When changes in the vessel's condition occur, a new form shall be issued. The replacement form shall contain the statement, "This replaces Form CG-4504 dated," and shall have the same expiration date as the original form. A copy of the replacement form shall be forwarded to the OCMI who issued the original.

Revocation

(3) Revocation. Form CG-4504 may be revoked for sufficient cause. However, before this occurs, the vessel's representative should be given every reasonable opportunity to correct deficient conditions. It is

anticipated that revocation will usually accompany a detention under Regulation 19, Chapter I of SOLAS. The revoked form shall be removed from the vessel. The master or nearest consular representative of the home administration shall be advised of the reasons for revocation in writing. The local Collector of Customs should also be advised of the revocation. See Chapter D2 of this volume for additional guidance on control measures.

Examination of Cargo Vessels Which Carry Up To 12 Persons In Addition To The Crew.

e. All cargo vessels of countries party to SOLAS that embark and carry up to 12 passengers from a port of the U.S. shall be examined at their first U.S. port of call and at least annually thereafter. Cargo vessels that embark and carry up to 12 passengers from a port of the U.S. need not undergo quarterly reexaminations. However, the vessel may be targeted for reexaminations in accordance with the procedures outlined in Chapter D4. The Marine Safety Information System (MSIS) procedures applicable to freight vessels, as discussed in Chapter D5 of this volume, shall also be followed.

Scope of Examination

(1) Scope of Examination. The procedures applicable to the examination of foreign freight vessels will be used when examining cargo vessels carrying up to 12 persons in addition to the crew, except that the examination shall also verify that safe facilities are provided for the persons in addition to the crew. The Foreign Freight Vessel Examination Book should be used. It is important to remember that the vessel is being examined as a freight vessel, not a passenger vessel. Detention or other control action should be exercised if the vessel is unfit to proceed to sea or an unreasonable risk to the environment. However, the inspector may not specifically prohibit the carriage of persons in addition to the crew and then allow the vessel to sail with a crew on board. If the vessel is unsafe, it is also unsafe for the crew.

Fire and Boat Drills

(2) Fire and Boat Drills. Drills are to be conducted during annual examinations. However, they should not normally be required during reexamination. They may be required whenever there is reason to question the condition of equipment or the efficiency of operation. If conditions warrant that drills be conducted during a reexamination, a marine inspector should be called in to witness the drills.

Marine Safety Information System (MSIS).

(3) Marine Safety Information System (MSIS). MSIS entries are to be made in accordance with the procedures for documenting freight vessel examinations in MSM II-D5.G.1.

D. MSIS

Passenger vessel examinations and reexaminations will be documented in MSIS by filing a Marine Inspection Activity Report (MIAR). To ensure the accuracy of the database used in making boarding decisions:

- The inspection type "COC/CVE" (Control Verification Exam) is used for both initial and annual control verification examinations. The code "COC/CVQ (Control Verification Quarterly) is used for all passenger vessel reexaminations.

- The certificate codes "ISS" (issue) for an initial exam, "RIS" (reissue) for an annual exam, and "NON" (none) for reexaminations are entered as appropriate.

- Outstanding discrepancies and any significant discrepancies corrected during the boarding must be entered in the Marine Inspection Deficiency Report (MIDR) product set.

- Update the Vessel File Involved Party (VFIP) product set if different from that observed aboard the vessel. If a vessel's classification society is not listed or differs from that shown in VFIP, enter the appropriate classification society using the Involved Party Numbers (IPN) listed in MSM II-D4B.3.e. The "OWNER" indicated in the VFIP should match that indicated on the vessel's registry. The "OPERATOR" indicated in the VFIP should match that indicated on the vessel's Certificate of Financial Responsibility (COFR). Ensure that addresses are accurate.

- The Vessel File List of Documents (VFLD) product set should be updated to reflect the status of the vessel's documents. The initial and annual examinations will automatically map over to VFLD.

- Boardings shall be scheduled in advance using the MSIS Marine Inspection Scheduler Function (MISF).

- MSIS entries including deficiencies are to be entered into MSIS within 48 hours of completing a boarding.

- If a vessel is expected to arrive within another OCMI or Captain of the Port zone of responsibility before MSIS can be updated, information regarding the boarding and any deficiencies or control action taken shall be relayed to the next port of call in the most expedient means available, (e.g. facsimile, telephone, E-mail etc.).

CHAPTER 1: MARPOL 73/78 VESSEL REQUIREMENTS

TABLE OF CONTENTS

A. INTRODUCTION

In 1973, the International Maritime Organization (IMO) adopted the International Convention for the Prevention of Pollution by Ships and subsequently modified it by Protocol in 1978. The Convention is known as MARPOL 73/78. Its objective is to limit shipborne pollution by restricting operational pollution and reducing the possibility of accidental pollution. Acceptance of the convention by national government obliges them to make the requirements part of domestic law.

MARPOL 73/78 consists of five separate annexes, each of which is designed to combat a particular class of pollutants. The five annexes are:

Regulations for the Prevention of Pollution from Ships, MARPOL 73/78	
Annex	**Title**
I	Regulations for the Prevention of Pollution by Oil
II	Regulations for the Control of Pollution by Noxious Liquid Substances (chemicals) in bulk
III	Regulations for the Prevention of Pollution by Harmful Substances in Packaged Form
IV	Regulations for the Prevention of Pollution by Sewage from Ships
V	Regulations for the Prevention of Pollution by Garbage from Ships
NOTE: Ship-generated garbage includes what we normally call trash.	

The United States has ratified Annexes I and II (both mandatory for nations party to the convention and already in force internationally), III, and V. Annexes III, IV, and V are the optional annexes, which require separate ratification by nations signatory to MARPOL 73/78. Each optional annex enters into force one year from the date on which at least fifteen nations, representing fifty percent of the world's shipping tonnage, have ratified them. Annex V entered into force on December 31, 1988, and Annex III on July 1, 1992. Annex IV has not met the tonnage requirement and is not yet scheduled to enter into force.

Information on MARPOL 73/78 or any other international maritime treaties, as well as country codes and signatory status, can be found in the MSIS International Maritime Entry Index product set (IMEI).

The guidance and instructions contained in this chapter describe the procedures to be followed by boarding officers for MARPOL 73/78. The enforcement guidance for MARPOL 73/78 Annex I discrepancies discovered during boardings is provided in Volume I, Chapter 4 of the Marine Safety Manual.

In-port inspections and examinations are the primary enforcement tool for detecting violations and ensuring MARPOL 73/78 compliance. Ships with MARPOL 73/78 discrepancies may be boarded a second time to ensure correction of the deficiency. Ships suspected of discharge violations shall be designated for high priority boarding at their first U.S. port of call.

A strong, fair, and consistent enforcement program is essential if MARPOL 73/78 is to achieve its goal of significantly reducing marine pollution from ships. To encourage ships to comply with MARPOL 73/78 requirements, the United States has set forth in the Act to Prevent Pollution from Ships (APPS) (33 U.S.C. 1901 et seq.) a civil penalty of not more than $25,000 for each violation. MARPOL 73/78 deficiencies discovered during a boarding shall be immediately reported to the ship's master or owner's representative. Additionally, for foreign flag ships immediately notify the consul or diplomatic representative of the flag country if the ship is to be denied further entry to port, if the ship is detained in port for twelve (12) hours or more, or if the ship does not have a valid IMO certificate or equivalent. A record of the notification should be maintained and the notification should state the specific offense, the corrective actions necessary, and the anticipated enforcement actions. See MSM II.D.2 for detailed guidance on how to exercise control of foreign vessels.

Each Marine Safety Office (MSO) should designate one person whose first and foremost responsibility will be to coordinate all MARPOL 73/78 activities. This MARPOL coordinator will oversee enforcement for Annexes I, II, III, and V and carry out the following functions:

1. Liaison

Maintain liaison with the following groups and ensure each is aware of its responsibilities with respect to MARPOL 73/78:

- U.S. Department of Agriculture Animal and Plant Health Inspection Service (APHIS) and Plant Protection and Quarantine (PPQ) personnel;
- Facility Managers;
- Port Authorities;
- Shipping Agents;
- Reception Facilities;
- Marina Owners/Operators;
- Reservists;
- Auxiliarists;
- Local CG Group and Station personnel; and
- National Marine Fisheries Service personnel.

2. Unit Activity Keep apprised of all MARPOL 73/78 activity for the unit including inspections, investigations and port operations activities.

3. Compliance Ensure that boarding officers are, during the normal course of their vessel inspections, checking for compliance with MARPOL and that this is noted in their inspection books. No less than quarterly, accompany personnel on boardings and facility inspections to ensure appropriate actions are being taken to measure compliance.

4. Violations Ensure that all MARPOL violations are properly entered into MSIS, and that any possible violation is thoroughly and accurately investigated and documented. Information on suspected violators for which insufficient evidence to support a violation is obtained should also be entered so that suspected violators can be flagged by other ports as possible sources of noncompliance.

5. Interaction Maintain positive and proactive interaction with APHIS and PPQ inspectors. When resources allow, these inspectors board every vessel arriving from a foreign port and are an extremely valuable resource to the MARPOL enforcement program. Conduct periodic MARPOL training at local APHIS offices. Ensure that inspectors are aware of the Coast Guard's interest in MARPOL V compliance and the importance of notifying the Coast Guard of possible violations and sending any evidence of noncompliance to the Coast Guard unit as soon as possible. Every four to six months, spend a day conducting vessel boardings with local inspectors to observe their procedures.

6. Facility Certificates of Adequacy (COA) Reexamine all waterfront facilities within the area and determine which are required to have a Certificate of Adequacy (COA) for each annex and whether the facility holds a valid COA. Maintain an updated list of those facilities holding COAs. Keep on file the most current Federal Register which lists reception facilities for reference.

7. Frequency of Inspections Ensure that all facilities holding a valid COA are inspected biannually to verify that the conditions claimed in the COA application are still valid. Problem facilities should be visited more frequently. All visit results should be recorded within MSIS with violations linked to the facility and the involved parties.

8. Facility Disposal Methods

Know each facility in the port - its waste disposal capability, shoreside disposal capability, methods for handling APHIS regulated waste, COA requirements, etc. Be responsive to reports of inadequacy by vessels. Thoroughly investigate the circumstances and take corrective action. Be aware of facility fees and overcharging for disposal services. Incidents of overcharging should be documented and reported to Headquarters via the district.

9. Unit Training

Conduct periodic unit training on MARPOL requirements, enforcement procedures, compliance and effective civil penalty case preparation. Invite APHIS inspectors to speak. Maintain good working relationship with your APHIS district representative, who is a good source of information regarding developing cases and providing sufficient evidence to support a violation.

10. Education / Training

Establish communication with and provide education/training for boating groups, fishing associations, Coast Guard Auxiliarists, National Marine Fisheries Service personnel and state enforcement agencies. Training should also be provided for the local Coast Guard group, small boat stations and cutters so that personnel will be able to recognize MARPOL violations, collect case evidence and educate mariners on discharge restrictions.

B. AUTHORITY

Annexes I, II and V have been incorporated into U.S. law by the Act to Prevent Pollution From Ships. This Act requires the Coast Guard to draft regulations and enforce the provisions of these MARPOL 73/78 Annexes. The regulations are contained in 33 CFR 151 for inspected vessels and 46 CFR for uninspected vessels. The regulations spell out specific ship-generated discharge restrictions for all vessels operating on all waters subject to U.S. jurisdiction. For U.S. vessels, the regulations apply wherever the vessel is operating. Regulations for reception facilities are contained in 33 CFR 158. Annex III was implemented by The Hazardous Materials Transportation Act (HMTA). The regulations are contained in 49 CFR 171, 172, 173, 174, and 176 for Harmful Substances Carried by Sea in Packaged Form or in Freight Containers, Portable Tanks or Road and Rail Tank Wagons. The regulations list the criteria for the designation, description, and classification of those hazardous materials.

C. DEFINITIONS

The following definitions are provided to assist in understanding the terminology associated with the regulatory requirements for enforcing the provisions of MARPOL 73/78. Where the words being defined are enclosed by quotation marks ("..."), the definitions are quoted directly from applicable statutes, international conventions, or regulations. The appropriate citation is provided in brackets [ ]. Headings without quotation marks do not have a referenced citation. "CFR" stands for Code of Federal Regulations, and "U.S.C." stands for United States Code.

1. Adequate Reception Facility

"Adequate reception facility" means each facility certified as adequate under 33 CFR 158.160 and each facility provided by an administration signatory to MARPOL 73/78 under Regulation 7 of Annex II. [46 CFR 153.2]

2. Administration

"Administration" means the Government of the state under whose authority the ship is operating. For fixed or floating platforms engaged in exploration and exploitation of the coastal seabed and subsoil, the Administration is the Government of the coastal state exercising sovereign rights for the purpose of exploration and exploitation of their natural resources. [Art. 2(5) MARPOL 73/78]

3. Animal and Plant Health Inspection Service (APHIS)

Animal and Plant Health Inspection Service (APHIS) operates under the Department of Agriculture. Its local officers board U.S. and foreign vessels upon arrival at U.S. ports to enforce the sanitation and health regulations with regard to foreign food and plants. These officers are known as Plant Protection and Quarantine (PPQ) officers.

4. Ash and Clinkers Handling

Ash and clinkers are the by-product of shipboard incinerators and coal-burning boilers and are considered operational wastes. The term clinker can also be used to refer to plastic residue or pieces which have not been fully reduced to ash by incineration or barrel burning. Plastic clinkers shall be treated as plastic and retained aboard ship for discharge at port reception facilities.

5. Built

"Built" means that a ship's construction has reached any of the following stages:

a. The keel is laid.

b. The mass of the partially assembled ship is 50,000 kg.

c. The mass of the partially assembled ship is one percent of the estimated mass of the completed ship. [46 CFR 153.2]

6. Cargo Associated Wastes

"Cargo associated wastes" means all materials which have become wastes as a result of use on board ship for cargo stowage and handling. Cargo associated wastes include, but are not limited to dunnage, shoring, pallets, lining and packing materials, plywood, paper, cardboard, wire, and steel strapping. [33 CFR 151.05]

7. Cargo Residue and Sweepings

Cargo residues or sweepings are defined as the remnants of any cargo material on board that cannot be placed in proper cargo holds (loading excess or spillage) or which remain in cargo holds and elsewhere after unloading procedures are completed (unloading residual and spillage). However, cargo residues are expected to be in small quantities. They are to be treated as garbage under Annex V and subject to the same restrictions, except when those residues or sweepings are substances defined or listed under the other annexes to the MARPOL convention.

8. Certificate of Adequacy (COA)

"Certificate of Adequacy (COA)" means a document issued by the Coast Guard or other authorized agency that certifies a port or terminal meets the requirements of this part with respect to reception facilities under the Act (to Prevent Pollution from Ships (33 U.S.C. 1901 et seq.)) and MARPOL 73/78, and has Form A, Form B, or Form C attached. [33 CFR 158.120]

9. Commercial Fishing Facility

"Commercial fishing facility" means docks, piers, processing houses or other facilities which receive commercial fishery products from ships. [33 CFR 158.120]

10. Daily Vessel Average

"Daily vessel average" means the total number of oceangoing tankers, or any other oceangoing ships of 400 gross tons or more, carrying residues and mixtures containing oil, serviced over a typical continuous 12 month period, divided by 365. [33 CFR 158.120]

11. Discharge "Discharge" as defined by MARPOL 73/78 in relation the harmful substances or effluent containing such substances, means any release, however caused from a ship, and includes any escape, disposal, spilling, leaking, pumping, emitting or emptying. It does not include:

a. Dumping within the meaning of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter, done at London on November 13, 1972; or

b. Release directly arising from the exploration, exploitation, and associated offshore processing of seabed mineral resources; or

c. Release for purposes of legitimate scientific research into pollution abatement or control. [33 CFR 151.05]

12. Dishwater "Dishwater" means the liquid residue from the manual or automatic washing of dishes and cooking utensils which have been pre-cleaned to the extent that any food particles adhering to them would not normally interfere with the operation of automatic dishwashers. [33 CFR 151.05]

13. Equivalent Equivalent means an alternative for a fitting, material, appliance or apparatus allowed by the Administration which at a minimum is as effective as the MARPOL 73/78 requirement. An equivalent shall not include the substitution of an operational method to effect the control of discharge of oil for design and construction features required by MARPOL 73/78.

14. Existing Ship "Existing ship" means any ship which is not a "new ship." [33 CFR 151.05]

15. Form A "Form A" means the application for a reception facility Certificate of Adequacy for Oil, as approved by OMB, Coast Guard Form USCG-CG-5401(A)(9-85). [33 CFR 158.120] (OMB Approval No. 2415-D543) Form A is also an IOPP supplement.

16. Form B "Form B" means the application for a reception facility Certificate of Adequacy for NLS, Coast Guard Form USCG-CG-5401(B)(2-87). [E1 CFR 158.120] (as approved by OMB). Form B is also an IOPP supplement.

17. Form C

"Form C" means the application for a Certificate of Adequacy for a Reception Facility for Garbage, Coast Guard Form USCG-CG-5401(C). [33 CFR 158.120]

18. Garbage

"Garbage" means all kinds of victual, domestic and operational waste, excluding fresh fish and parts thereof, generated during the normal operation of the ship and liable to be disposed of continuously or periodically, except dishwater, graywater, and those substances that are defined or listed in other annexes to MARPOL 73/78. [33 CFR 151.05]

19. Graywater

"Graywater" means drainage from dishwasher, shower, laundry, bath, and wash basin drains and does not include drainage from toilets, urinals, hospitals, and cargo spaces. [33 CFR 151.05]

20. Harmful Substance

"Harmful substance" means any substance which, if introduced into the sea, is liable to create hazards to human health, harm living resources and marine life, damage amenities or interfere with other legitimate uses of the sea, and includes any substance subject to control by MARPOL 73/78. [33 CFR 158.120 and 151.05]

21. Hazardous Material

Hazardous material means a liquid material or substance that is:

a. Flammable or combustible;

b. Designated a hazardous substance under section 311(b) of the Federal Water Pollution Control Act (E1 U.S.C. 1321); or

c. Designated a hazardous material under section 104 of the Hazardous Material Transportation Act (HMTA) (49 U.S.C. app. 1803). [46 U.S.C. 2101(14)]

NOTE: The Environmental Protection Agency designates hazardous substances in 40 CFR, Table 116-4.a. The Coast Guard designates hazardous materials that are transported as bulk liquids by water in 46 CFR 153.

22. High Viscosity NLS

"High viscosity NLS" includes Category A NLSs having a viscosity of at least 25 mPa.s at 20oC and at least 25 mPa.s at the time they are unloaded, high viscosity Category B NLSs and high viscosity Category C NLSs. [33 CFR 158.120]

23. High Viscosity Category B NLS

"High viscosity Category B NLS" means any Category B NLS having a viscosity of at least 25 mPa.s at 20oC and at least 25 mPa.s at the time it is unloaded. [33 CFR 158.120]

24. High Viscosity Category C NLS

"High viscosity Category C NLS" means any Category C NLS having a viscosity of at least 60 mPa.s at 20oC and at least 60 mPa.s at the time it is unloaded. [33 CFR 158.120]

25. IMO Bulk Chemical Code

IMO Bulk Chemical Code includes the IMO International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Resolution MEPC 19(22), 1985 and the IMO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Resolution MEPC 20(22), 1985.

26. IMO Certificates

IMO certificates includes a Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk issued under the IMO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Resolution MEPC 20(22), 1985 and an International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk issued under the IMO International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Resolution MEPC 19(22), 1985.

27. International Oil Pollution Prevention (IOPP) Certificate

International Oil Pollution Prevention (IOPP) Certificate means a Certificate issued to a ship by an Administration party to MARPOL 73/78 after successful completion of a survey to insure compliance with MARPOL 73/78 requirements. An IOPP Certificate is only issued to ships whose flag state is a party to MARPOL 73/78.

28. IOPP Certificate Equivalency IOPP certificate equivalency means valid documentation showing that a non-Party ship has been surveyed in accordance with and complies with the requirements of MARPOL 73/78. Evidence of compliance may be issued by either the government of a country or a recognized classification society. The evidence of compliance must contain all of the information in and have substantially the same format as the IOPP Certificate, Form A or Form B as appropriate.

29. Liquid "Liquid" means each substance having a vapor pressure of 172 kPa or less at 37.8°C. [46 CFR 153.2]

30. MARPOL 73/78 "MARPOL 73/78" means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto. [33 CFR 151.05]

31. Maintenance Waste "Maintenance waste" means materials collected while maintaining and operating the ship, including, but not limited to, soot, machinery deposits, scraped paint, deck sweepings, wiping wastes, and rags. [33 CFR 151.05]

32. Medical Waste "Medical waste" means isolation wastes, infectious agents, human blood and blood products, pathological wastes, sharps, body parts, contaminated bedding, surgical wastes and potentially contaminated laboratory wastes, dialysis wastes, and such additional medical items as prescribed by the Administrator of the EPA by regulation. [33 CFR 151.05]

E1. Mineral and Oil Industry Shorebase "Mineral and oil industry shorebase" means a place or onshore structure or facility which is a base of operations for ships serving the mineral and oil industry. [E1 CFR 158.120]

34. Nearest Land "Nearest land" has the same meaning as in 33 CFR 151.05.

35. New Ship

"New ship" means a ship:

a. For which the building contract is placed after 31 December 1975;

b. In the absence of a building contract, the keel of which is laid or which is at a similar stage of construction after 30 June 1976;

c. The delivery of which is after 31 December 1979; or

d. Which has undergone a major conversion:

(1) For which the contract is placed after 31 December 1975;

(2) In the absence of a contract, the construction work of which is begun after 30 June 1976; or

(3) That is completed after 31 December 1979. [33 CFR 151.05]

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36. Non-Party

Non-Party means a country which has not ratified MARPOL 73/78 or Annex V of MARPOL 73/78.

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37. Noxious Liquid Substance (NLS)

Noxious Liquid Substance (NLS) means:

a. Each substance listed in 33 CFR 151.47 or 33 CFR 151.49;

b. Each substance having an "A", "B", "C" or "D" beside its name in the column headed "Pollution Category" in Table 1 of 46 CFR 153; and

c. Each substance that is identified as an NLS in a written permission issued under 46 CFR 153.900(d). [33 CFR 158.120]

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38. Oceangoing Ship

"Oceangoing ship" means a ship that:

a. Is operated under the authority of the United States and engages in international voyages;

b. Is operated under the authority of the United States and is certificated for ocean service;

c. Is operated under the authority of the United States and is certificated for coastwise service beyond 4.8 kilometers (3 miles) from land;

NOTE: A Canadian or U.S. ship being operated exclusively on the Great Lakes of North America or their connecting and tributary waters, or exclusively on the internal waters of the United States and Canada, is not an "oceangoing" ship. [33 CFR 151.05]

d. Is operated under the authority of the United states and operates at any time seaward of the outermost boundary of the territorial sea of the United States as defined in 33 CFR 2.05; or

e. Is operated under the authority of a country other than the United States.

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39. Oil

Oil means petroleum in any form including crude oil, fuel oil, sludge, oil refuse, and refined products. "Oil" does not include animal or vegetable based oil nor does it include noxious liquid substances designated under Annex II of MARPOL 73/78.

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40. Oily Mixture

"Oily mixture" means an oily mixture with any oil content, including bilge slops, oily wastes, oil residues (sludge), oily ballast water, and washings from cargo oil tanks.

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41. Operational Waste

"Operational waste" means all cargo associated waste, maintenance waste, cargo residues, and ashes and clinkers from shipboard incinerators and coal burning boilers. [33 CFR 151.05]

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42. Owner

"Owner" means any person holding title to, or in the absence of title, any other indicia of ownership of, a ship or terminal, but does not include a person who, without participating in the management or operation of a ship or terminal, holds indicia of ownership primarily to protect a security interest in the ship or terminal. [33 U.S.C. 1901(2)(8)]

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43. Party "Party" means a ratifying country to MARPOL 73/78 and Annex V of MARPOL 73/78.

44. Person "Person" means an individual, firm, public or private corporation, partnership, association, State, municipality, commission, political subdivision of a State, or any interstate body. [33 CFR 151.05]

45. Person in Charge " Person-in-Charge (PIC)" means an owner, operator, or person authorized to act on behalf of a port or terminal. [33 CFR 158.120]

> **NOTE:** The "person in charge" in this part is not necessarily the same person as the "person in charge" referred to in 33 CFR Parts 151, 154, 155, and 156 (as defined in 33 CFR 154.105).

46. Plastic "Plastic" means any garbage that is solid material that contains as an essential ingredient one or more synthetic organic high polymers and is formed or shaped during either manufacture of the polymer or fabrication into a finished product by heat or pressure or both. "Degradable" plastics, which are composed of combinations of degradable starches and are either (a) synthetically produced or (b) naturally produced but harvested and adapted for use, are plastics under this part. [33 CFR 151.05] Degradable plastic products on the commercial market are considered plastic within the context of MARPOL enforcement.

47. Port "Port" means:

a. A group of terminals that combine to act as a unit and be considered a port for the purposes of this part;

b. A port authority or other organization that chooses to be considered a port for the purposes of this part; or

c. A place or facility that has been specifically designated as a port by the Captain of the Port (COTP). [33 CFR 158.120]

48. Public Vessel Public vessel means any warship, naval auxiliary or other ship owned or operated by a country and engaged in non-commercial service.

49. Reception Facility "Reception facility" means anything capable of receiving shipboard residues and mixtures containing oil or NLS residue, or receiving garbage, including, but not limited to:

a. Fixed piping that conveys residues and mixtures from the ship to a storage or treatment system;

b. Tank barges, railroad cars, tank trucks, or other mobile facilities;

c. Containers or other receptacles that are used as temporary storage for garbage; or

d. Any combination of fixed and mobile facilities. [33 CFR 158.120]

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50. Recreational Boating Facility "Recreational boating facility" means a facility that is capable of providing wharfage or other services for 10 or more recreational vessels. It includes, but is not limited to, marinas, boatyards, and yacht clubs, but does not include a place or facility containing only an unattended launching ramp. [33 CFR 158.120]

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51. Regulated NLS Cargo "Regulated NLS cargo" includes each Category A or high viscosity or solidifying Category B or C NLS cargo listed in Table 1 of 46 CFR Part 153 that contains a reference to 153.908(a) or 153.908(b) in the "Special Requirements" column of that table and is unloaded at the port or terminal within a typical continuous 12 month period either before or after application is made for a Certificate of Adequacy. [33 CFR 158.120]

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52. Residues and Mixtures "Residues and mixtures containing NLSs (NLS residue)" means:

a. Any Category A, B, C, or D NLS cargo retained on the ship because it fails to meet consignee specifications;

b. Any part of a Category A, B, C, or D NLS cargo remaining on the ship after the NLS is discharged to the consignee, including but not limited to puddles on the tank bottom and in sumps, clingage in the tanks, and substance remaining in the pipes; or

c. Any material contaminated with Category A, B, C, or D NLS cargo, including but not limited to bilge slops, ballast, hose drip pan contents, and tanks wash water. [33 CFR 151.05]

53. Ship "Ship" means a vessel of any type whatsoever, operating in the marine environment. This includes hydrofoils, air-cushion vehicles, submersibles, floating craft whether self-propelled or not, and fixed or floating drilling rigs and other platforms. [33 CFR 151.05]

54. Slop Tank "Slop tank" includes slop tanks and cargo tanks used a slop tanks. [46 CFR 153.2]

55. Solidifying NLS "Solidifying NLS" means a Category A, B, or C NLS that has a melting point:

a. Greater than 0°C but less than 15°C and a temperature, measured under the procedure in 46 CFR 153.908(d), that is less than 5°C above its melting point at the time it is unloaded; or

b. 15°C or greater and has a temperature, measured under the procedure in 46 CFR 153.908(d), that is less than 10°C above its melting point at the time it is unloaded. [33 CFR 158.120]

56. Special Area "Special area" means a sea area where, for recognized technical reasons in relation to its oceanographical and ecological condition and to the particular character of its traffic, the adoption of special mandatory methods for the prevention of sea pollution by oil, NLS or garbage is required. Special areas for the purposes of Annex I of MARPOL 73/78 include those listed in 33 CFR 151.13 and for the purposes of Annex V of MARPOL 73/78 include those listed in 33 CFR 151.53. [33 CFR 151.05]

57. Tank Barge "Tank barge" means a tank vessel not equipped with a means of self-propulsion. [33 CFR 157.03(u)]

58. Terminal "Terminal" means an onshore facility or an offshore structure located in the navigable waters of the United States or subject to the jurisdiction of the United States and used, or intended to be used, as a port or facility for the transfer or other handling of a harmful substance. [33 CFR 158.120]

> **NOTE:** A ship repair yard is a terminal by definition. A fixed or floating drilling rig or other platform is not a terminal because it is by definition, a "ship" under 33 CFR 151.05(q). The Coast Guard interprets commercial fishing facilities, and mineral and oil industry shorebases to be terminals for the purposes of Annex V of MARPOL 73/78, since these facilities normally provide wharfage and other services, including garbage handling, for ships.

59. The Act "The Act" means the Act to Prevent Pollution from Ships (94 Stat. 2297, 33 U.S.C. 1901 et seq.). [33 CFR 158.120]

60. Victual Waste

"Victual waste" means any spoiled or unspoiled food waste. [33 CFR 151.05]

D. MARPOL 73/78 ANNEX I BOARDING GUIDANCE AND PROCEDURES

MSOs and COTPs will check oil tankers of 150 GT or more and other ships of 400 GT or more for Annex I compliance by reviewing the ship's International Oil Pollution Prevention (IOPP) Certificate or equivalency, Oil Record Book(s), oil discharge monitor records, and subdivision and stability documents and calculations. Boarding officers may use the Annex I Boarding Checklist provided in Figure E1-1 to aid them in an Annex I compliance check. Enforcement guidance for Annex I violations is provided in chapter 4 of volume I of the Marine Safety Manual.

1. IOPP Certification Review

The first step in checking a ship engaged in oceangoing trade for Annex I compliance is to review the ship's IOPP certification. The IOPP Certificate for Parties and the IOPP Certificate equivalency for non-Parties provides a means to easily determine if a ship has all of the required Annex I equipment on board and functioning. A ship having valid IOPP certification is not exempt from other port and environmental safety boardings, but having valid IOPP certification will limit the Annex I segment of the boarding to review of the IOPP certification, the Oil Record Book, the monitor continuous recordings, and stability information (MARPOL 73/78 Annex I Article 5(2)), unless there is clear evidence that the ship is not in compliance with the IOPP certification.

The IOPP Certificate for Parties is composed of two parts. The one page Certificate shows the expiration date and the dates, places, and persons completing required surveys. The second part is either the Form A Supplement, Record of Construction and Equipment for Ships Other than Oil Tankers, or the Form B Supplement, Record of Construction and Equipment for Oil Tankers. The Form A and B Supplements provide specific information on the ship and its pollution prevention equipment. Copies of the IOPP Certificate and the Form A and Form B Supplements are provided as Figures E1-2, E1-3 and E1-4.

a. Ship Requirements For IOPP Certification. Coast Guard Marine Inspectors using the guidance in NVIC 7-83 conduct the MARPOL 73/78 Annex I surveys and issue the IOPP Certificates for U.S. ships. IOPP surveys of U.S. inspected ships will coincide with regularly scheduled inspections unless required earlier. IOPP Certificate surveys of U.S. uninspected ships are performed only upon request. Enforcement guidance for public vessels not carrying a valid IOPP Certificate is found in chapter 31 of Volume II of the Marine Safety Manual.

(1) U.S. Ships.

(a) Each U.S. oil tanker of 150 gross tons and above, and each other U.S. ship of 400 gross tons and above, that engages in voyages to ports or offshore terminals under the jurisdiction of other parties to MARPOL 73/78 must have a valid IOPP Certificate.

(b) Inspected ships engaged solely in coast wise trade are not required to have an IOPP Certificate since they are not making an international voyage, but must have the Form A or Form B Supplement, as appropriate. However, as required by 33 CFR 151, 155, and 157 and in accordance with the policy stated in NVIC 7-83, these ships are required to have MARPOL 73/78 pollution prevention equipment on board and functioning.

(c) Uninspected oceangoing ships not visiting foreign ports do not need an IOPP Certificate; however, as required by 33 CFR 151, 155, and 157 and in accordance with the policy stated in NVIC 7-83, these ships are required to have MARPOL 73/78 pollution prevention equipment on board and functioning.

(2) Foreign Ships. All foreign ships within the gross tonnages designated are required without exception, to have on board an IOPP Certificate or IOPP Certificate equivalent.

FIGURE E1-1: MARPOL ANNEX I BOARDING CHECKLIST

NOTE: *Intended as review only.*

1. Review IOPP Certificate.
   - Is certificate valid?
   - Does vessel name and registry match certificate?
   - Is equipment required in Form A or Form B on board and functioning?
   - Are there any outstanding Notices of Merchant Marine Inspection Requirements (CG-835) or deficiencies indicated in MSIS?
   - Are any "equivalents" listed in section 6 of Form A or section 10 of Form B acceptable to the U.S.?

2. Review Oil Record Book.
   - Does vessel maintain required Oil Record Books? (All ships Part I, Oil Tankers Parts and II)
   - Has each entry been signed by the officer in charge and each page signed by the master?
   - Are oil transfer entries in the proper format?
   - Verify location and concentration of last discharge entry.
   - Review for the last voyage all expected entries such as tank cleaning, ballasting and deballasting.

3. Monitor Continuous Record Review.
   - Does vessel have available on board the continuous records for: the past year for cargo records and the past three years for machinery bilge space records?
   - Were the date, time and concentration of discharges from the most recent voyage recorded in the continuous record (Oil Record Book)?
   - Verify that the location and concentration of the last discharge are authorized.
   - Compare the last discharge recorded with the companion entry in the Oil Record Book.
   - Did vessel arrive in ballast and deballast while in port? Do the deballasting entries in Oil Record Book correspond to monitor recording?
   - If monitor is inoperative, does Oil Record Book indicate the problem and any corrective actions?
   - Do entries match equipment listed on IOPP Certificate?

4. Damage Stability Information Review.
   - Record forward, midships and after drafts you observe when boarding the ship.
   - Ask the master to describe loading of the cargo tanks in terms of percent of tank full.
   - Review the vessel's Trim and Stability Booklet (Loading Manual). If there is no stability Information available, this is considered a major deficiency.
   - Compare the cargo tank levels given by the master and the observed drafts to those obtained from the Trim and Stability Booklet or Loading Booklet.
   - Ask the ship's officer to explain any discrepancies.

ANY DISCREPANCIES NOTED SHOULD INITIATE A MORE THOROUGH REVIEW AS DESCRIBED IN VOLUME II, SECTION E, CHAPTER 1.D.4.b, OF THE MARINE SAFETY MANUAL.

b. IOPP Certification Boarding Procedures. Review the ship's Certificate of Inspection or other documents when conducting the annual foreign oil tanker examination and during other boarding as required by Commandant Instruction 5010.A to determine if the ship should have IOPP certification based upon its trade, tonnage, age, and the other requirements. If the ship has IOPP certification review the following items to determine if the IOPP certification is valid (33 CFR 151.19(e)) and correct:

(1) Compare the name and the registry of the ship on the front of the IOPP certification to the ship's name and flag.

(2) Check the certification date, and the signature of the issuing officer on the front of the IOPP certification.

(3) Check the back of the IOPP certification for the timely completion of required surveys and the proper recording of the entries.

(4) Check the Form A or Form B Supplements to ensure all equipment is on board and operational, the entries are properly completed and signed, and to determine if the ship has monitoring equipment which provides a continuous record of discharges.

(5) For U.S. ships check the Coast Guard Vessel Inspection Record (CG-2832), normally kept on the bridge, to see if there are any IOPP Certificate requirements outstanding as noted in a Notice of Merchant Marine Inspection Requirements (CG-835).

(6) Check to determine if "equivalents" in Section 6 of Form A or in section 10 of Form B are acceptable to the United States. This may require contacting Commandant (G-MOC-2) at (202) 267-0972 or the Headquarters Command Center during non-duty hours at (202) 267-2101.

2. Oil Record Book (ORB) Review

The purpose of the ORB is to record all shipboard oil transfer and discharge operations. An improperly kept ORB may be used as evidence against a ship suspected of an illegal oil discharge, while a correctly maintained record could establish a successful defense to an alleged violation.

The ORB follows an internationally accepted format which records transfer operations in chronological order by coded and numbered entries. The old ORB required under the 1954 Convention for the Prevention of Pollution of the Sea by Oil is discontinued and unacceptable for recording oil transfer activities. Information on the correct procedures and practices for making entries in the new ORB are contained in enclosure (3) to NVIC 8-83. This information was adapted from IMO Marine Environment Protection Committee Circular 111.

The ship's master is responsible for properly maintaining the ORB and for ensuring its availability on board the ship for review. An entry in the ORB must be completed after every tank-to-tank operation. The officer(s) in charge shall sign each completed operation and the ship's master shall countersign each completed page. Ships are to keep the ORB on board for a period of three years after the date of the final entry.

Figure E1-4 - To be Added later in Electronic Version

a. Oil Record Book Requirements. Oceangoing oil tankers of 150 GT and above and all other oceangoing ships 400 GT and above, without regard to the ship's age, are required to maintain the ORB (33 CFR 151.25).

(1) U.S. Ships. U.S. ships are required to obtain the new U.S. version of the ORB (yellow cover) from MSO/COTP/MIO's. The U.S. version of the ORB contains both Part I for Machinery Space Operations and Part II for Cargo/Ballast Operations in a single volume. Because both parts are in the same book, oil tankers and ships with bulk oil cargo spaces having an aggregate capacity of 200 cubic meters or more must maintain one ORB solely dedicated to machinery space operations and another ORB solely dedicated to cargo/ballast operations. Other ships only have to maintain one ORB for machinery space operations.

(2) Foreign Party Ships. Foreign Party ships are required to use their country's version of the ORB. It is known that some Parties are publishing Part I and Part II of the ORB separately. The ORB is acceptable whether published together as a single volume or in two separate volumes.

(3) Non-Party Ships. Non-Party ships are required to have on board and maintain the ORB. Any equivalent format which provides the same information as the ORB is acceptable.

b. Oil Record Book Boarding Procedures. The ship's ORB shall be reviewed as part of the standard boarding procedures to ensure the ship's personnel are properly recording all oil transfers and discharges. Review of the following items will assure the ORB is properly kept and may assist in detecting whether any unauthorized discharge has occurred.

(1) Check whether the ship is using the ORB or equivalent.

(2) Check whether the ship is maintaining the ORB Parts required (All ships Part I; Oil tankers Parts I and II).

(3) Check entries in the ORB for the signature of the master on each page and the signature of the officer in charge for each entry.

(4) Check transfer entries for correct recording (proper format).

(5) Check the last discharge entry recorded to verify the location and the concentration of the discharge.

(6) Review, as appropriate, entries for the last voyage to determine if all of the expected entries have been made, especially with regard to tank cleaning, ballasting and deballasting.

3. Monitor Continuous Record Review

Monitors producing a continuous record showing the date and concentration of oil discharges are an important enforcement tool for ensuring ships comply with MARPOL 73/78 discharge restrictions. For ships equipped with monitors, the continuous recordings should be reviewed each time the ship is boarded to verify proper functioning of the device and that oil discharges are in accordance with MARPOL 73/78.

a. Monitor Requirements. The following paragraph describes the MARPOL 73/78 requirements for monitors with automatic recording devices.

(1) Machinery Space Bilge And Fuel Oil Tank Monitors. Oceangoing new ships of 400 GT and above may have monitoring devices installed for discharging machinery space bilge and fuel oil tank wastes (see E1 CFR 155.370). The ship's IOPP certification should be checked to determine whether the ship must have an automatic recording device installed and functioning for MARPOL 73/78 compliance. If the ship has a monitor with an automatic recording device, the continuous records are to be kept on board for three years from the date of the last entry.

(2) Cargo Area and Pumproom Monitors. All oil tankers of 150 GT or more or other ships with bulk cargo spaces having an aggregate capacity of 200 cubic meters or more are required to have oil discharge monitors with automatic recording devices on board and operating. The ship's IOPP certification should be checked to determine if the ship has an automatic device installed and functioning. The monitor continuous records are to be kept on board for one year from the date of the last entry and be available for review for three years from the date of the last entry.

b. Monitor Continuous Record Boarding Procedures. The ship's monitor continuous recordings should be reviewed as part of the standard boarding procedures. Review the following items to ensure that the equipment is properly functioning and that discharges are within MARPOL 73/78 limits. If an unauthorized discharge is indicated by the monitor records, additional evidence of the discharge must be obtained to support submission of a discharge violation for civil penalty proceeding or for referral to another flag state.

(1) Check if the ship has available on board the continuous records for the periods required i.e., one year for cargo records and three years for machinery bilge space records.

(2) Check the monitor continuous record from the most recent voyage for the date, time and concentration of discharges entered on the automatic printout or chart paper (should be machine recorded).

(3) Check the last discharge on the continuous record to determine if the concentration discharged and the location of the discharge is authorized.

(4) Compare the last discharge recorded on the monitor continuous recording to the companion entry in the Oil Record Book.

(5) Check whether the ship arrived in ballast and whether the ORB deballasting entries correspond to the monitor recording, including the time and taking into account the monitor's capacity.

(6) If the monitor is inoperative or indicates a discharge in excess of MARPOL 73/78 limits, check the Oil Record Book to determine whether there have been any problems with the monitor and what action the ship has taken to correct the problems.

(7) If an unauthorized discharge is indicated by the monitor continuous records, conduct a more thorough review as described in section E1.D.4.b.

4. Alleged Discharge Violation Investigation

Discharge boardings conducted as a result of an oil sighting report by Coast Guard units or other individuals or countries require a thorough review of the ORB, monitor continuous recordings, pollution prevention equipment operation, and ship spaces together with interviewing the ship's personnel to determine whether the suspected ship discharged in violation of MARPOL 73/78. Enforcement guidance for Annex I discharge violations is provided in chapter 4 of volume I of the Marine Safety Manual.

a. Discharge Requirements. ALL SHIPS must comply with the discharge limitations as described in the following sections. A summary of the discharge requirements for MARPOL 73/78 is provided as Figures E1-5 and E1-6. All unauthorized discharges shall be reported without delay as stated in 33 CFR 153.203 and 33 CFR 151.15.

(1) U.S. Territorial Sea. The FWPCA prohibits the discharge of oil in a "quantity which may be harmful" into the navigable waters of the United States, which includes the territorial sea (0 to 3 nautical miles (nm) offshore). Under the FWPCA, the EPA has defined a "quantity which may be harmful" as one which forms a sheen, sludge, film or emulsion (40 CFR 110). Therefore, any discharge in the territorial sea which creates a sheen, even if allowed by MARPOL 73/78, is a violation of the FWPCA. If the discharge is greater than 15 parts per million (ppm), it is also a violation of MARPOL 73/78.

(2) U.S. Contiguous Zone. The U.S. contiguous zone is the area between 3 and 12 nautical miles offshore as measured from the baseline from which the territorial sea is measured. In the contiguous zone oil discharges are restricted by the FWPCA and MARPOL 73/78. The FWPCA prohibits any discharge of oil in a quantity which may be harmful as defined in 4O CFR 110 (one which forms a sheen, sludge, film or emulsion), but excludes discharges permitted by MARPOL 73/78. MARPOL 73/78 permits discharges from machinery space bilges and oil fuel tanks in concentrations of less than 15 ppm when the ship has in operation an approved oily-water separator (33 CFR 151.10), and monitor or alarm system (33 CFR 155). Thus, discharges in the contiguous zone in compliance with MARPOL 73/78 restrictions are not a violation of the FWPCA, even if a sheen results. Discharges of 15 ppm should not produce a sheen, under most conditions.

(3) Discharges Beyond The Contiguous Zone. Beyond the contiguous zone, discharges of oil are presently limited only by MARPOL 73/78 except for discharges associated with Outer Continental Shelf drilling operations which are governed by National Pollution Discharge Elimination System (NPDES) permits issued by the EPA (40 CFR 435).

(a) Discharges From Machinery Space Bilges And Fuel Tanks. MARPOL 73/78 permits discharges from machinery space bilges and oil fuel tanks in concentrations of less than 100 ppm when the ship is proceeding en route, not within a special area (see Figure E1-6), more than 12nm from the nearest land, and when the ship has in operation an approved oily-water separator and for ships of 10,000 GT and above an approved bilge monitor or alarm system (33 CFR 151.10 and MARPOL 73/78 Annex I, Regulations 9 and 10).

(b) Discharges From Tanker Cargo Tanks And Cargo Pump Room Bilges. 33 CFR 157.37 permits discharges of oil from cargo tanks and cargo pump room bilges only when all of the following conditions are met:

(i) The tanker is not within a special area;

(ii) The tanker is more than 50 nm from the nearest land;

(iii) The tanker is proceeding en route;

(iv) The instantaneous rate of discharge of oil content does not exceed 60 litres per nautical mile;

(v) The total quantity of oil discharged into the sea does not exceed for existing tankers 1/15,000 of the total quantity of the particular cargo of which the residue formed a part, and for new tankers 1/30,000 of the total quantity of the particular cargo of which the residue formed a part; and

(vi) The tanker has in operation, except as allowed in 33 CFR 157.08(i), an approved oil discharge monitoring and control system.

(4) Fixed and Floating Drilling Rigs and Other Platforms. There are no additional equipment requirements or discharge limitations on fixed and floating drilling rigs and other platforms which are operating under a valid NPDES permit in accordance with section 402 of the FWPCA, as amended and with 40 CFR Chapter I. When not operating under a permit, the MARPOL 73/78 oil discharge limitations in 33 CFR 151.10 are fully applicable. Compliance with an NPDES permit is a fully satisfactory alternative to compliance with the requirements of MARPOL 73/78.

b. Alleged Discharge Violation Investigation Procedures. The following procedures should be followed when boarding a ship to investigate an alleged discharge violation.

(1) Inform the ship's master that his ship is suspected of discharging oil in violation of MARPOL 73/78 and/or the Act to Prevent Pollution from Ships.

(2) Review the IOPP certification for validity and to determine what pollution prevention equipment is on board.

(3) Review the discharge entries in the ORB for the period of the suspected unauthorized discharge to determine if the ship legally discharged at the time and in the location of the reported sighting.

(4) Review the continuous records from automatic recording devices, if the ship is equipped with these devices, for the period of the suspected unauthorized discharge to determine if the ship met the requirements for the concentration and the total amount of oil discharged.

(5) Compare the continuous records, as appropriate, to the ORB entries to see if they correspond.

(6) Check for the voyage whether sufficient time elapsed for the ship to have deballasted through the cargo monitor considering the monitor's capacity and the time period logged in the ORB.

(7) Check for missing ORB entries that should have been made during a particular voyage or in connection with other associated transfer operations.

(8) Check the operation of pollution prevention equipment i.e., oily-water separators, monitors, and alarms, if there is reason to suspect their malfunction.

(9) Check the sequence of oil transfers in the ORB for discrepancies.

(10) If pages of the ORB are required for evidence, make copies of the ORB pages and have the

(11) Tour the ship's spaces looking for signs of oil discharge.

(12) Interview ship personnel concerning the ship's operations on the date(s) in question.

5. Damage Stability Information Review

Proper loading of a ship is essential for safety and to prevent the possible occurrence of a major oil spill disaster. Regulation 25 of MARPOL 73/78 contains the requirements for damage stability. The review of damage stability requirements will be conducted during the annual foreign tanker examination and during other boardings, such as for monitoring transfer operations as described in Commandant Instruction 5010.8. The purpose of these boardings is to verify that the ship has the proper stability information on board and is loaded in accordance with the approved stability information.

Regulation 25 requires information that would enable the damage stability of a tanker to be assessed under conditions the same as or similar to those under which the tanker is expected to operate. For this purpose it was agreed at IMO that only the full load condition and a limited number of partial load conditions should be evaluated and made available to the master. Additional partial loading conditions should be evaluated depending upon the ship's operational needs. The United States does not accept this interpretation because the partial load conditions provided may be less severe than the ship's actual operating conditions while in U.S. waters. As a result, the United States requires new ships that are oil tankers to have stability information on board for the loading conditions under which they are operating while in U.S. waters.

FIGURE E1-5 To Be Added Later in Electronic Version

FIGURE E1-6 To Be Added Later in Electronic Version

a. Damage Stability Requirements. All new ships that are oil tankers must have damage stability information on board to permit the master to load the ship in a manner to resist damage and minimize oil pollution in case of grounding or collision (Annex I, Regulation 25 of MARPOL 73/78). At the time of their construction, U.S. flag ships are provided with Coast Guard approved stability information to comply with E1 CFR 157. These requirements meet or exceed those in MARPOL 73/78. However, the need for damage stability information in the form required by MARPOL 73/78 will be a new requirement for many foreign ships. Damage stability information for U.S. ships is normally found in either the ship's "Trim and Stability Booklet" or the ship's "Loading Booklet," sometimes referred to as the Loading Manual. Foreign ships will have stability information in similar documents.

(1) Trim and Stability Booklet. From the information in this booklet, the master or chief mate prepares a calculation for each loading condition of the ship. The booklet provides the master with sufficient information to calculate the stability of the ship for any full or partial loading condition. The Trim and Stability Booklet typically contains the following information:

(a) General description and light-ship data;

(b) Instructions for calculating draft, trim and the center of gravity (KG);

(c) Tank capacity tables;

(d) Table of hydrostatic properties for the range of operating drafts, which are used to develop the loading conditions;

(e) Curve or table of allowable center of gravity (KG) or required metacentric height (GM) versus draft; and

(f) Blank calculation forms.

(2) Loading Booklet (Loading Manual). The Loading Booklet provides the master with a limited number of pre-calculated full and partial loading conditions for departure and arrival. Each condition will be a separate page in the booklet and will show either the amount of cargo or the percentage (0%, 50%, 75%, 98%) of cargo in each tank for that loading condition.

b. Damage Stability Boarding Procedures. Determining whether a ship has proper damage stability information and whether it is properly loaded is difficult since stability information is highly technical, is provided in several acceptable forms, and is usually in the language of the ship's flag state. Boarding officers must use all of their skills in communication and observation, as well as common sense and judgement, in determining whether a ship's damage stability information is adequate and whether the ship is correctly loaded. To determine whether a ship complies with the MARPOL 73/78 damage stability requirements, the following procedures are provided:

(1) Record the forward, midships (if available), and after drafts you observe when boarding the ship. If a midship draft is not available, calculate the mean draft by averaging the forward and after drafts. The trim is the difference between the forward and after drafts.

(2) Ask the master to describe the loading of his cargo tanks upon port entry prior to commencing transfer operations in terms of percent of the tank full (e.g., fully loaded, #1 tanks full, #2 tanks at 60%, etc.). Record the fill percentages of each of the cargo tanks. It is particularly important to note which cargo tanks are partially full, especially cargo wing tanks, since they affect stability to a greater extent than other loaded tanks.

(3) Ask the master or the cargo loading officer for the ship's Trim and Stability Booklet or the Loading Booklet (Loading Manual). If the ship has no stability information, this is a major design deficiency, and the enforcement actions in volume I, chapter 4 of the Marine Safety Manual for a major design deficiency are to be followed.

(a) If presented with the Trim and Stability Booklet, ask the ship's officer to show you the loading condition calculations. Record the forward, after, and mean drafts calculated and the percentage fill of each cargo tank for that loading condition.

(b) If presented with the Stability Booklet (Loading Manual), ask the ship's officer to show you the specific page that was followed for the ship's loading condition. Record from this page the forward, after, and mean drafts and the percentage fill of each cargo tank.

(4) Compare the cargo tank levels given by the master and the observed drafts to the cargo tank levels and drafts obtained from the ship's Trim and Stability Booklet or the Loading Booklet. Record any cargo tank levels that do not agree within 5%, record if the mean draft observed does not agree with the calculated mean draft to within four (04) inches, and record if the trim observed does not agree with the calculated trim to within twelve (12) inches.

(5) Ask the ship's officer to explain any differences greater than indicated in step (4). Boarding officers must understand that considerable differences between observed drafts and the ship's calculated drafts may occur when the ship is in the process of loading or unloading cargo as compared to the fully loaded or completely ballasted conditions. Other causes of differences between the drafts observed or given by a ship's officer and those calculated may be due to hog or sag conditions; fuel consumed; inaccuracies in reading the draft marks due to weather or the ship's position at the dock; water density; and the different reference points from which draft marks may be measured.

(6) If the explanation for differences noted in step (4) is unsatisfactory, ask the ship's officer to verify the present level in several of the cargo tanks and compare them to the cargo tank levels listed in the stability booklets for the loading condition. Partially loaded cargo tanks should be checked first. The tank levels may be obtained from soundings, reading ullages, or reading tank level indicators. There may be large variations in tank levels due to transfer operations. Unexplained variations of 5% or more between the present tank loading level and the tank level used for calculations or listed in the Trim and Stability Booklet or the Loading Booklet are an indication the ship has a major operational deficiency. The boarding officer then should contact the Commanding Officer of the MSO or OCMI for direction as to the enforcement actions to take as indicated in volume I, chapter 4 of the Marine Safety Manual for a major operational deficiency.

6. U.S. Requirements Exceeding Those of MARPOL 73/78

Where U.S. requirements exceed those of MARPOL 73/78, specific examination of these features shall be conducted by the boarding officers. The U.S. requirements exceeding those of MARPOL 73/78 include:

a. Those for containment in 33 CFR 155.310;

b. Those for the reduced optional period for the use of CBT in lieu of SBT or COW on certain crude oil tankers in 33 CFR 157.10a; and

c. Those for SBT, CBT, and COW on existing tankers of 20,000 to 40,000 DWT that are 15 years old or more in 33 CFR 157. These requirements went into effect on 1 January 1986 under Section 5(7)(E) and (H) of the Port and Tanker Safety Act of 1978 (46 U.S.C. 3705 and 3706).

E. MARPOL 73/78 ANNEX II BOARDING GUIDANCE AND PROCEDURES

MSO's and COTP's, as part of the Standard Vessel Boarding Program, shall incorporate review of Annex II requirements when monitoring cargo operations aboard ships carrying Noxious Liquid Substances (NLS's) in bulk. Emphasis should be placed on cargo transfer and waste discharge related records and operational requirements as recorded in the Cargo Record Book (CRB) and described in the ship's Procedures and Arrangements Manual (P&A Manual). Certificates shall also be reviewed for validity.

During boardings of "high priority" vessels carrying NLS's, Boarding Officers shall ensure the ship has an approved P&A Manual, properly maintains a Cargo Record Book, carries NLS in approved tanks, has properly stripped cargo tanks and cleared transfer lines, has correctly discharged NLS waste to the sea, has correctly pre-washed tanks and discharged the NLS waste to an adequate reception facility, and has the required certificates. Boarding officers may use the Annex II Boarding Checklist provided in Figure E1-7 to aid them in an Annex II compliance check. Enforcement guidance for Annex II violations is provided in chapter 4- of volume I of the Marine Safety Manual.

1. Applicability

a. Annex II of MARPOL 73/78 applies to oceangoing ships (see definition of oceangoing) carrying noxious liquid substances (NLS) in bulk. The regulations implementing Annex II requirements pertaining to the various types of ships are as follows:

(1) Tankships and tank barges carrying oil-like NLS under 33 CFR 151;

(2) Offshore supply vessels under 46 CFR 98;

(3) Chemical tank barges carrying certain Category D NLS under 46 CFR 151; and

(4) Chemical tankships and tank barges under 46 CFR 153.

b. The regulations do not apply to:

(1) A tank barge on a limited short protected coastwise voyage whose COI is endorsed for such a route; and

(2) Fixed or floating drilling rigs or other offshore platforms, unless they carry NLS as bulk cargo. (If these ships were designed for carrying NLS cargo in bulk they would be treated as chemical tankers.)

c. Where an oil cargo and NLS cargo are carried on the same ship, the provisions and appropriate requirements of MARPOL 73/78 Annex I and Annex II apply.

2. Vessel Document Requirements

There are several certificates and manuals which a ship must have and maintain to carry NLS in bulk. The documents required depend upon the vessel's service, the NLS and other cargoes it carries, where it operates, whether the ship's flag state is a Party to MARPOL 73/78, and whether the ship must meet the International Bulk Chemical Code or the Bulk Chemical Code. (See also NVIC 5-87).

A ship carrying NLS in bulk must have its certificates readily available for inspection. Photo copies are not acceptable. A certificate will show its expiration date and will be signed by an authorized issuing authority. A certificate which has been altered is not acceptable. If operating under an alternative or waiver, the document or endorsement indicating such must be on or attached to the certificate. For adding new cargoes a fax from Commandant (MSE) attached to the certificate is acceptable.

For several years two separate certificates have been issued by the Coast Guard to foreign tank vessels. The Letter of Compliance (LOC) is issued to a foreign tank vessel for the carriage of hazardous chemicals and must be accompanied by a Subchapter O Endorsement (Cargoes and Restrictions List) for tank vessels transporting natural gas cargo. The Subchapter O Endorsement (SOE) is an MSIS product which is prepared by the CG Marine Safety Center after acceptance of a vessel's IMO Certificate of Fitness or after special review of the vessel, if no IMO certificate is available.

The Tank Vessel Examination Letter (TVEL) is issued to foreign tank vessels which carry only flammable and/or combustible cargoes. Rather than issue a separate TVEL to a vessel with an LOC, standard practice is to include an endorsement for flammable and/or combustible liquids on the face of the LOC.

A new Certificate of Compliance (COC) form is being prepared as an MSIS product to replace both the LOC and the TVEL. Until the COC is implemented, the LOC and TVEL will continue to be issued and be found on board foreign tank vessels. Rather than refer to both the LOC and TVEL in this instruction the term COC is used throughout. U.S. ships, Party ships and non-Party ships calling on U.S. ports will be examined by marine inspection personnel. If the ship is found in compliance with Annex II, it will be issued or must maintain one or more of the following documents as indicated in Figure E1-8. The applicable documents must be available for inspection by boarding officers. The following paragraphs further describe these documents and the requirements. For a Party ship the Coast Guard endorsement of its COC is invalid if the ship's IMO Certificate expires or becomes invalid.

FIGURE E1-7: MARPOL ANNEX II BOARDING CHECKLIST

NOTE: Intended as review only. For further guidance, refer to MSM II.E.1.

1. Review Vessel Documentation.
   - Does vessel have required documents? (Refer to Figure E1-8 of MSM II)
   - Does vessel name and registry match all documents?
   - Verify that the NLS cargoes on board are authorized by the certificate and are listed on the cargo manifest.

2. Review P&A Manual. (if required)
   - Is P&A Manual approved by vessel's flag state Administration or the Coast Guard for U.S. and non-Party vessels?
   - Is the P&A Manual in the format prescribed by the Standards for Procedures and Arrangements (USCG CITS-86-1-1)?

3. Review Cargo Record Book. (if required)
   - Is vessel using the correct version of the Cargo Record Book?
   - Has each entry been signed by the officer in charge and each completed page signed by the master?
   - Was the last cargo unloading operation in compliance with Annex II and U.S. regulations?
   - For potentially solidifying or high viscosity NLS, was a pre-wash required and carried out properly? If a pre-wash waiver was issued, was the Cargo Record Book signed by a surveyor or government official?
   - For the last voyage, did the vessel discharge any NLS residue? If so, did the vessel meet all discharge restrictions? (Refer to Figures E1-10 and E1-11 of MSM II.)

4. Review Monitoring Equipment. (if required)
   - Compare recorded discharges to the entries in the Cargo Record Book.
   - Is the record signed by the officer in charge?
   - If monitor is inoperative, does Cargo Record Book indicate the problem and any corrective action?

5. If Possible, Monitor NLS Cargo Loading, Unloading, Stripping and Line Clearing Operations.
   - Determine name and category of the NLS cargo.
   - Determine if the cargo tank is approved for carriage of the NLS.
   - Review the Cargo Record Book to determine if there are any problems with any of the equipment. (i.e., stripping, temperature sensing systems, cargo pumps, etc.)
   - For potentially solidifying or high viscosity Category B or C NLS's, determine the temperature at which the cargo must be transferred so as not to require an in-port prewash.
   - Ensure that stripping operations are carried out according to the requirements in the vessel's P&A Manual.
   - If an in-port pre-wash is required, follow the procedures in the MSM II E1.E.7.
   - Verify that cargo transfer hoses are not drained back to the ship after unloading an NLS cargo.

ANY DISCREPANCIES NOTED SHOULD INITIATE A MORE THOROUGH REVIEW AS DESCRIBED IN VOLUME II, SECTION E, CHAPTER 1.E.6.b, OF THE MARINE SAFETY MANUAL.

Certificate of Inspection (COI)(CG-841)

a. Certificate of Inspection (COI)(CG-841). This certificate is issued under Subchapters D and O or I and O to U.S. ships and carries endorsements for the carriage of specific NLS cargoes for each cargo tank. The OCMI issues a COI after the ship has had a satisfactory inspection. The Coast Guard is responsible for issuing this certificate in accordance with 46 CFR 30-40 and 153. The specific endorsements and conditions for Annex II requirements found on the COI come from 33 CFR 151 & 157 and 46 CFR 98, 151, 153 & 172 and have the same force and effect as the regulations requiring them. Each COI is endorsed, according to individual tanks to show which NLS's can be carried and where they may be carried on the ship.

Certificate of Compliance (COC)(CG-3308A)

b. Certificate of Compliance (COC)(CG-3308A). This certificate is issued to foreign ships and carries endorsements for the carriage of specific NLS cargoes for each cargo tank. The OCMI issues a COC, if a ship has a valid International Certificate of Fitness (ICF) or Certificate of Fitness (COF) issued by a Party signatory to Annex II of MARPOL 73/78. The ICF or COF must first be accepted by the Marine Safety Center who prepares the SOE. Non-Party ships may not have an ICF or COF but must be inspected for a COC under U.S. regulations. In most cases Commanding Officer, MSC reviews a vessel's "non-Party" ICF or COF and the vessel's P&A manual to verify compliance with the applicable requirements.

NOTE: If the vessel is a gas carrier found to be in compliance, Commanding Officer, MSC will prepare an SOE which can be issued by the OCMI as described above.

International Certificate of Fitness for the Carriage of Dangerous Chemicals In Bulk (ICF)

c. International Certificate of Fitness for the Carriage of Dangerous Chemicals In Bulk (ICF). This certificate is issued by Party nations under the International Bulk Chemical Code (IBC), as adopted under Resolution MEPC 19(22), to their oceangoing ships which were built after 30 June 1986. Ships built prior to 1 July 1986, may elect to hold the ICF in lieu of the COF. The ICF is required on oceangoing chemical tankers on foreign voyages and on oceangoing tank barges when in the waters of a Party nation. A U.S. or foreign Party ship on an international voyage will have either an ICF or COF according to when the vessel was built. U.S. ships on domestic oceangoing voyages do not require an ICF.

Certificate of Fitness for the Carriage of Dangerous Chemicals In Bulk (COF)(CG-5148A)

d. Certificate of Fitness for the Carriage of Dangerous Chemicals In Bulk (COF)(CG-5148A). This certificate is issued by Party nations under the Bulk Chemical Code (BCH), as adopted under Resolution MEPC 20(22), to their oceangoing ships which were built before 1 July 1986. The COF is required for oceangoing chemical ships on foreign voyages and oceangoing tank barges when in the waters of a Party nation. A U.S. or foreign Party ship on an international voyage will have either an ICF or COF according to when the vessel was built. U.S. ships on domestic oceangoing voyages do not require a COF.

International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk (NLS Certificate)

e. International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk (NLS Certificate). This certificate is issued to oceangoing ships carrying only certain Category D NLS in bulk which are listed in 33 CFR 151 and 46 CFR 151. Ships carrying oil-like Category D NLS cargoes in bulk may as an alternative be issued an International Oil Pollution Prevention Certificate by Party nations. Party oil tankers, offshore supply vessels and non-self-propelled vessels carrying Category D NLS cargoes in bulk, which do not have a COC and ICF or COF, are required to have an NLS Certificate when calling on U.S. ports. Non-Party ships which do not have an endorsed COC must have a letter issued by Commanding Officer, MSC indicating compliance with the relevant Annex II requirements.

International Oil Pollution Prevention Certificate with Form B Supplement Attachment (IOPP/ATTCH) (CG-5352)

f. International Oil Pollution Prevention Certificate with Form B Supplement Attachment (IOPP/ATTCH)(CG-5352). This attachment is issued to ships which want to carry oil-like Category C or D NLS as oil under the requirements of Annex I of MARPOL 73/78. U.S., Party and non-Party oil tankers which decide to carry oil-like Category C or D NLS as oils under Annex I of MARPOL 73/78 are required to have an IOPP Form B supplement endorsed for the NLS cargoes.

Procedures and Arrangements Manual (P&A Manual)

g. Procedures and Arrangements Manual (P&A Manual). This document is approved by the Administration of the flag state and describes in detail the procedures for NLS cargo carriage, tank-to-tank transfers, cargo loading, unloading, stripping operations, and tank pre-washing and ventilation procedures. U.S. and foreign ships shall have an approved P&A Manual available on board the ship for inspection by the boarding officer. The Coast Guard approves P&A Manuals for U.S. and non-Party ships. Party Administrations approve the P&A Manuals for their ships. The approval will be evident by a stamp and signature of the approving official of an authorized agency of the flag state's Administration on the cover of the P&A Manual.

NOTE: The P&A Manual is waived for ships carrying NLS cargo in dedicated tanks, OSV's which cannot discharge NLS to the sea and ships carrying oil-like Category C or D NLS as an oil under Annex I. For some U.S. vessels which discharge all residues to shore reception facilities the P&A Manual is not required and a statement on the COI would indicate this exception.

Cargo Record Book (CRB) (CG-4602)

h. Cargo Record Book (CRB)(CG-4602).

(1) Requirements. This document is required on board every ship carrying NLS in bulk. The form of the CRB is specified in Appendix IV of Annex II of MARPOL 73/78. The CRB is used to record internal and external transfers and discharges of NLS cargo or waste, information concerning inoperative cargo transfer, tank cleaning and pollution prevention equipment, actions by surveyors, and any other cargo or waste related activities. Specific requirements for U.S., Party and non-Party ships are as follows:

(a) U.S. Ships. U.S. ships are required to obtain and maintain the U.S. version of the Cargo Record Book from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402. (Sales stock number 050-012-00233-9)

(b) Party Ships. Party ships are required to use their country's version of the CRB, or have a CRB in the form specified in Appendix IV of Annex II of MARPOL 73/78.

(c) Non-Party Ships. Non-Party ships are required to have on board and maintain a CRB. These ships may use the U.S. version or another version which is in the form specified in Appendix IV of Annex II of MARPOL 73/78.

(2) Format. The CRB follows an internationally accepted format which records transfer operations in chronological order by coded and numbered entries. An improperly kept CRB may be used as evidence against a ship suspected of an illegal NLS discharge, while a correctly maintained record could establish a successful defense to an alleged violation.

(3) Maintenance. The ship's master is responsible for properly maintaining the CRB and for ensuring its availability on board the ship for review. The officer(s) in charge shall sign the log for each completed operation and the ship's master shall countersign each completed page. Ships are to keep the CRB on board for a period of three years after the date of the last entry.

MARPOL 73/78 Annex II Vessel Document Requirements (Figure E1-8).

i. MARPOL 73/78 Annex II Vessel Document Requirements (Figure E1-8). This figure contains a list of the various combinations of certificates and documents required by Annex II and U.S. law for U.S. ships in U.S. waters. If there is an "or" after the certificate code it means the ship may hold one or the other of the certificates, but not both.

3. Document Review Procedures

a. Certificates. Boarding Officers are to determine if the certificate is valid by:

(1) Comparing the name and the registry of the ship on the front of the certificate to the ship's name and flag;

(2) Checking the certification date, expiration date and signature of the issuing authority on the certificate or endorsement to determine if the certificate is valid. If the certificate appears to be invalid, the boarding officer should contact the OCMI, for further instructions. Additionally, for the ICF and COF check the following:

(a) The ICF is issued under Resolution MEPC 19(22);

(b) The COF is issued under Resolution MEPC 20(22); or

(c) The ICF or COF is the same certificate as is identified on the Subchapter O Endorsement to the vessel's COC for MARPOL non-signatory chemical tankships.

FIGURE E1-8 To Be Added Later in Electronic Version

(3) Checking the certificate for the timely completion of required surveys and the proper recording of the entries, if appropriate; and

(4) Verifying that the NLS cargoes on board are authorized for carriage by the certificate and endorsement in the tanks where stowed and are listed on the cargo manifest for the current voyage.

b. P&A Manual Boarding Procedures. The P&A Manual is an extremely important document since it gives the detailed procedures for the ship to perform all transfer and tank cleaning operations. Boarding officers are to:

(1) Check that the P&A Manual is on board and is approved by the ship's flag state Administration or the Coast Guard for U.S. and non-Party ships; and

(2) Check that the P&A Manual is in the format prescribed by the Standards for Procedures and Arrangements (see USCG CITS-86-1-1, Commandant's International Technical Series) and has procedures for the operations the ship has most recently performed, i.e., ventilating, pre-washing, etc. More specific review procedures are provided in other sections pertaining to cargo transfers and the pre-washing of cargo tanks.

Cargo Record Book

c. Cargo Record Book. The ship's CRB shall be reviewed each time a ship is boarded to ensure the ship's personnel are properly recording NLS transfers and discharges, that the discharges to the sea of waste are correctly performed, that equipment failures are logged and that mandatory pre-wash activities are conducted and the pre-wash slops discharged to an adequate reception facility. Because of the chronological and numerical entries, boarding personnel should be able to determine if the CRB has been properly maintained and the necessary entries have been made. Boarding Officers are to:

(1) Check whether the ship is using the correct version of the CRB.

(2) Check entries in the CRB for the signature of the officer(s) in charge for each entry and that the master has signed each completed page.

(3) Check the last cargo unloading operation for compliance with Annex II and U.S. regulations.

(a) Determine the name and category of the NLS unloaded.

(b) Determine whether the NLS unloaded is potentially solidifying and/or high viscosity (see Section E1.E.7, Annex II Pre-wash And Pre-wash Surveyor Guidance and Procedures).

(c) For non-solidifying or non-high viscosity NLS, determine if stripping was accomplished in accordance with the P&A Manual.

(4) For potentially solidifying or high viscosity NLS, determine:

(a) The temperature of the cargo during unloading;

(b) Whether a pre-wash was required;

(c) If the pre-wash was properly conducted;

(d) If the pre-wash slops were discharged to an adequate reception facility;

(e) If a surveyor was present to witness the prewash;

(f) If a waiver was issued to backload a compatible cargo, and, if so, that the correct cargo was backloaded;

(g) If a waiver was issued to allow pre-washing in another port, and, if so, that the ship did not ballast or wash tanks while en route, that the pre-wash was conducted in the other port, and that the slops were discharged to an adequate reception facility; and

(h) For waivers, that a surveyor or government official signed the CRB to allow the waiver.

(5) For the last voyage, check if the ship discharged at sea.

(a) Check if the NLS residue discharged is allowed to be discharged.

(b) Check if the ship met the restrictions for the discharge of the category of NLS waste as outlined in figures E1-10 and E1-11 of this section.

(c) Check output from discharge recorder for ships operating under the interim standards and discharging Category B NLS waste. If a ship carries oil-like Category C or D NLS under its IOPP Certificate, the Oil Record Book must have an entry showing that the ship's monitors have been adjusted to measure the oil-like Category C or D NLS.

4. Recording Equipment

Requirements

a. Requirements. Ships built before July 1, 1986, carrying Category B NLS and operating under the interim standards, are required to have recording equipment that is capable of automatically recording the time and date of the beginning and end of a discharge and the flow rate, where appropriate, of the discharge as prescribed in 46 CFR 153.481. Procedures to follow in the event of failure of this equipment are found in 46 CFR 153.1130.

Inspection Procedures

b. Inspection Procedures. To ensure the proper operation of the required recording equipment, the boarding officer should check:

(1) The times discharges were recorded compared to the Cargo Record Book;

(2) The flow rate of the discharge, when required to be recorded;

(3) That the entries are correctly made;

(4) That the record is signed by the person in charge; and

(5) That failures of recording device are logged in Cargo Record Book.

5. NLS Cargo Monitoring Procedures

Depending upon the operations in progress when the Coast Guard boarding officer arrives, the boarding officer should monitor part or all of the cargo loading, unloading, stripping and line clearing operations using the information contained in the ship's P&A Manual. The boarding officer should also observe pre-wash operations if these are being conducted, and observe third-party pre-wash surveyors if they are verifying the pre-wash operations. The requirements for surveyor duties during prewashes are provided in section E1.E.7. Figure E1-9 outlines the stripping requirements for certain types of vessels handling certain types of cargoes. Additional information on the testing of stripping systems is provided in NVIC 5-87. For ships carrying oil-like Category C or D NLS as oils there is a requirement under 33 CFR 151.37 and 151.41 for a cargo discharge monitor that is designed to measure and record the NLS content of the oil-like cargo residues. The review procedures and enforcement guidance for this monitor are found in volume I, chapter 4 of the Marine Safety Manual.

NLS Cargo Loading Monitor Procedures

a. NLS Cargo Loading Monitor Procedures. The following items should be reviewed when loading NLS cargo:

(1) Determine the name and category of the NLS being loaded by reviewing the bill of lading or shipping papers.

(2) Determine the tank the NLS will be loaded into from the ship's person in charge of the loading.

(3) Determine if the NLS can be carried in the tank by examining the P&A Manual and the appropriate certificates.

(4) Verify other specific loading requirements are correctly performed as outlined in the P&A Manual.

Unloading Monitoring Procedures

b. Unloading Monitoring Procedures. NLS unloading procedures must be correctly performed; otherwise, NLS residues in excess of the amounts permitted may be discharged at sea and cause harm to the marine environment. Boarding officers should give special attention to stripping and line clearing operations in accordance with the procedures and requirements specified in sections 2 and 3 of the P&A Manual as well as ensuring prewashes are conducted for Category A and solidifying or high viscosity Category B and C NLS's. The P&A Manual should indicate the method and sequence for operation of the cargo and/or stripping pumps and associated equipment. The below items, as appropriate, should be reviewed during NLS unloading operations. If complete information is not contained in the P&A Manual, copy the procedures that are given in the P&A Manual and forward them to Commandant (G-MOC) together with the identity of the ship, and any other problems encountered. The information in section E1.E.5.b.(8) will normally be obtained during the ship's initial "efficient stripping test." Failure to conduct subsequent stripping and line clearing operations in accordance with the procedures specified in the ship's P&A Manual is likely to leave a greater amount of cargo in the tank than is otherwise indicated in the ship's P&A Manual. It may also result in exceeding the quantities permitted by the regulations. In such circumstances the ship may be required to conduct mandatory pre-wash operations and make arrangements to discharge the resulting pre-wash residue to an adequate reception facility, unless it can be established that the appropriate tank(s) and piping contain less NLS residue than by following the P&A Manual procedures. See section E1.E.7.c.(1)(c).

(1) Determine the name and category of the NLS being unloaded by reviewing and comparing the cargo manifest, bill of lading, and Cargo Record Book.

(2) Determine the tank to be unloaded by referring to the cargo manifest and bill of lading.

(3) Determine if the cargo tank is approved for carriage of the NLS by reviewing the P&A Manual and appropriate certificates.

(4) Review the Cargo Record Book to determine if there are any problems with unloading equipment, i.e., stripping, temperature sensing systems, cargo pumps, etc.

(5) For potentially solidifying or high viscosity Category B or C NLS's, determine from the bill of lading or shipping papers the temperature at which the NLS cargo must be transferred so as not to require an in port pre-wash.

(6) Determine from the P&A Manual how and where to read the cargo unloading temperature.

(7) For potentially solidifying and high viscosity Category B or C NLS, verify the cargo unloading temperature and determine whether based upon the unloading temperature a pre-wash will be required.

FIGURE E1-9 To Be Added later in Electronic Version

(8) Review stripping operations by verifying that the following requirements as specified in the ship's P&A Manual are met:

(a) List and trim.

(b) Time required for stripping.

(c) Minimum pump speed (or hydraulic supply pressure for hydraulically driven pumps).

(d) Minimum purge gas pressure and time required for purging (for hydraulically driven pumps utilizing column purging or purge pipe arrangements).

(e) Minimum eductor supply pressure and time required for stripping (for ship utilizing stripping eductors).

(f) Minimum gas pressure and time needed to clear lines.

(9) If an in-port pre-wash is required, follow the procedures in section E1.E.7 for verifying that the pre-wash is properly conducted and the slops are transferred to an adequate reception facility.

(10) Verify cargo transfer hoses are not drained back to the ship.

6. Cargo Discharge Enforcement

Investigation of alleged NLS discharge violations may result from reviewing the ship's CRB; from reports of discharge violations from individuals, companies, or other nations; or from aerial surveillance, if the NLS produces a sheen or discoloration of the water. Discharge investigations require a thorough review of the ship's documents, logs and certificates, with special attention given to the ship's CRB and P&A Manual; inspection of the ship's spaces, and interviewing ship's personnel to determine if the ship's discharges are to be reported without delay as required by 46 CFR 153.1132.

a. Discharge Requirements. The discharge requirements for oceangoing ships carrying NLS in bulk are found in Regulation 5 of Annex II and in 46 CFR 153.1102, 1122, 1124, 1126, and 1128. Additionally, ships must comply with the stripping, prewashing, surveyor requirements and associated waivers and exemptions, since a violation or non-compliance with these requirements may result in NLS residues in excess of authorized amounts being discharged. Figures E1-10 and E1-11 summarize the discharge requirements for NLS by category outside and inside Special Areas. All authorized discharges of Category A, B, C, and D NLS and ballast water, tank washings, and other residues or mixtures containing NLS must occur beyond the contiguous zone, i.e., greater than 12 nautical miles offshore and must be made through a suitably sized and approved discharge opening located on the bottom of the ship's hull near the keel.

Oil-like Category C and D NLS when carried as oils under 33CFR 151 have the same discharge requirements as oils, which are contained in section E1.D of this chapter.

(1) Category A NLS OUTSIDE Of Special Areas. Discharges of Category A NLS and ballast water, tank washings and other residues or mixtures containing Category A NLS are prohibited (Reg 5(1) of Annex II and 46 CFR 1128). The only exception to this rule is after an in-port pre-wash is satisfactorily completed on a tank which held Category A cargo, water added to the tank may be discharged to the sea under the conditions in figure E1-10.

(2) Category B NLS Outside of Special Areas.

(a) Category B Discharges. Discharges of Category B NLS and ballast water, tank washings and other residues or mixtures containing Category B NLS are prohibited, except when discharged in compliance with the restrictions in figure E1-10.

(3) Category C NLS Outside of Special Areas. Discharges of Category C NLS and ballast water, tank washings and other residues or mixtures containing Category C NLS are prohibited, except when discharged in compliance with the restrictions in figure E1-10.

(4) Category D NLS Ooutside of Special Areas. Discharges of Category D NLS and ballast water, tank washings and other residues or mixtures containing Category D NLS are prohibited except when diluted with water 10 to 1 and discharged in compliance with the restrictions in figure E1-10 or discharged through an underwater discharge outlet. Water added subsequent to dilution and discharged to the sea may be discharged without restriction.

(5) Category A NLS Inside of Special Areas. The discharge requirements are the same as in section E1.E.6.a.(1), except that the discharge restrictions in figure E1-11 apply.

(6) Category B NLS Inside of Special Areas. Discharges of Category B NLS and ballast water, tank washings and other residues or mixtures containing Category B NLS are prohibited. The only exception is after a pre-wash has been satisfactorily completed and these washings transferred ashore, the water added to the tank may be discharged to the sea under the conditions listed in figure E1-11.

(7) Category C NLS Inside of Special Areas. The discharge requirements are the same as in section E1.E.6.a.(3), except that the discharge restrictions in figure E1-11 apply.

(8) Category D NLS Inside of Special Areas. The discharge requirements are the same as in section E1.E.6.a.(4), except that the discharge restrictions in figure E1-11 apply.

(9) Uncategorized Substances. Substances which have not been categorized or assigned a provisional category are prohibited from being carried in bulk and the discharge of these substances and ballast water, tank washings and other residues or mixtures containing these substances are prohibited.

(10) Non-Harmful Substances. Substances and ballast water, tank washings and other residues or mixtures containing substances evaluated as non-harmful, may be discharged without restriction. Non-harmful substances are indicated in 46 CFR 153, Table 1 by a III in column one entitled "IMO Annex II pollution category."

(11) Fixed and Floating Drilling Rigs and Other Platforms. If the rig or platform carries NLS cargo in bulk, it must comply with the discharge requirements in 46 CFR 153. For rigs and platforms that do not carry NLS in bulk as cargo, the discharge of NLS is prohibited, except when the fixed or floating drilling rig or other platform is operating under a valid NPDES permit in accordance with section 402 of the Clean Water Act, as amended and in accordance with 40 CFR Chapter I.

FIGURE E1-10: NLS DISCHARGE RESTRICTIONS OUTSIDE OF SPECIAL AREA DISCHARGE CRITERIA

Cat A is prohibited except—

(1) Ship proceeding en route subsequent after a tank
(2) Self-propelled ship's speed 7 kts or pre-washing satisfactorily greater; non-self-propelled ship's completed IAW 46 CFR 153 or speed 4 kts or greater Reg I of Annex II of MARPOL
(3) Discharge is below the waterline 73/78 is conducted
(4) Discharge is greater than 12 nm from nearest land
(5) Depth of water is 25 meters or more

Category B*—

(1) Ship Proceeding en route
(2) Self-propelled ship's speed 7 kts or greater; non-self-propelled ship's speed 4 kts or greater
(3) Discharge is below the waterline
(4) Discharge procedures are approved in P&A Manual
(5) Discharge is greater than 12 nm from nearest land
(6) Depth of water is 25 meters or more
(7) Quantity of NLS discharged per tank is less than 1 m3 or 1/3000 of the tank's capacity

Category C*—

(1) Ship proceeding en route
(2) Self-propelled ship's speed 7 kts or greater; non-self-propelled ship's speed 4 kts or greater
(3) Discharge is below the waterline
(4) Discharge procedures are approved in P&A Manual
(5) Discharge is greater than 12 nm from nearest land
(6) Depth of water is 25 meters or more
(7) Quantity of NLS discharged per tank is less than 3 m3 or 1/1000 of the tank's capacity

Category D—

(1) Ship proceeding en route
(2) Self-propelled ship's speed 7 kts or greater; non-self-propelled ship's speed 4 kts or greater
(3) Discharge is greater than 12 nm from nearest land
(4) Discharge concentration from the tank is less than 1 part in 10 or discharged below the waterline

Provisionally Assessed NLS*—

(1) Discharge in accordance with restrictions for provisional category

Uncategorized Substances*—

(1) Prohibited

Non-harmful Substances—

(1) No restrictions on discharges

*****Includes ballast water, tank washings or other residues or mixtures containing such NLS

FIGURE E1-11: NLS DISCHARGE RESTRICTIONS INSIDE OF SPECIAL AREA

Category A prohibited

(1) Self-propelled ship's speed 7 kts or except subsequent water greater;
(2) non-self-propelled ship's added to tank after tank speed 4 kts or greater pre-washing satisfactorily
(3) Discharge is below the waterline completed IAW 46 CFR 153 or
(4) Discharge is greater than 12 nm from Reg 8 of Annex II of MARPOL nearest land 73/78
(5) Depth of water is 25 meters or more

Category B prohibited

(1) Ship proceeding en route except subsequent water
(2) Self-propelled ship's speed 7 kts or added to tank after tank greater; non-self-propelled ship's pre-washing satisfactorily speed 4 kts or greater completed IAW 46 CFR 153 or
(3) Discharge is below the waterline Reg 8 of Annex II of MARPOL
(4) Discharge procedures are approved in P&A Manual
(5) Discharge is greater than 12 nm from nearest land
(6) Depth of water is 25 meters or more
(7) Quantity of NLS discharged per tank is less than 1 m3 or 1/3000 of the tank's capacity

Category C*

(1) Ship proceeding en route
(2) Self-propelled ship's speed 7 kts or greater; non-self-propelled ship's speed 4 kts or greater
(3) Discharge is below the waterline
(4) Discharge procedures are approved in P&A Manual
(5) Discharge is greater than 12 nm from nearest land
(6) Depth of water is 25 meters or more
(7) Quantity of NLS discharged per tank is less than 3 m3 or 1/1000 of the tank's capacity

Category D

(1) Ship proceeding en route
(2) Self-propelled ship's speed 7 kts or greater; non-self-propelled ship's speed 4 kts or greater
(3) Discharge is greater than 12 nm from nearest land
(4) Discharge concentration from the tank is less than 1 part in 10 or discharged below the waterline

Provisionally Assessed NLS*

(1) Discharge in accordance with restrictions for provisional category

Uncategorized Substances

(1) Prohibited

Non-Harmful Substances

(1) No restrictions on discharges

*Includes ballast water, tank washings or other residues or mixtures containing such NLS

Alleged Discharge Investigation Procedures

b. Alleged Discharge Investigation Procedures. The following procedures should be followed when investigating an alleged discharge violation. Figure E1-12 may be of help in determining the type of information to gather when investigating a possible violation. Enforcement guidance for Annex II discharge violations is provided in Chapter 4 of Volume I of the Marine Safety Manual.

(1) Prior to boarding, obtain a vessel history from the MSIS or, if the investigation results from directly receiving a report of an alleged discharge violation or from an MSIS Vessels of Particular Interest notice, review the discharge sighting report or contact Commandant (G-MOR) to obtain additional information.

(2) Upon boarding the ship inform the master that his ship is suspected of discharging NLS in violation of Annex II of MARPOL 73/78 and/or the Act to Prevent Pollution from Ships.

(3) Review the ship's COI, COC, COF, NLS Certificate or IOPP Certificate, as appropriate, for validity and to determine if the ship's equipment and operations comply with Annex II and 46 CFR 153.

(4) Review the ship's P&A Manual to determine if it is approved, NLS's permitted to be carried, and what the specific procedures are for discharging NLS.

(5) Review the discharge entries in the Cargo Record Book and other ship's logs for the period of the suspected unauthorized discharge. Compare this information to the requirements in Figure E1-10 or E1-11 to determine if the ship meets the restrictions for location speed, depth of water, etc. at the time and in the location of the reported sighting. If no discharge is recorded for the time of the sighting, check the Cargo Record Book for the last discharge and if the ship was in the area of the reported sighting. Question the master, chief mate, and engineer separately as to what could have been sighted being discharged from the ship, e.g., oil, bilge waste, garbage, gray water, etc.

(6) For ships using the interim pumping and piping arrangements for tanks carrying Category B NLS, review the outputs of the recording devices to determine the time the discharge started and stopped and to determine, if applicable, if the flow rate requirements stated in the P&A Manual were met.

(7) Compare the continuous records (section E1.E.6.b.(6) above), if applicable, to the Cargo Record Book entries to see if they correspond.

(8) Compare the discharge information in the Cargo Record Book to the authorized procedure in the P&A Manual to determine if the discharge quantity was correct and if the P&A Manual procedures were followed correctly.

(9) Check for missing Cargo Record Book entries that should have been made during a particular voyage or in connection with associated transfer operations.

(10) Check the sequence of NLS transfers in the Cargo Record Book for discrepancies.

(11) If the pages of the Cargo Record Book or other documents are required for evidence, make copies and have the master certify the accuracy of the reproductions.

(12) Interview ship's personnel concerning the ship's operations on the date(s) in question.

7. Annex II Pre-wash And Pre-wash Surveyor Guidance and Procedures

a. General Requirements. The U.S., in accordance with Regulation 8 of Annex II of MARPOL 73/78 and 46 CFR 153.1108 and .1112, requires ships to conduct mandatory in-port prewashes after unloading Category A and solidifying or high viscosity Category B and C NLS's. Prewashes are also required for other special circumstances such as not following P&A Manual procedures for unloading. Additionally, a "pre-wash surveyor" is required by 46 CFR 153.1120 to witness that mandatory prewashes are correctly performed after unloading Category A NLS's. The primary responsibility of the pre-wash surveyor is to ensure that pre-wash operations are conducted in accordance with the pre-wash procedures specified in the ship's P&A Manual. To assist the Coast Guard surveyor in performing his duties, a check-off list was developed (see figure E1-13). The check-off list ensures that the surveyor performs all the actions dictated by regulation and by the guidance presented here. Upon completion a copy of the check-off list will be forwarded to Commandant (G-MOC). The check-off list shall be copied directly from this section for local use. As outlined below, cargo tanks containing Category A NLS, as well as those containing Category B or C NLS considered to be either "solidifying" and/or "high viscosity," require prewashing, unless waived by one of the conditions described in Section E1.E.7.e, Pre-wash Waivers. It is important to note that Category A prewashes are the only prewashes which require witnessing by a pre-wash surveyor. In addition to witnessing pre-wash operations which occur at the unloading port, pre-wash surveyors will be required to witness those Category A prewashes which might occur at either a tank cleaning facility or at a ship repair yard.

Unloading Operations Requiring a Pre-Wash and Discharge

b. Unloading Operations Requiring a Pre-Wash and Discharge of the Pre-Wash Residue to an Adequate Reception Facility Provided by the Terminal.

(1) Category A NLS. After unloading a cargo tank containing a Category A NLS, the tank must be pre-washed in accordance with the procedures specified in the ship's P&A Manual and in 46 CFR 153.1120. This pre-wash operation must be witnessed by a pre-wash surveyor. Furthermore, the pre-wash residue must be discharged to a reception facility listed on a Certificate of Adequacy for NLS's prior to the ship leaving the unloading port.

FIGURE E1-12: ITEMIZED LIST OF POSSIBLE EVIDENCE ON ALLEGED CONTRAVENTION OF MARPOL 73/78 ANNEX II DISCHARGE PROVISIONS

1. ACTION ON SIGHTING POLLUTION

1.1 Particulars of ship or ships suspected of contravention
- 1.1.1 Name of ship
- 1.1.2 Reasons for suspecting the ship
- 1.1.3 Date and time (UTC) of observation or identification
- 1.1.4 Position of ship
- 1.1.5 Flag and port of registry
- 1.1.6 Type (e.g., tanker, cargo ship, passenger ship, fishing vessel), size (estimated tonnage) and other descriptive data (e.g., superstructure color and funnel mark)
- 1.1.7 Draught condition (loaded or in ballast)
- 1.1.8 Approximate course and speed
- 1.1.9 Position of slick in relating to ship (e.g., astern, port, starboard)
- 1.1.10 Part of the ship from which discharge was seen emanating
- 1.1.11 Whether discharge ceased when ship was observed or contacted by radio

1.2 Particulars of slick
- 1.2.1 Date and time (UTC) of observation if different from 1.1.3
- 1.2.2 Position of slick in longitude and latitude if different from 1.1.4
- 1.2.3 Approximate distance in nautical miles from the nearest land
- 1.2.4 Depth of water according to sea chart
- 1.2.5 Approximate overall dimension of slick (length, width and percentage thereof covered)
- 1.2.6 Physical description of slick (direction and form, e.g., continuous, in patches or in windows)
- 1.2.7 Color of slick
- 1.2.8 Sky conditions (bright sunshine, overcast, etc.), lightfall and visibility (kms) at the time of observation
- 1.2.9 Sea state
- 1.2.10 Direction and speed of surface wind
- 1.2.11 Direction and speed of current

1.3 Identification of the observer(s)
- 1.3.1 Name of the observer
- 1.3.2 Organization with which observer is affiliated (if any)
- 1.3.3 Observer's status within the organization
- 1.3.4 Observation made from aircraft, ship, shore or otherwise
- 1.3.5 Name or identity of ship or aircraft from which the observation was made
- 1.3.6 Specific location of ship, aircraft, place on shore or otherwise from which observation was made
- 1.3.7 Activity engaged in by observer when observation was made, for example: patrol, voyage (flight en route from ... to ...), etc.

FIGURE E1-12—Continued

1.4 Method of observation and documentation
- 1.4.1 Visual
- 1.4.2 Conventional photographs
- 1.4.3 Remote sensing records and/or remote sensing photographs
- 1.4.4 Samples taken from slick
- 1.4.5 Any other form of observation (specify)

NOTE: A photograph of the discharge should preferably be in color. The best results may be obtained with the following three photographs:

(1) details of the slick taken almost vertically down from an altitude of less than 300 meters with the sun behind the photographer;

(2) an overall view of the ship and "slick" showing a substance emanating from particular ship; and

(3) details of the ship for the purposes of identification.

1.5 Other information if radio contact can be established
- 1.5.1 Master informed of pollution
- 1.5.2 Explanation from master
- 1.5.3 Ship's last port of call
- 1.5.4 Ship's next port of call
- 1.5.5 Name of ship's master and owner
- 1.5.6 Ship's call sign

2. INVESTIGATION ON BOARD

2.1 Inspection of the Certificate (COF or NLS Certificate)
- 2.1.1 Name of ship
- 2.1.2 Distinctive number or letters
- 2.1.3 Port of registry
- 2.1.4 Type of ship
- 2.1.5 Date and place of issue
- 2.1.6 Date and place of endorsement

2.2 Inspection of P&A Manual
- 2.2.1 List of Annex II substances the ship is permitted to carry
- 2.2.2 Limitations as to tanks in which these substances may be carried
- 2.2.3 Ship equipped with an efficient stripping system
- 2.2.4 Residue quantities established at survey

2.3 Inspection of Cargo Record Book (CRB)
- 2.3.1 Copy sufficient pages of the CRB to cover a full loading/unloading/ballasting and tank cleaning cycle of the ship; Also copy the tank diagram

FIGURE E1-12—Continued

2.4 Inspection of log book
- 2.4.1 Last port, date of departure, draught forward and aft
- 2.4.2 Current port, date of arrival, draught forward and aft
- 2.4.3 Ship's position at or near the time the incident was reported
- 2.4.4 Spot check if times entered in the cargo record book in respect to discharges correspond with sufficient distance from the nearest land, the required ship's speed and with sufficient water depth

2.5 Inspection of other documentation on board
- 2.5.1 Other documentation relevant for evidence (if necessary make copies) such as:
  - 2.5.1.1 cargo documents of cargo presently or recently carried, together with relevant information on required unloading temperature, viscosity and/or melting point
  - 2.5.1.2 records of temperature of substances during unloading
  - 2.5.1.3 records of monitoring equipment if fitted

2.6 Inspection of ship
- 2.6.1 Ship's equipment in accordance with the P&A Manual
- 2.6.2 Samples taken; state location on board
- 2.6.3 Sources of considerable leakage
- 2.6.4 Cargo residues on surface of segregated or dedicated clean ballast
- 2.6.5 Condition of pumproom bilges
- 2.6.6 Slop tank contents (estimate quantity of water and residues)

2.7 Statements of persons concerned If the CRB has not been properly completed, information on the following questions may be pertinent:
- 2.7.1 Was there a discharge (accidental or intentional) at the time indicated on the incident report?
- 2.7.2 Which tanks are going to be loaded in the port?
- 2.7.3 Which tanks needed cleaning at sea? Had the tanks been pre-washed?
- 2.7.4 When and where were these cleaned?
- 2.7.5 Residues of which substances were involved?
- 2.7.6 What was done with the tank washing slops?
- 2.7.7 Was the slop tank, or cargo tank used as a slop tank, discharged at sea?
- 2.7.8 When and where was the discharge effected?
- 2.7.9 What are the contents of the slop tank or cargo tank used as slop tank?
- 2.7.10 Which tanks contained the dirty ballast during the ballast voyage (if ship arrived in ballast)?
- 2.7.11 Which tanks contained the clean ballast during the ballast voyage (if ship arrived in ballast)?
- 2.7.12 Details of the present voyage of the ship (previous ports, next ports, trade)
- 2.7.13 Difficulties experienced with discharge to shore reception facilities
- 2.7.14 Difficulties experienced with efficient stripping operations
- 2.7.15 Which tanks are clean or dirty on arrival?
- 2.7.16 Repairs carried out or envisaged in cargo tanks

FIGURE E1-12—Continued

2.8 Miscellaneous information
2.8.1 Comments in respect of condition of ship's equipment
2.8.2 Comments in respect of pollution report
2.8.3 Other comments

3. INVESTIGATION ASHORE

3.1 Analyses of samples
3.1.1 Indicate method and results of the samples' analyses

3.2 Further information
3.2.1 Additional information on the ship, obtained from terminal staff, tank cleaning contractors or shore reception facilities may be pertinent

NOTE: Any information under this heading is, if practicable, to be corroborated by documentation such as signed statements, invoices, receipts, etc.

3.3 Information from previous unloading port terminal
3.3.1 Confirmation that the ship unloaded, stripped or pre-washed in accordance with its P&A Manual
3.3.2 The nature of difficulties, if any
3.3.3 Restrictions by authorities under which the ship was permitted to sail
3.3.4 Restrictions in respect of shore reception facilities

4. INFORMATION NOT COVERED BY THE FOREGOING

5. CONCLUSION

5.1 Summing up of the investigator's conclusions
5.2 Indication of applicable provisions of Annex II to MARPOL 73/78 which the ship is suspected of having contravened
5.3 Did the results of the investigation warrant the filing of a deficiency report?

Category B and C - Potentially Solidifying or High Viscosity

(2) Category B and C - Potentially Solidifying or High Viscosity. A cargo is determined to be a solidifying or a high viscosity substance only at the time of offloading. Those cargoes which have the "potential" for being high viscosity substances contain a reference to "908(a)" in the "Special Requirements" column of Table 1 of 46 CFR 153. Those that are potentially solidifying substances contain a reference to "908(b)" in the Table. A pre-wash of the cargo tanks and transfer of the NLS residue/water mixture ashore in accordance with 46 CFR 153 is required for these cargoes under the following conditions:

(a) Category B high viscosity NLS, if unloaded at a temperature where the viscosity is greater than 25 mPa.s;

(b) Category C high viscosity NLS, if unloaded OUTSIDE of a Special Area at a temperature where the viscosity is greater than 60 mPa.s;

(c) Category C high viscosity NLS, if unloaded INSIDE of a Special Area at a temperature where the viscosity is greater than 25 mPa.s;

(d) Category B and C solidifying NLS with melting point greater than 0° but less than 15°C, if the temperature of the cargo at the time of transfer is less than 5°C above the melting point of the NLS cargo; or

(e) Category B and C Solidifying NLS with a melting point greater than 15°C, if the temperature of the cargo at the time of transfer is less than 10°C above the melting point of the NLS cargo.

Cargo melting point and viscosity information may be obtained from the master. Under requirements in 46 CFR 153.908 the shipper is required to supply this information to the master.

For the purpose of establishing whether a potentially solidifying or high viscosity Category B or C NLS is unloaded at its proper temperature so as to avoid a mandatory prewash, the temperature of the NLS cargo may be measured by:

- a temperature sensor in the bottom of the tank in accordance with 46 CFR 153.440(a)(3);
- a portable temperature sensor in accordance with 46 CFR 153.440(c); or
- a system which measures the temperature of all interior cargo tank surfaces throughout unloading in accordance with 46 CFR 153.1108(c).

(FIGURE E1-13 To Be Added Later In Electronic Version)

(3) Procedures For Determining Whether An NLS Is A Potentially Solidifying and/or High Viscosity NLS And Whether These NLS Require A Pre-wash.

(a) To determine whether an NLS is a potentially solidifying and/or high viscosity NLS, find the name of the NLS in Table 1 of 46 CFR 153. Potentially high viscosity NLS's will have a reference to .908(a) in the Special Requirements column. Potentially solidifying NLS's will have a reference to .908(b) in the Special Requirements column. Some NLS's will have reference to both .908(a) and .908(b), indicating that they are both potentially solidifying and high viscosity.

(b) Record the IMO Annex II pollution category (A, B, C, D or III) from the first column of Table 1 in 46 CFR 153.

(c) Determining whether a potentially solidifying NLS needs a prewash.

(i) From the Bill of Lading or shipping papers find the melting point of the NLS.

(ii) If the melting point of the NLS is greater than O°C (32°F) and less than 15°C (59°F), the NLS must be unloaded at a temperature that is 5°C (9°F) or more above its melting point to NOT require a prewash.

(iii) If the melting point of the NLS is greater than 15°C, (59°F) the NLS must be unloaded at a temperature that is 10°C (18°F) or more above its melting point to NOT require a prewash.

(iv) Compare the actual NLS unloading temperature to the above requirements to determine if a pre-wash is required.

(v) For example, Cyclohexane, in Table 1 in 46 CFR 153, has a reference to .908(b) in the Special Requirements column. From the shipping papers, the melting point is 6.6°C. The unloading temperature is 20°C, which is more than 5°C above the NLS's melting point; therefore, a pre-wash is not required.

(d) Determining whether a potentially high viscosity NLS needs a prewash.

(i) From the Bill of Lading or shipping papers, find:

- For Category B NLS, the temperature at which it has a viscosity of 25 mPa.s
- For Category C NLS, the temperature at which it has a viscosity of 60 mPa.s

(ii) If the actual unloading temperature is greater than the temperature recorded in (a) above, then the NLS does not need a prewash.

(iii) For example, Cyclohexanol, in Table 1 in 46 CFR 153, is a Category C NLS and has a reference to .908(a) in the Special Requirements column. From the shipping papers the temperature at which Cyclohexanol has a viscosity of 25 mPa.s is 40°C. The unloading temperature is 45°C, which is greater than 40°C; therefore, the NLS does not require a prewash.

NOTE: The higher the temperature the less viscous a material and the smaller the value of mPa.s.

Other Situations Requiring a Pre-Wash

c. Other Situations Requiring a Pre-Wash.

(1) Category B and C Non High Viscosity or Non-Solidifying. Cargo tanks containing Category B or C non-solidifying or non-high viscosity NLS require pre-washing as described below:

(a) Category B. A ship operating under either the interim standards in 46 CFR 153.481(b) or under a "restricted voyage" waiver granted under 46 CFR 153.483 must pre-wash the appropriate tanks in accordance with the procedures specified in the ship's P&A Manual.

(i) Under the interim standards, the ship may discharge the NLS waste to either an adequate reception facility or to a slop tank for discharge at sea.

(ii) When operating under the "restricted voyage" waiver, the ship must discharge the pre-wash residue from these operations to an adequate reception facility. See section E1.E.7.e.(1) on "restricted voyage" waivers.

(b) Category C. A ship operating under a "restricted voyage" waiver granted under 46 CFR 153.483 must pre-wash the appropriate tanks in accordance with the procedures specified in the ship's P&A Manual. See section E1.E.7.e.(1) on "restricted voyage" waivers. The ship must discharge the pre-wash residue to an adequate reception facility prior to leaving the unloading port.

(c) Category B And C. In situations where more Category B or C cargo residue remains in a cargo tank and transfer piping because the tank(s) and piping were not capable of being unloaded in accordance with the unloading procedures specified in the ship's P&A Manual, the tank(s) must be pre-washed following the procedures specified in 46 CFR 153.1120, except as follows:

(i) The next cargo is one that can be loaded without the need to wash the tank and a waiver can be issued under 46 CFR 153.1114(a)(see section E1.E.7.e.(1)); or

(ii) Alternative unloading procedures have been used and it can be established that the appropriate tank(s) and piping contain less cargo residue than they would had they been unloaded in accordance with the unloading procedures specified in the ship's P&A Manual. See 46 CFR 153.1116(b).

Ventilation Tank Cleaning

d. Ventilation Tank Cleaning. As an alternative to prewashing, ships may clean tanks by ventilation when unloading Category A, B, or C cargoes whose vapor pressure exceeds 5 kPa (50 mbar) at 20°C (68°F). To clean tanks by ventilation, a ship must have an approved procedure in its P&A Manual. The ventilation procedure may be conducted at sea and does not have to be witnessed by the pre-wash surveyor. (Ventilation may be prohibited in port by state and local authorities.) The ship's P&A Manual will indicate for which cargoes and cargo tanks ventilation is permitted. The manual will also provide a general description of the ship's ventilation system and a description of how the ventilation equipment must be used for tank cleaning. This will include the following

(1) Number and type of fans required;

(2) Fan location;

(3) Minimum air flow or fan speed;

(4) Minimum time required for ventilation;

(5) Procedures and equipment for ensuring that the tanks are dry at the completion for ventilation; and

(6) Any special safety procedures to be followed during ventilating.

Pre-Wash Waivers

e. Pre-Wash Waivers. The requirement for pre-washing cargo tanks from which Category A, B, or C NLS was unloaded as outlined in section E1.E.2 above may be waived or otherwise be omitted under any one of the following conditions:

(1) For Category B and C NLS only (including potentially solidifying and high viscosity), Commanding Officer, G-MSC grants the ship a "restricted voyage waiver" which allows for the appropriate cargo tank(s) to be pre-washed only at those ports or terminals specified in the waiver (46 CFR 153.483 and 46 CFR 153.10).

(2) Commanding Officer, Marine Safety Center grants the ship a "dedicated cargo tank waiver" which eliminates pre-washing provided that the tank only carries the specific cargo listed on the vessel's Certificate of Inspection or Certificate of Compliance. If the tank is washed or ballasted, the wash water residue or ballast must be discharged to an adequate reception facility (46 CFR 153.491(a) and 46 CFR 153.10).

(3) A surveyor signs a statement in the Cargo Record Book that the next cargo has been determined to be one that may be loaded without washing the cargo tank(s) and the cargo tank(s) will not be washed or ballasted before it is reloaded (46 CFR 153.1114(a)).

(4) The cargo tank(s) will be cleaned by ventilation (46 CFR 153.1114(b)).

(5) The Coast Guard issues written authorization allowing the appropriate tank(s) to be pre-washed in another port. If the pre-wash port is a foreign port, authorization is granted by Commandant (G-MTH); if the pre-wash port is a U.S. port, authorization is granted by the COTP having jurisdiction over the unloading port. In both cases the procedures and criteria which need to be complied with before granting authorization are outlined in 46 CFR 1119(c).

(6) A schematic diagram outlining the relationship between cargo unloading, waivers, and pre-wash operations is provided as figure E1-14.

Pre-Wash Surveyor Duties and Procedures

f. Pre-Wash Surveyor Duties and Procedures.

(1) Notification. As required by 33 CFR 151.43 the ship must contact the COTP at least 24 hours before a pre-wash surveyor is needed. Items (a) through (e) listed below are required in the notification. Additionally, other information which will assist in coordinating pre-wash operations is listed.

(a) Ship's name;

(b) Expected time the pre-washing operations will commence (Pre-wash surveyors must arrive by this time, unless the pre-wash time is postponed by the ship);

(c) NLS (by name and category) to be unloaded from the tanks to be pre-washed;

(d) Estimated volume of pre-wash residue to be discharged;

(e) Name and amount of any tank cleaning agent(s) to be used;

(f) Name and location of the unloading terminal;

(g) Ship's expected time of arrival (ETA) at the unloading terminal;

(h) Cargo tank(s) to be pre-washed;

NOTE: Pre-wash surveyors should also check to ascertain that the cargo tank(s) to be pre-washed are loaded with Category A substances – only Category A pre-washes are required to be witnessed by a pre-wash surveyor.

(i) Intended disposition of residues, i.e., reception facility at visiting terminal or a reception facility at another port; and

(j) Name and location of the reception facility (if other than the unloading terminal).

Preliminary Preparations

(2) Preliminary Preparations.

(a) Upon receipt of the above information, and as a preliminary safety measure, pre-wash surveyors should familiarize themselves with the characteristics of the NLS to be pre-washed, particularly those related to toxicity. Such information can be found in the USCG Chemical Data Guide (CIM 16616.6), the CHRIS Manual (COMDTINST 16465.11 and .12 and the chemical data sheets found in Volumes 2 and 3 of the International Chamber of Shipping (ICS) Tanker Safety Guide (Chemicals). It is anticipated that many of the pre-wash operations will be conducted with portable tank washing equipment lowered into position through open "butterworth" holes in the deck. The use of portable tank washing machines can pose particularly acute hazards when tank covers must be removed and the possibility of splash hazard in the area of the tank opening is increased. Consequently, particular attention should be given to the health hazard information contained in the above documents as well as any recommendations they may contain for protective clothing needed for working in the vicinity of these cargoes. Pre-wash surveyors should be prepared to use this personal safety equipment. When equipment is not available to match the level of threat of the chemical involved and/or method of pre-wash involved, surveyors should view the operation at a safe distance. When viewing the operation at a distance, verify compliance with the P&A Manual as much as practical. The start of portable tank cleaning machines can be determined by witnessing the motion of the portable hoses. Often, the pump gauges are located in cargo control rooms at a safe distance from the pre-wash operations. These methods and others should be employed to maximize the surveyor's personal safety and verify compliance with the pre-wash requirements.

(b) Review the vessel's history from the MSIS and confirm the time the pre-wash is expected to commence.

(3) Arrival at the Terminal. Operating expenses for oceangoing chemical carriers typically run in the thousands of dollars per hour. Surveyors should ensure pre-wash operations are not delayed due to their late arrival. The pre-wash surveyor, upon arrival at the terminal, should make introductions, advise the reason for visit, examine the terminal's Certificate of Adequacy (COA) to ensure that it is valid and that the reception facility is approved for the NLS to be unloaded. The pre-wash surveyor should also obtain from the appropriate personnel any information which might impact on the ability to conduct cargo discharge and/or pre-wash operations in accordance with the procedures specified in the ship's P&A Manual, e.g., terminal or reception facility pipeline temporarily out of service, etc.

(4) Arrival Aboard The Vessel. Upon boarding the ship, the pre-wash surveyor should introduce himself to the master or chief officer, and request the following documents:

(a) U.S. Flag Ships:

(i) An endorsed Certificate of Inspection (COI) to carry MARPOL Annex II NLS;

(FIGURE E1-14 To Be Added Later In Electronic Version)

(ii) Cargo Plan and Bill of Lading (shipping papers);

(iii) P&A Manual; and

(iv) Cargo Record Book.

(b) Foreign Flag Ships:

(i) A Certificate of Compliance (COC) with Subchapter O Endorsement (SOE) to carry MARPOL Annex II NLS and the vessels's COF when appropriate. [NOTE: Foreign flag ships calling at U.S. ports for the first time will not possess the endorsed COC. Prior to arrival such ships must have submitted their COF to Commanding Officer, Marine Safety Center and received acceptance and arranged with the OCMI for an examination for issuance of the COC.];

(ii) Cargo Plan and Bill of Lading (shipping papers);

(iii) P&A Manual; and

(iv) Cargo Record Book.

(c) Using the above documents the pre-wash surveyor should then confirm the following:

(i) The NLS's to be unloaded at the terminal, their categories, and cargo tank location (refer to the ship's cargo plan, Bill of Lading, P&A Manual and Cargo Record Book);

(ii) The cargo tanks from which Category A NLS's will be unloaded (refer to the ship's cargo plan, Bill of Lading, P&A Manual);

(iii) The pre-wash procedures to be used in each cargo tank (refer to the ship's P&A Manual); and

(iv) The required disposition of the pre-wash residue (refer to previous sections E1.E.1-E1.E.3 and E1.E.5).

Pre-wash Operations

g. Pre-wash Operations.

(1) Ships will normally be ready to begin pre-wash operations when the cargo tank(s) is empty and as soon as possible after stripping. However, pre-wash operations may not begin until the pre-wash surveyor is aboard the ship for Category A NLS's, and they must be conducted in accordance with the pre-wash procedures described in the ship's P&A Manual. In addition to providing a general description of the ship's tank cleaning system, the P&A Manual will describe how the tank cleaning must be conducted. This will include the following:

(a) Number and type of washing machines to be used;

(b) Machine location;

(c) Minimum washing pressure;

(d) Minimum number of washing machine cycles (or the minimum time required for each pre-washing operation);

(e) Minimum water temperature (where applicable);

(f) Tank cleaning agents which may be used (where applicable); and

(g) In instances where the tank(s) cannot be washed with water, the tank cleaning agents or washing medium to be used including an indication of when the actual “pre-wash” commences.

(2) During pre-wash operations, the pre-wash surveyor should determine that the fluid pressure, temperature, etc. are as specified in the ship's P&A Manual. The appropriate gauges and thermometers will normally be found in the ship's cargo control room or pump room. Pre-wash surveyors should also determine that the washing machines are operating. This can be accomplished by listening as the washing machine washes the tank. During the washing operation the washing machine will normally generate an audible sound as the fluid stream passes across the tank top. The sound is particularly noticeable for fixed in-place tank cleaning machines. For filed in-place machines utilizing portable drives, pre-wash surveyors should also visually determine that the machines are washing the tank throughout the "washing cycle" specified in the ship's P&A Manual. Portable drives are generally outfitted with indicators for this purpose.

(3) Pre-wash surveyors should accomplish the above tasks on a "spot check'' basis standing upwind of the appropriate cargo tank(s) whenever possible.

(4) For Category A cargoes, it may also be necessary to measure the concentration of the pre-wash residue to ensure that it is less than the maximum permitted by the regulations, i.e., 0.1% (by weight). See 46 CFR 153.1120(a). The ship's P&A Manual will identify which Category A cargoes require this measurement and it will list the equipment and procedures necessary to accomplish this procedure.

(5) When enough pre-wash residue has been collected in the tank bottom for the pump to gain suction, the cargo or stripping pump must be started and the pre-wash residue pumped out. Where a measurement of the pre-wash concentration for some Category "A" is required, this is to be accomplished and/or arranged for by the ship. The pre-wash surveyor should witness the chemical analysis and ensure that the discharge concentration meets the criteria for the specific Category A NLS.

Cargo Record Book Entries for Pre-Wash Operations

h. Cargo Record Book Entries for Pre-Wash Operations. The pre-wash surveyor must make the appropriate entries in Section J to the ship's Cargo Record Book (CRB) at the completion of any mandatory pre-wash operation. The ship's officer will complete section D, items 12-14 of the CRB.

F. MARPOL 73/78 ANNEX V GUIDANCE AND PROCEDURES

1. Applicability The U.S. regulations to implement Annex V apply to all inspected or uninspected marine craft, regardless of flag, on the navigable waters and within the 200 mile Exclusive Economic Zone (EEZ) and to U.S. ships wherever they are located. Vessels exempt from Annex V include foreign flag warships, naval auxiliaries, or other ships owned and operated by a country when engaged in non-commercial service and, until December 31, 1993, U.S. public vessels. Ships subject to Annex V are prohibited from discharging plastics into the sea and are limited in discharging floating dunnage, lining and packing materials, paper, rags, glass, metal, bottles, crockery and similar refuse, and food waste. The Annex requires Party nations to ensure ports and terminals provide adequate reception facilities to receive ship-generated garbage. General enforcement guidance is in chapter 4 of volume I of the Marine Safety Manual.

2. Discharge Restrictions

a. No person on board any ship may discharge garbage into the navigable waters of the U.S.

b. Further restrictions based on garbage type:

Garbage Type	Disposal
Plastics - includes synthetic ropes, fishing nets, plastic bags and biodegradable plastics	• Prohibited in all areas
Floating dunnage, lining and packing materials	• Prohibited less than 40 kilometers (25 miles) from nearest land
Food waste or paper, rags, glass, metal, bottles, crockery and similar refuse	• Prohibited less than 19.2 kilometers (12 miles) from nearest land
Comminuted or ground food	• Prohibited waste, paper, rags, glass, etc.less than 4.8 kilometers (3 miles) from nearest land

3. Incinerated Plastic

The IMO's "Guidelines for the Implementation of Annex V" states that "plastic garbage must be retained on board ship unless ...reduced to ash by incineration." Therefore, if plastic has been incinerated so that only ash remains, the ash may be discharged. However, "clinkers" or any hard residue that remains from the incineration of plastic shall be treated as plastic under Annex V and cannot be discharged at sea. Vessel crew should be educated on this issue and advised to retain receipts from shore disposal of plastic clinkers. Plastic is most effectively reduced to ash by high intensity incinerators.

4. Operational Requirements for Ships

There are several ways to discharge ship-generated garbage in accordance with the rules. If plastics are separated from other garbage on board ship, the remaining garbage may be incinerated, retained on board for later shore disposal, or discharged at sea where allowed. If plastics are not separated from other garbage on board ship, garbage containing mixtures of plastic and other garbage must be incinerated on board ship or retained on board for later shoreside disposal. If the master, operator or person in charge of a ship operates with plastics aboard the ship which require disposal and cannot show compliance with the regulations (bags of garbage being held for shore disposal or reception facility receipts), these factors may be used as evidence that Annex V of MARPOL 73/78 has been violated. 33 CFR 151.63 contains a listing of some means by which a ship's master could show that the ship is in compliance with the regulations and Annex V.

5. Operational Requirements for Fixed or Floating Platforms and Associated Vessels

Discharge restrictions for offshore platforms, rigs, and associated vessels not only prohibit the disposal of plastics, but prohibit the disposal of all types of garbage less than 19.2 kilometers (12 miles) from nearest land. Food waste, which is comminuted or ground so that it passes through a screen with openings no greater than 25 millimeters (one inch), may be discharged from fixed or floating platforms or from a ship within 500 meters of a platform, if the platform is beyond 12 nautical miles (21.6 kilometers) from nearest land. Boarding officers and inspectors should take note that after 31 December 1988, an oil rig or platform operator could be in compliance with a valid EPA National Pollution Discharge Elimination System (NPDES) permit issued pursuant to regulations authorized under the Clean Water Act and not be in compliance with Annex V provisions, because the Annex V implementing regulations go beyond the requirements of the NPDES permitting system. The EPA's NPDES permits issued to oil rigs and platforms prohibit the discharge of floating solid wastes and garbage, but allow sinkable wastes to be discharged unless specifically prohibited. Under Annex V, a higher standard is required for oil rigs and platforms, since no discharge of garbage (except comminuted food wastes beyond 12 nautical miles (21.6 kilometers)) is allowed. Because of this disparity between the NPDES process and Annex V requirements, the EPA has indicated that it is considering in future NPDES permits to require oil rigs and platforms to comply with Annex V.

6. APHIS Vessel Monitoring Program

The Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture (USDA) is a primary source of possible Annex V violation information for all vessels arriving in the U.S. from foreign ports. USDA regulations prohibit vessels which have called at foreign ports (except Canada) from bringing ashore for disposal food, food wastes or waste which has been in contact with food unless certain requirements are met. Special handling and incineration or sterilization by APHIS approved disposal companies are required if vessels wish to dispose of this type of waste while in port. These requirements are intended to prevent the introduction of bacteria and insects into the U.S. which could be harmful to plants or animals. The goal of APHIS is to inspect all vessels which have called at foreign ports to verify compliance with these requirements. (In some regions, APHIS does not have the resources to board 100% of foreign arrivals.) During the course of their normal boardings, APHIS inspectors will determine compliance with ANNEX V requirements and will report any suspected violation to the local Captain of the Port (COTP) on PPQ Form 288, Figure E1-15. If resources permit, vessels suspected of violations by APHIS officers should be boarded by Coast Guard personnel to verify that the vessel is not in compliance with MARPOL V requirements and collect additional evidence.

> **NOTE**: Even if the Coast Guard is unable to board a vessel suspected by APHIS of an Annex V violation, the report may still provide sufficient. evidence for a civil penalty case, or referral to the vessel's flag state if U.S. jurisdiction cannot be proven.

FIGURE E1-16: MARPOL ANNEX V BOARDING CHECKLIST

NOTE: Intended as review only. For further guidance, refer to volume II, chapter E1, section F of the Marine Safety Manual.

1. Review APHIS Boarding Report, if available, and determine whether it indicates a MARPOL V violation.

- Verify vessel name, flag, registration number, call sign?

2. Review Shipboard Garbage Handling Practices.
   - Is the crew familiar with the requirements of MARPOL Annex V?
   - How is ship-generated garbage disposed of?
   - Are plastics used on board? Is there plastic in the ship's stores?
   - Are plastics segregated from other garbage for disposal ashore?
   - Is there garbage/plastics to be disposed of ashore?
   - Are there shipboard spaces used for collecting and storing shipboard garbage?
   - Is there a functioning incinerator on board? Is it used for incinerating plastics and other garbage? Are the residual plastic "clinkers" retained for disposal ashore?
   - Is there a grinder or comminuter on board used for discharge of garbage between 3 and 12 nautical miles (5.4 and 21.6 kilometers)?
   - Are there receipts available from garbage discharges at port reception facilities?
   - Are there log entries indicating garbage disposal at sea?
   - Although not yet required, does the vessel keep a garbage discharge log indicating dates, locations, amounts, types and methods of garbage discharge?
   - Are there ongoing educational programs to train shipboard personnel in garbage handling procedures?
   - Although not required for foreign vessels, is there a written shipboard waste management plan and are garbage disposal placards displayed?

3. Check for MARPOL Annex V Placards and Waste Management Plans. (U.S. VESSELS ONLY)
   - For vessels 12 m (40 ft) and greater in length, is there a waste management plan on board? Is there a designated crew member responsible for carrying out the plan?
   - For vessels 7.92 m (26 ft) and greater in length, are there Annex V placards placed in prominent locations on board?

FOR GENERAL ENFORCEMENT GUIDANCE, SEE THE MARINE SAFETY MANUAL VOLUME I, CHAPTER 4.

7. General Boarding Guidance

a. At Sea. Inspected and uninspected ships such as fishing vessels and recreational craft may be encountered by Coast Guard boarding officers during other routine activities; i.e., fisheries patrols, pollution investigations, marine casualty investigations or other law enforcement activities. Since there are no special equipment requirements, the Annex V portion of any boarding will consist of a review of the use of plastics on board and the crew's garbage handling and disposal practices for ship-generated waste. Virtually every vessel is subject to Annex V. Coast Guard units are not expected to conduct additional boardings exclusively for Annex V. Annex V compliance checks should be conducted as resources permit and in conjunction with other routine activities. Boarding officers may use the checklist provided in Figure E1-16 to aid them in an Annex V compliance check.

b. In Port. No special or exclusive Coast Guard boarding will be required to monitor compliance with Annex V. However, COTP's shall include, as part of their vessel monitoring program, the review of Annex V requirements and continue to board only "high priority" vessels as defined in chapter 2 of volume I of the Marine Safety Manual, COMDTINST M16000.6. Boarding officers shall verify if an APHIS inspection has been done by observing the copy of the PPQ FORM 288 left on board. **Even if the form is aboard the vessel, the boarding officer shall conduct a follow-up Coast Guard check for compliance with Annex V.

Vessel operators will prioritize Annex V compliance based on the level of interest expressed by the Coast Guard. If an APHIS inspection has not been conducted, particular attention should be given to shipboard garbage handling practices, use of plastics and any evidence of possible illegal discharges. Boarding officers may use the checklist provided in Figure E1-16 to aid them in an Annex V compliance check.

Since U.S. flag vessels solely engaged in coastwise trade and other non-oceangoing vessels will not normally be boarded by APHIS inspectors, Coast Guard boarding officers should determine compliance with the requirements of Annex V when on board these vessels. If plastics are observed on board, there should be clear evidence of the crew's degree of compliance with Annex V provisions; e.g., use of an on board incinerator; or where an incinerator is not used, accumulated plastic waste being retained for disposal ashore; or receipts from shore disposal. The garbage-handling practices on board the ship should be reviewed, the crew educated on discharge restrictions, and any evidence of noncompliance noted on the boarding form. For U.S. vessels, the waste management plan should be reviewed.

When conducting in-port boardings, the following procedure should be followed to determine compliance:

(1) Verify that an APHIS boarding has been conducted for this port call by inspecting the APHIS form for name and flag of the ship, date of inspection, Plant Protection Quarantine (PPQ) officer's signature and any coments concerning Annex V discrepancies. This form is required to be left on board with the master or chief steward after an APHIS inspection.

(2) In cases where there has not been an APHIS boarding, determine how the vessel is complying with the Annex V discharge restrictions, particularly how and where it is disposing of its plastic waste. Some of the factors to be considered and documented by the boarding officer in evaluating compliance are:

(a) Records, including receipts, of garbage discharges at port reception facilities;

(b) Log entries indicating discharge of garbage;

(c) The presence and operability of equipment to treat ship-generated garbage, including, but not limited to, incinerators, grinders, or comminuters;

(d) The presence of and adherence to a written shipboard waste management plan;

(e) The amount or absence of plastics in ship stores;

(f) Ongoing educational programs to train shipboard personnel of garbage handling procedures; and

(g) The presence of shipboard spaces used for collecting, processing, storing, and discharging ship-generated garbage.

(3) The most difficult aspect in establishing MARPOL V violations is proving U.S. jurisdiction. Even if a vessel master admits that all garbage, including plastics, is discharged at sea, it is sometimes impossible to prove that the discharge occurred within U.S. waters. If by witnesses' statements or by log entries of garbage discharge and ship position, jurisdiction can be established, enforcement actions should be taken in accordance with Chapter 4 of Volume I of the Marine Safety Manual and the case processed for civil penalty.

As of July 1992, the Coast Guard began taking enforcement action under U.S. law, including referral to the Department of Justice, for all suspected MARPOL Annex V violations occurring within the U.S. EEZ. Prior to July, Coast Guard policy had been to forward cases involving vessels of signatory nations (unless the violation occurred within three nm) to the flag State administration for investigation and enforcement. The policy shift expanding coverage out to the EEZ became necessary because flag States were not taking adequate action in the cases forwarded by the U.S. Countries often failed to acknowledge receipt of the cases and many took little if any legal action against suspected vessels.

(4) Building A Case Under MARPOL 73 /78 ANNEX V. If circumstances discovered during a boarding indicate a possible MARPOL V violation or if an incriminating report is received from another agency, vessel passenger, or vessel crew member, the following information should be collected to establish a civil penalty case: (Figure E1-17)

Information Class	Information to Collect
Vessel Data	• Vessel type; length of ship; last port of call/date; next port of call/date, distance of voyage; number of crew members.
Discharge Data	• Type of suspected discharge (oil, chemical, garbage/plastics); date/time of discharge; quantity of discharge; cause of discharge; description of discharge.
Location Data	• Location of ship when discharge occurred (Lat/Long, if known); body of water; miles from shore, if known.
Evidence	• Ship master's explanation, statement from witnesses, crew members or passengers; photographs or video tapes; discharge samples taken.
Observer Data	• Name/address of observer; phone; date/time of report; location of observer at time of observation.

While it is ideal to collect the information listed above, such details are often not available, especially during a Coast Guard or APHIS boarding. In most of these cases, there will be only prima facie evidence. However, these cases should be developed to the fullest, and, when jurisdiction can be established, forwarded for prosecution. A prima facie case that plastics have been discharged in violation of Annex V may be established if:

(a) There are no plastics on board for disposal ashore;

(b) It is evident from inspection that plastic materials are used on the vessel;

(c) There is no functional incinerator on board or other reasonable explanation as to lawful disposal practices; and

(d) There is no evidence of disposal to a reception facility since the vessel's arrival in port.

**An APHIS PPQ Form 288 (Figure E1-15) alone containing certain information can be the basis for a strong prima facie MARPOL V case. If the PPQ Form 288 indicates that the crew of a vessel uses plastic materials, but that the vessel has arrived in port after several days at sea with fl~ plastic trash on board, and if the vessel has no incinerator or receipts from shore disposal, there may be sufficient evidence to prove that the violation occurred in water subject to the jurisdiction of the U.S. To build such a case successfully, the COTP must consider several factors: where was the vessel's last port of call, the length of the vessel's voyage, the number of crew members, and the estimated amount of time the vessel traveled in water subject to the jurisdiction of the U.S. before entering port. It can be assumed that waste including plastic is generated during each shipboard meal. If a vessel has traveled the last leg of a journey in U.S. waters (often a distance of 200 nautical miles (360 kilometers) or more, over a time period of 12 hours or more) and arrives in port with no trash at all, it is likely that trash generated during that time period was discharged in water subject to the jurisdiction of the U.S. prior to entering port. (This determination of U.S. jurisdiction cannot be made when an area's EEZ does not extend out to 200 nautical miles (360 kilometers), such as around Miami.) To strengthen the case, the COTP should contact the vessel's previous and subsequent ports of call to determine and document whether the vessel off loaded waste in either port.

If U.S. jurisdiction cannot be established, whether it be an APHIS-generated case or any case of suspected noncompliance with MARPOL, it is important that the case be forwarded to the vessel's flag State for enforcement action. In these cases, the evidence should be documented by using the MSIS PSAR/PSDR product set and the evidence (PPQ Form 288, CG boarding form, photos, etc.) forwarded to G-MOR for transmittal to the flag State. These cases should be sent to G-MOR within two weeks of the boarding or receipt from APHIS in order to forward the information to the flag state in a timely manner. Each unit should maintain copies of the case files forwarded for flag State enforcement.

8. Class D Felony Cases/ Referral to Department of Justice

Cases in which MARPOL 73/78 Annex V is proven to have been "knowingly" violated are considered class D felony cases punishable by imprisonment of not more than 6 years (18 U.S.C. 3581(b)(4)1 and a fine of not more than $250,000 for an individual (18 U.S.C. 357l(b)(3)) or not more than $500,000 for an organization (18 U.S.C. 3571(c)(3)1. Class D felony MARPOL cases shall be developed for referral to the U.S. Attorney via D(l).

9. Reports From Private Citizens

All Coast Guard units should be prepared to receive reports of violation from the public, interested parties, environmental groups, state and local agencies, and other Federal agencies. Coast Guard personnel are directed to be responsive to callers and immediately record any such violation reports. Captain of the Port (COTP) offices, groups and small boat stations may use the Observer Marine Pollution Sighting Report (Figure E1-17) to record as much useful information as the caller can provide. Groups and stations shall send reports of MARPOL violations to the nearest COTP for action. COTPs shall send a letter acknowledging all citizen reports received and provide the reporting party with an explanation of the steps being taken to process the case.

10. Placards, Waste Management Plans, and Refuse Record-Keeping for Ships

a. Placards. All U.S. vessels 8 meters or more in length and floating platforms in transit must display MARPOL Annex V placards in prominent locations and in sufficient numbers so that they can be read by the crew and passengers. The placards must inform the reader of the discharge restrictions of Annex V. Specific requirements for the placards can be found in 33 CFR 151.59. Foreign flag vessels are not required to have placards.

Waste Management Plans

b. Waste Management Plans. All oceangoing U.S. vessels of 12 m (40 ft) or more in length and all fixed or floating platforms are required to maintain a written waste management plan on board. Specific requirements for the placards can be found in 33 CFR 151.57. Foreign flag vessels are not required to have waste management plans. The plan should:

(1) Provide for the discharge of garbage by means that meet Annex V requirements;

(2) Describe the procedures for collecting, processing, storing, and discharging garbage; and

(3) Designate the person who is in charge of carrying out the plan.

Refuse Record-Keeping for Ships

c. Refuse Record-Keeping for Ships. A notice of proposed rulemaking was published in the Federal Register May 20, 1993 requesting public comment on the proposal to require all manned oceangoing U.S. vessels 12 m (40 ft) or more in length, engaged in commerce and all fixed and floating platforms to keep records of garbage discharges and disposals. This requirement specifies only the content of information that should be recorded without specifying in what format or document it be kept. When the final rule is published and 33 CFR 151.55 has been amended, boarding officers will check the garbage discharge entries to determine waste handling practices and level of compliance. This requirement is mandated by the Marine Plastic Pollution Research and Control Act of 1987.

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11. Violations and MSIS Entries MARPOL Annex V cases shall be entered into MSIS in the Marine Casualty or Port Safety product sets depending upon the circumstances of the case.

a. MARPOL Annex V discharge violation in which U.S. Jurisdiction can be proved shall be entered into the Marine Casualty (MC) product set. You are required to file a Marine Casualty Description Details (MCDD) for each case as follows:

(1) Under event: Fill in Type as “pollution”; Class as “minor”; State as “vessel’s stores”; and leave Prec. Events blank.

(2) Under Causal/Enabling Factor: fill in CAT as “EF”; SUBJ as 1 (unless more than one vessel); TYPE as “HA” (Habitation); MODIFIER 1 as “NEC.”

(3) Mark “X” in the supplement slot to file an Marine Casualty Discrepancy Report (MCDR).

(4) Complete MCDR, using "discharge of plastic or garbage" as description for NEC. Mark "Y" in Legal Actions entering "SPEC" as 33 CFR 151.67.

(5) Process a Marine Violation (MV) case identifying this (MC) case number as the detection case.

MARPOL Annex V Discharge Violations

b. MARPOL Annex V discharge violations in which U.S. jurisdiction cannot be proved and the case will be forwarded to G-MOR for flag State referral shall be entered into the Port Safety Activity Report/Port Safety Discrepancy Report (PSAR/PSDR) using the following codes: system (HA); sub-system (NEC); description for "NEC" (DISCHARGE OF PLASTICS).

MARPOL Annex V Prevention Violations

c. MARPOL Annex V prevention violations (placards, waste management plans, refuse record books) shall be entered into PSAR/PSDR using the following codes:

FOR PLACARD VIOLATIONS:	*System*	(DOCS,LIC,PMTS)
	Sub-System	(NEC)
	Description for "NEC"	(NO MARPOL PLACARD)
FOR WASTE MANAGEMENT PLAN VIOLATIONS:	*System*	DOCS, LIC, PMTS)
	Sub-System	(PLAN)
	Specific Sub-System Item	(NEC)
	Description for "NEC"	(NO MARPOL V MGMT PLAN)
FOR REFUSE RECORDKEEPING VIOLATIONS:	*System*	DOCS, LIC, PMTS)
	Sub-System	(RECORD BOOK)
	Specific Sub-System Item	(NEC)
	Description for "NEC"	(NO REFUSE RECORDS)

G. MARPOL 73/78 REPORTING REQUIREMENTS AND INSTRUCTIONS

Open, clear and timely communication both within the Coast Guard and among Parties to MARPOL 73/78 and the International Maritime Organization (IMO) is paramount to the effective and consistent implementation of MARPOL 73/78. As a Party, the U.S. is required to cooperate in the detection of violations and the enforcement of MARPOL 73/78, to use all appropriate and practical measures for detection and environmental monitoring, and to institute adequate procedures for reporting and accumulating evidence (Article 6). To comply with this provision of MARPOL 73/78, it is necessary for the Coast Guard to submit annual reports concerning alleged violations, spill response activities, enforcement actions and programmatic information to the IMO and to other Parties.

1. Notification

COTPs shall notify G-MOR in writing of all MARPOL cases being processed against foreignf lagged vessels (both for flag State referral and U.S. penalty action). Under the Law of the Sea convention, the U.S. is required to notify flag State administrations of all MARPOL violations against foreign vessels.

a. In MARPOL cases in which U.S. jurisdiction cannot be established, COTPs shall continue to send G-MOR all case evidence to be fowarded for flag State enforcement.

b. In MARPOL cases where the Coast Guard can prove U.S. jurisdiction and intends to process for penalty, COTPs need only send basic information (vessel name, vessel identification number and MSIS case number) to notify G-MOR that a case has been initiated. G-MOR will then notify the flag State administration of the pending case.

2. Offshore Sighting Reports

Commanding officers of oceangoing surface units and aircraft commanders shall report sightings of discharges (Oil, NLS or garbage) as follows:

Units shall report by PRIORITY message addressed to the Coast Guard's National Response Center with an information copy to Commandant (G-MOR) with the following sighting information:

P (Date Time Group)
FROM: (Name of unit)
TO: COGARD NATIONAL RESPONSE CENTER WASHINGTON DC
INFO: COMDT COGARD WASHINGTON DC//G-MOR//
Parent Area
Parent District
Districts in which patrol was conducted
Other addresses as appropriate
BT
UNCLAS //16450//
SUBJ: MARPOL ENFORCEMENT REPORT
1. Discharge Sighting Information:
A. Discharge Sighting #1
(1) Location of discharge
(2) Date and time of sighting
(3) Name and flag or home port of suspect ship
(4) Ship's position at time of sighting
(5) Ship's last port of call
(6) Ship's next port of call
(7) Discharge size and amount
(8) Name(s) of person(s) making report
(9) Additional information
B. Discharge Sighting #2, #3, etc...(Provide same information as above)

3. Vessels of Particular Interest (VPI) Notices

Upon receipt of a report of violation, Commandant (G-MOR) will designate ships suspected of unauthorized discharges as Vessels of Particular Interest (VPI) in MSIS for high priority boarding at the next U.S. port of call. The Coast Guard will board suspected U.S. or foreign ships in ports under U.S. jurisdiction to investigate alleged MARPOL 73/78 violations. The VPI message will follow the standard format below.

> ***MARPOL VPI (number)*** 14/V (ship name) IS
> SUSPECTED OF VIOLATING MARPOL 73/78 (date) AT
> (location). BOARD AT NEXT U.S. PORT AND
> CONDUCT INVESTIGATION. NOTIFY COMDT (G-MOR)
> BY ROUTINE MESSAGE OF INVESTIGATION RESULTS AND
> ENFORCEMENT ACTIONS TAKEN • **

4. Observer Marine Pollution Sighting Report

Personnel observing discharges offshore or noting evidence of illegal discharge during an inspection may complete an Observer Marine Pollution Sighting Report (Figure E1-17) to document their observations. It should be included in an MSO/COTP investigation. This format may be used for reports from anyone for any type of discharge.

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CHAPTER 2: INSPECTIONS RELAVENT TO SOLAS REQUIREMENTS

CHAPTER 2: INSPECTIONS RELATIVE TO SOLAS REQUIREMENTS

A. GENERAL PROCEDURES

1. Vessels to which SOLAS is Applicable

The International Convention for the Safety of Life at Sea (SOLAS) is a product of the International Maritime Organization (IMO), an agency of the United Nations. SOLAS applies to all mechanically propelled cargo and tank vessels of 500 or more gross tons (GT), and to all mechanically propelled passenger vessels carrying more than 12 passengers that engage in international voyages. By IMO's definition, an "international voyage" means a voyage from a country to which the Convention applies to a port outside the country, or vice versa. A vessel's "administration" is defined as the government of a country the flag of which the vessel is eligible to sail under. In this context, vessels operating "under the flag of the United States" are those documented or numbered under the laws of the U.S., including Guam, the Commonwealth of the Northern Mariana Islands, American Samoa, the District of Columbia, the U.S. Virgin Islands, and Puerto Rico. When possessing a valid SOLAS certificate and complying with its terms, such a vessel is entitled to all of the privileges described in the Convention.

> **NOTE:** On 22 May 1982, the organization changed its name from the Intergovernmental Maritime Consultative Organization, or IMCO. All IMCO resolutions passed prior to this change that remain effective are referred to below as "IMO" resolutions for simplicity.

2. Effective Date of SOLAS 74/78

The requirements of the 1974 Convention (SOLAS 74) became effective on 25 May 1980. The 1978 Protocol, which modifies the original Convention, became effective on 1 June 1981. Together, they are referred to as SOLAS 74/78. To apply the requirements of the Convention and the Protocol, a new vessel is one for which the keel was laid on or after these effective dates. An existing vessel is one for which the keel was laid prior to these dates. For convenience, SOLAS 74/78 has been reprinted in Commandant Instruction (COMDTINST) M16210.2.

3. SOLAS Amendments

Amendments to the Convention should be expected. The first set of amendments were adopted in November 1981, as Maritime Safety Committee (MSC) Resolution MSC.1(XLV). These amendments deal primarily with Chapters II-1 and II-2, although minor changes to Chapters III, IV, V, and VI are included. These changes came into effect on 1 September 1984. A second set of amendments was adopted in June 1983. These primarily affect Chapters III and VII, with minor changes to Chapters II-1, II-2, and IV. These amendments became effective on 1 July 1986.

4. U.S. Application of SOLAS 74/78

General

a. General. By ratifying SOLAS 74/78, the U.S. has agreed to promulgate statutes, regulations, and other measures to give the Convention full and complete effect. These measures will ensure that, from the aspect of safety of life, a subject vessel is fit for the service for which it is intended. The 1978 Protocol requires administrations to institute arrangements for inspection or establish a mandatory annual survey requirement. The U.S. has chosen the mandatory annual survey method, to be carried out through the mid-period inspection program (See Paragraph H.).

Authority

b. Authority. U.S. navigation and vessel inspection laws are used as authority to enforce the terms of the Convention; no special authority is necessary. Vessel inspection regulations in Title 46, Code of Federal Regulations (CFR) generally embrace the inspection requirements of SOLAS 74/78 (the only exceptions are requirements for radio equipment, which are administered by the Federal Communications Commission (FCC)). Inspection personnel generally need not refer to the Convention during inspections for certification. However, they shall be thoroughly familiar with SOLAS requirements, which may be considered when inspection decisions are made (particularly concerning relaxation of normal inspection requirements).

Application to T-Boats

c. Application to T-Boats. The regulations in 46 CFR, Subchapter T for small passenger vessels (under 100 GT) do not reflect the requirements of SOLAS 74/78, except by reference to the Convention. For T-boats operating on international routes, SOLAS 74/78 requirements shall be specifically applied, or SOLAS Exemption Certificates must be issued. Officers in charge, marine inspection (OCMI's) certificating T-boats that will operate on international voyages through other inspection zones should contact the OCMI's of those zones, to determine if additional requirements must be met for certification.

5. Previous SOLAS Conventions

The initial SOLAS Convention that entered into effect in 1929 was superseded in 1948, in turn in 1960, and again in 1974. SOLAS 74/78 incorporates by reference the 1929, 1948, and 1960 provisions applicable to existing vessels. In specific instances, modifications are required for existing vessels. Certificates granted under the 1929 and 1948 Conventions are no longer recognized by the Coast Guard. U.S. vessels having valid SOLAS 60 certificates may retain them until their normal expiration. All U.S. certificates issued after 25 May 1980 must be consonant with SOLAS 74. Those issued after 1 June 1981 must be consonant with SOLAS 74/78. The Coast Guard will continue to accept valid SOLAS 60 certificates held by vessels whose administrations are parties to SOLAS 60 but have not ratified SOLAS 74, or that issued such certificates prior to 25 May 1980.

6. Fire Safety Standards

➔ See Section D, Chapter 7 of this volume and Navigation and Vessel Inspection Circular (NVIC) 1-85, "Fire Safety Standards for Foreign Passenger Vessels."

B. REFERENCES

1. International Conventions and Conferences on Marine Safety

This publication contains the texts of the 1948 SOLAS Convention (including a summary of committee reports and background information) and the 1960 Convention. Each marine safety unit shall maintain COMDTINST M16707.1, as required by the Directives, Publications, and Reports Index, Commandant Notice (COMDTNOTE) 5600.

2. SOLAS 74/78 Protocols with Amendments

This publication contains the text of International Convention for the Safety of Life At Sea (SOLAS) 74 and the 1978 Protocol and Amendments. It may be purchased through local sources.

3. Implementing Regulations

SOLAS 74/78 requirements generally are incorporated in Title 46, CFR without specific mention of the Convention. Among the regulations that do make specific mention of SOLAS 74 and its application are:

	TYPE	CFR CITE
a.	All Vessels	46 CFR 2.01-25
b.	Tank Vessels	46 CFR Table 30.01-5(d) footnote 6, 30.01-5(e)(1), & 31.40
c.	Passenger Vessels	46 CFR Table 70.05-1(a) footnote 6, 70.05-3(b)(1), 70.05-10, and 71.75
d.	Cargo and Miscellaneous Vessels	46 CFR 90.05-1(a)(1), Table 90.05-1(a) footnote 6, 90.05-10, and 91.60
e.	Small Passenger Vessels	46 CFR 175.05-1, Table 175.05-1(a) footnote 6, 175.05-1(c), and 176.35
f.	Oceanographic Research Vessels	46 CFR Table 188.05-1(a) footnote 6, 188.05-10, 188.10-35, and 189.60

4. Marine Safety Manual

Volume I of the MSM contains a figure that lists countries that have ratified SOLAS 74/78 and other international conventions.

C. CERTIFICATES ISSUED UNDER SOLAS 74/78

➔ See MSM II, Section A, Chapter 3.

D. APPLICATION FOR CONVENTION CERTIFICATES

1. Application to the OCMI

The master, owner, or agent of a vessel for which a SOLAS Passenger Ship Safety Certificate, Cargo Ship Safety Equipment/Construction Certificate, or Exemption Certificate is desired shall submit Form CG-3752, Application for Inspection of U.S. Vessel. The application shall indicate all certificates desired. If a Cargo Ship Safety Construction Certificate is requested, the request shall also state whether the Coast Guard or ABS will issue it.

2. OCMI's Acknowledgement of Application

a. Passenger Vessels. The OCMI shall use Form CG-969, Notice of Completion of Examination for Safety Certificate. This document may be shown to explain the lack of a valid Passenger Ship Safety Certificate, if it is not received prior to the vessel's sailing.

b. Cargo, Tank, and Miscellaneous Vessels. Form CG-969 shall not be used to acknowledge application for Cargo Ship Safety Equipment Certificates. This certificate is issued by the OCMI, and is intended for issuance prior to sailing of the vessel.

3. Application to the FCC

The master, owner, or agent of a vessel for which a Safety Radiotelephony/Radiotelegraphy Certificate or Exemption Certificate is desired shall forward a written application to the local FCC office.

E. COORDINATION OF SOLAS BY THE FCC

1. Passenger Vessels

a. General. The inspection of a passenger vessel for issuance of a Passenger Ship Safety Certificate is conducted jointly by the Coast Guard and the FCC. The certificate is issued only after the Commandant has received reports of inspection from the OCMI and the FCC. Because it is desirable to issue concurrent certification, the FCC has agreed to coordinate its radio equipment inspections (including those of portable lifeboat radio apparatus) with inspections conducted by the Coast Guard.

NOTE: Refer to 47 CFR 80.59 for inspection requirements for FCC compulsory vessel inspections. Generally, the FCC will not attend an inspection. Instead, a licensed third-party technician will inspect the equipment and issue certification on the FCC's behalf.

b. Administration. Upon receipt of an application for renewal of a COI or issuance of a Passenger Ship Safety Certificate, the OCMI shall notify the local FCC office of the anticipated date on which the Coast Guard inspection will be completed. If inspection will be completed at that port, the FCC inspection will normally be carried out on the date indicated by the OCMI. When the Coast Guard inspection will not be completed and the vessel's COI not renewed prior to the vessel's non-international voyage on the high seas, the FCC inspection should occur at least one business day before the sailing date.

c. Issuance of Exemption Certificate. Upon completion of its inspection, the FCC will forward a copy of its Certificate of Compliance (Form 806) or a Letter of Exemption to the OCMI. The OCMI shall forward the FCC document, Form CG-969A (Notification of Approval for Passenger Ship Safety Certificate), and a copy of the vessel's current COI to Commandant (G-MOC). A SOLAS Exemption Certificate, modifying that part of the Passenger Ship Safety Certificate covering radio equipment, will be issued only upon FCC request when the vessel meets all applicable SOLAS requirements administered by the Coast Guard.

2. Cargo, Tank, and Miscellaneous Vessels

The FCC conducts annual SOLAS inspections of radio equipment (including portable lifeboat radio equipment) aboard these vessels. These normally occur in conjunction with the Coast Guard inspection for certification or the mandatory annual survey.

F. ISSUANCE OF CONVENTION CERTIFICATES

1. Passenger Vessels

Upon satisfactory completion of the SOLAS inspection, the OCMI completes Form CG-969A, Notification of Approval for Passenger Ship Safety Certificate. When the master, owner, or agent submits a written request for exemptions from SOLAS inspection requirements, the OCMI shall list recommended exemptions (if any) on the reverse side of Form CG-969A, and shall verify that the vessel has a valid Load Line Certificate. Copies of FCC Form 806 (or the Exemption Letter) and the vessel's COI are forwarded to Commandant (G-MOC) with Form CG-969A

2. Cargo, Tank, and Miscellaneous Vessels

Safety Equipment Certificates

a. Safety Equipment Certificates. Upon satisfactory completion of the SOLAS inspection, the OCMI issues the vessel a Cargo Ship Safety Equipment Certificate, its Attachment, and (if the vessel is a tanker) its Supplement. The vessel must have the certificate aboard prior to sailing on an international voyage. This certificate shall have a period of validity of 2 years, to expire on the same date as the vessel's COI.

Safety Construction Certificates

b. Safety Construction Certificates. Upon satisfactory completion of a SOLAS inspection requested by a vessel owner/operator, the OCMI shall also issue a Cargo Ship Safety Construction Certificate and Attachment. If the vessel is a tanker, the OCMI shall also issue a certificate Supplement if the vessel owner has requested it on the application for inspection. As with the Safety Equipment Certificate, this document must be aboard the vessel prior to its sailing on an international voyage; however, its period of validity is 5 years. Tankers over 10 years of age must undergo an intermediate survey, including drydocking, at the midpoint of this certificate's validity. Drydock requirements should be maintained consistent with those of the regulatory requirements.

ABS Issuance of the Safety Construction Certificate

c. ABS Issuance of the Safety Construction Certificate. The OCMI should note that an ABS issued Safety Construction Certificate has a 5-year period of validity, as allowed in the Convention.

Exemption Requests

d. Exemption Requests. When exemptions from the provisions of SOLAS requirements are requested, the OCMI shall forward recommendations to Commandant (G-MOC). Issuance of SOLAS certificates shall be delayed until the Commandant has issued an Exemption Certificate or the vessel has attained compliance with the SOLAS requirements.

3. Special Requirements for Ships Carrying Dangerous Goods

COI Endorsement in lieu of Separate SOLAS Documentation

a. COI Endorsement in lieu of Separate SOLAS Documentation. SOLAS, Regulation II-2/54.3 requires the flag administration to provide a vessel with appropriate documentation as evidence of compliance with the construction and equipment requirements for ship types and cargo spaces carrying dangerous goods. Currently, U.S. ships complying with SOLAS Regulation 54 do not receive separate documentation other than the COI. Therefore, the following guidance is provided.

NOTE: The 1981 Amendments to SOLAS extended the applicability of Regulation 54 to cargo ships of less than 500 gross tonnage constructed on or after 01 February 1992 (See Reg. 54.1.1).

(1) For existing ships, SOLAS requirements are applied depending upon the date of keel laying. The 1981 amendments, which included the revised text of SOLAS II-2, Regulation 54, went into effect on September 1, 1984. Vessels built before that date do not need to be brought into compliance with the amendments unless they undergo repairs, alterations, or modifications of a major character as defined in SOLAS, Chapter II-2, Regulation 1.3. SOLAS amendments would be applied to existing vessels without SOLAS documents insofar as would be reasonable and practicable by the flag administration on a case-by-case basis. A COI endorsement is appropriate to serve as evidence of compliance with the above regulation.

(2) The endorsement should read as follows:

"Construction and equipment meet the special requirements of SOLAS 1974, as amended, Regulation II-2/54 for carrying dangerous goods (packaged hazardous materials) as set forth below:

Cargo hold numbers #,#,#, and #: Dangerous goods of IMO hazard classes X, X, X.*

Weather decks: Dangerous goods of International Maritime Organization (IMO) hazard classes X through X, X and X.*

*The carriage of all dangerous goods, including those of IMO hazard class 7 which is not covered by SOLAS II-2/54, must be in accordance with the provisions and limitations of the current edition of the International Maritime Dangerous Goods (IMDG) Code for the specific dangerous goods."

(3) With regard to the endorsement above, the hazard classes which the vessel is suitable to carry in the cargo holds will have to be determined by the Officer in Charge, Marine Inspection (OCMI) based on determination of compliance with Regulation 54.

G. EXTENSION OF SOLAS CERTIFICATES BY CONSULAR OFFICERS

Regulation 14 of Chapter I, SOLAS 74/78 provides for extensions of Convention certificates by authorized officers of the country of registry, if the vessel is not in a port of that country when the certificate expires. This extension is granted only to permit a voyage to the country of registry or to another port where SOLAS inspections may be conducted, in cases where it appears reasonable to do so.

> **NOTE:** If the Safety Construction Certificate is issued for a 5-year period, no extension is permitted.

The procedure for extending SOLAS certificates for U.S. vessels is stated in the Department of State's Foreign Affairs Manual, Volume 7 (Special Consular Services), as follows:

> "524.6-3. Extension or Reissue of Certificates. When an international certificate issued under the terms of the International Convention for the Safety of Life at Sea to a vessel of the United States expires before or at the time the vessel reaches a foreign port or will expire before the vessel reaches a port of the United States, it may be extended by the consular officer, or a new certificate may be issued by authorities of a foreign government which is a party to the Convention, according to the preference of the master. The request must come from the master. A request of preference expressed by the agent of a United States vessel should not be honored unless the agent is acting at the master's specific request."

H. SOLAS ANNUAL SURVEY REQUIREMENTS

At a minimum, the scope of annual reinspections should satisfy all SOLAS survey requirements. The following summary of SOLAS survey requirements is adapted from IMO Resolution A.413(XI):

1. Requirements Regulation 6(b), Chapter 1 of the 1978 SOLAS Protocol requires annual surveys of all cargo and tank vessels issued SAFCON and SEC Certificates. There are additional requirements for tank vessels over 10 years old.

2. Purpose The purpose of mandatory surveys is to ensure that the ship and its equipment as prescribed in Regulations 8(a) and 10(b) of Chapter 1 of the 1978 SOLAS Protocol relating to SOLAS 1974, have been maintained in accordance with Regulation 11 of Chapter 1 of the 1978 SOLAS Protocol, and that the ship and its equipment remain satisfactory for the service intended. Annual inspections enable the Coast Guard to verify this. It is recognized that these survey provisions are not necessarily applicable to all types and sizes of ships.

3. When Required A midperiod inspection should be held within 3 months before or after the anniversary dates of the SAFCON Certificate.

4. Scope The scope of the annual inspection should depend upon the condition of the ship and its equipment.

a. In general, the inspection should consist of a certificate examination, a visual examination to confirm that no unapproved modifications have been made to the ship and its equipment, and examination and testing of vessel equipment to confirm that their condition is being properly maintained.

b. The inspection should include examination of the following:

INSPECTION ITEM	INSPECTION ITEM
• Certificate and logbook	• Firefighting equipment
• Hull and watertight integrity	• Navigational equipment
• Machinery and electrical	• Tanker requirements
• Lifesaving equipment	• Tanker over 10 years

c. Further examination and testing should be conducted as considered necessary if there is any doubt as to the condition of the vessel or maintenance of its equipment.

5. Certificate and Logbook Examination

This is required to ensure that certificates are valid and required entries are being made in logbooks.

a. Certificates to be checked are:

(1) All safety certificates issued in conformity with Regulation 12, Chapter 1, SOLAS 1974 and Regulation 14, Chapter 1, 1978 SOLAS Protocol;

(2) International Load Line Certificate; and

(3) Certificates issued by a classification society on behalf of the Coast Guard.

b. Lifesaving equipment records and logbook entries should be examined to:

(1) Confirm that any new equipment has been properly approved before installation, and that no changes have been made which would affect the validity of the SEC;

(2) Check that all instructions and/or notices including the emergency station muster list are properly posted and printed in a language understood by all personnel on board; and

(3) Check whether any fire has occurred on board since the last inspection, necessitating the operation of the fixed fire extinguishing systems or the portable fire extinguishers.

c. Hull machinery and equipment certificates and records should be checked for the required examinations of:

(1) Automatic and remote control systems, such as main propulsion automatic systems; and

(2) Inert gas systems (IGS).

d. Logbook entries should be checked for required entries. These include:

(1) Entries required by Regulation 26, Chapter III, SOLAS 1974, such as:

(a) The date of the last full muster of crew for boat and fire drill;

(b) The records indicating that lifeboat equipment was examined and found to be complete; and

(c) The last occasion the lifeboats were swung out, and which ones were lowered into the water.

(2) Entries required by Regulation 19-2(f), Chapter V, of the 1978 SOLAS Protocol.

6. Hull

A general examination of the hull and its closing appliances is required at annual inspections. This includes:

a. All closing appliances, scuppers and sanitary discharges, and means for protection of the crew according to the requirements of the 1966 Load Line Convention.

b. Examination of anchoring and mooring equipment, as far as practicable.

c. Examination and testing (locally and remotely) of all watertight doors in watertight bulkheads, as far as practicable.

d. Examination of watertight bulkhead penetrations, as far as practicable.

e. Confirmation that no significant changes have been made to the arrangement of structural fire protection.

f. Confirmation of the operation of manual and/or automatic fire doors where fitted.

7. Machinery and Electrical

A general examination of machinery and boiler spaces with particular attention to the propulsion system, auxiliary machinery, and the fire and explosion hazards is required at annual inspections. This includes:

a. Confirmation that escape routes are not blocked;

b. Examination and testing in operation of all main and auxiliary steering arrangements, including their associated equipment and systems;

c. Testing of all the means of communication between the navigating bridge and the machinery control positions, as well as the bridge and the alternative steering position, if fitted;

d. Examination, as far as practicable, of the bilge pumping systems and bilge wells including operation of pumps, remote reach rods and level alarms, where fitted;

e. External examination of boilers, pressure vessels and their appurtenances including safety devices, foundations, controls, relieving gear, high pressure and steam escape piping, insulation, and gauges;

f. Visual and operational examination, as far as feasible, of electrical machinery, emergency sources of power, switchgear, and other electrical equipment; and

g. Confirmation, as far as practicable, of the operation of all emergency sources of power and, if they are automatic, in the automatic mode.

8. Lifesaving Equipment

Inspection of the lifesaving gear and equipment shall include:

a. Examination of all lifeboats, davits, embarkation arrangements, and launching gear. If practicable, one of the lifeboats should be lowered to the water.

b. Testing that the engine of each motor lifeboat starts satisfactorily, in both ahead and astern operation (as permitted by cargo handling conditions).

c. Checking that the inflatable life rafts have been serviced during the past 12 months, unless it is determined that the servicing has not been possible; checking that stowage will facilitate proper release and that launching instructions are posted. The embarkation arrangement of inflatable life rafts shall also be examined and, when provided, the launching arrangement of davit launched life rafts.

d. Checking that lifeboats are in good condition, and that the required number are fitted with self-igniting lights and self-activating smoke signals, and that all are properly stationed.

e. Checking that rigid life rafts are in good condition and that stowage will facilitate rapid launching.

f. Checking for proper stowage of life jackets and random examination of their condition.

g. Checking that ship and lifeboat distress signals and the line-throwing rockets are not out of date.

h. Testing of the emergency lighting and general alarm system.

9. Firefighting Equipment

Annual inspections of firefighting equipment shall include:

a. Confirmation that fire control plans are properly posted;

b. Examination and testing, as feasible, of the fire and/or smoke detection system(s);

c. Examination of the fire main system and confirmation that each fire pump, including the emergency fire pump, can be operated so that the two required powerful jets of water can be produced simultaneously from different hydrants;

d. Confirmation that fire hoses, nozzles, applicators and spanners are in good working condition and situated at their respective locations;

e. Examination of fixed firefighting system controls, piping, instructions and marking, checking for evidence of proper maintenance and servicing, including date of last systems tests;

f. Confirmation that all semi-portable and portable fire extinguishers are in their stowed positions, checking for evidence of proper maintenance and servicing, conducting random check for evidence of discharged containers;

g. Confirmation, as far as practicable, that the remote controls for stopping fans and machinery and shutting off fuel supplies in machinery spaces are in working order;

h. Examination of the closing arrangements of ventilators, funnel annular spaces, skylights, doorways and tunnels, where applicable; and

i. Confirmation that the firemen's outfits are complete and in good condition.

10. Navigational Equipment

Annual inspections of navigational equipment shall include verifying that:

a. Navigation lights, shapes, and sound signaling equipment are in order;

b. The compass deviation record book is properly maintained and that the daylight signaling lamp is in order;

c. The radars, echo depth-sounding device, automatic radar plotting aid (ARPA), and gyro-compass are in working order;

d. Pilot ladder/hoists are in good condition and operational; and

e. Nautical charts and publications necessary for the intended voyage are available and updated.

11. Tankers

These vessels are subject to additional inspection requirements. The following areas and equipment shall be examined:

a. Weather Deck and Equipment.

(1) Cargo tank openings, such as gaskets, covers, coamings, and screens;

(2) Pressure/vacuum valves and flame screens on cargo tanks;

(3) Flame screens on vents to all bunker, oily ballast and oily slop tanks and void spaces, as far as practicable;

(4) Cargo, crude oil washing bunker, ballast and vent piping systems, including vent masts and headers; and

(5) Confirmation that all electrical equipment in dangerous zones is in good condition and has been properly maintained.

b. Cargo Pumprooms.

(1) Confirmation that potential sources of ignition in or near the cargo pumproom are eliminated, such as loose gear, excessive product in bilges, excessive vapors, combustible materials, etc., and that access ladders are in good condition.

(2) Confirmation that all electrical equipment is in good condition and has been properly maintained.

(3) Examination of all pumproom bulkheads for signs of oil leakage or fractures and, in particular, the sealing arrangements of all penetrations of pumproom bulkheads.

(4) Examination of the condition of all piping systems.

(5) Examination, as far as practicable, of cargo, bilge, ballast, and stripping pumps for excessive gland seal leakage; verification of proper operation of electrical and mechanical remote operating and shutdown devices, and pumproom bilge system, and that pump foundations are intact.

(6) Confirmation that the pumproom ventilation system is operational, ducting intact, dampers operational, and screens are clean.

(7) Verification that installed pressure gauges on cargo discharge lines and level indicator systems are operational.

c. IGS Inspections.

(1) External examination of the condition of all piping and components for signs of corrosion or gas/effluent leakage;

(2) Confirmation of the proper operation of both inert gas blowers;

(3) Observation of the operation of the scrubber room ventilation system;

(4) Checking of deck water seal for automatic filling and draining, for presence of water carry-over, and checking the condition of the non-return valve;

(5) Examination of the operation of all remotely operated or automatically controlled valves and, in particular, the flue gas isolating valve(s);

(6) Observation of a test of the interlocking feature of soot blowers;

(7) Observation that the gas pressure regulating valve automatically closes when the inert gas blowers are secured; and

(8) Checking, as far as practicable, the following alarms and safety devices of the IGS, using simulated conditions where necessary:

(a) High oxygen content of gas in the inert gas main;

(b) Low gas pressure in the inert gas main;

(c) Low pressure in the supply to the deck water seal;

(d) High temperature of gas in the inert gas main;

(e) Low water pressure to the scrubber; and

(f) Accuracy of portable and fixed oxygen measuring equipment by means of calibration gas.

d. Other Items.

(1) External examination of piping and cutout valves of cargo tank and cargo pumproom fixed firefighting system.

(2) Confirmation that the deck foam system and deck sprinkler system are in sound operating condition.

12. Requirements or Tankers Over Ten Years Old

General

a. General. Regulation 10(a)(ii), Chapter 1 of the 1978 SOLAS Protocol, contains additional inspection requirements at intermediate inspections for tankers over ten years old. "A tanker of ten years of age and over shall undergo a minimum of one intermediate survey during the period of validity of its SAFCON. In cases where only one such intermediate survey is carried out in any one certificate validity period, it shall be held not before 6 months prior to, nor later than 6 months after, the halfway date of the certificate's period of validity."

Scope

b. Scope. The intermediate survey should be a thorough examination and be sufficiently extensive to enable the Administration to attest that the ship's degree of compliance with SAFCON warrants the ship's continued possession of the certificate and, further, that the ship can continue to be operated with safety. The intermediate survey of hull, machinery, and equipment of tankers of 10 years of age and over should consist of all the relevant items for all vessels and, at a minimum, the following additional items:

(1) Hull.

(a) Examination of the shell, including bottom and bow plating, keel, stem, stern frame, and rudder.

(b) Note the clearances measured in the rudder bearings.

(c) Examination of the propeller and shaft seals, as far as practicable.

(d) Note the clearance measured in the propeller shaft(s).

(e) Examination of the sea connections and overboard discharge valves and their connections to the hull.

(f) Examination of anchoring and mooring equipment as far as practicable. The anchors should be partially lowered and raised using the windlass.

(g) Examination of at least two selected cargo tanks internally.

(h) Examination of cargo, crude oil washing, bunker, ballast, steam, and vent piping, as well as vent masts and headers. If upon examination there is any doubt as to the condition of the piping, it may be required to be pressure tested, gauged, or both. Particular attention is to be paid to any repairs, such as welded doublers.

(2) Machinery and Electrical.

(a) General examination of machinery and boiler spaces, including tank tops, bilges and cofferdams, sea suctions and overboards, with particular attention to the propulsion system and fire and explosion hazards; confirmation that emergency escape routes are not blocked.

(b) Ascertain that the annual examinations of boilers and other pressure vessels have been carried out as required, and that safety devices, such as for boilers, have been tested.

(c) General examination of the electrical equipment and cables in dangerous zones, such as cargo pump rooms and areas adjacent to cargo tanks, for defective explosion proof lights and fixtures, improperly installed wiring, non-approved lighting and fixtures and dead ended wiring, and testing the insulation resistance of the circuits. Except in cases where a proper record of testing is maintained, consideration should be given to accepting recent readings by the crew. If any of the readings are marginal, or if the condition of the cables, fixtures, or equipment appears defective in any way, verification measurements may be required. These measurements should not be attempted until the ship is in a gas-free or inerted condition and should be carried out within an acceptable time period.

13. Completion of SOLAS Annual Inspection

a. After satisfactory completion of the survey, the endorsement (See MSM II, A.3) to the SAFCON and/or to the SEC should be completed by the OCMI or his or her authorized representative. When the SAFCON has been issued by the American Bureau of Shipping (ABS), they should provide the SAFCON supplements and endorsements as necessary.

b. If a survey shows that the condition of the ship or its equipment is unsatisfactory, the OCMI should be guided by the requirements of Regulation 6(d), Chapter 1, of the 1978 SOLAS Protocol.

I. SMALL PASSENGER VESSELS SUBJECT TO SOLAS 74/78

1. Drydockings T-boats holding SOLAS certificates must have a drydock examination at least once every 12 months.

2. Lifeboatage Chapter III of SOLAS 74/78 requires 100-percent lifeboatage, provided that an administration may permit exemptions according to the route and service. T-boats operating on international ocean or coastwise routes may be exempted from this requirement, provided they are equipped with inflatable life rafts sufficient for all persons aboard. T-boats operating on lesser routes may utilize lifefloats or buoyant apparatus capable of accommodating all persons aboard. In all cases, a suitable rescue boat shall be provided unless the OCMI deems this unnecessary.

3. Number of Passengers

a. 150 Passengers or Less. Except as noted below, T-boats carrying 150 passengers or less that comply with the requirements for a COI will generally be considered satisfactory for international voyages, provided the routes of operation are so limited as to permit exemption under Regulations 1(c) of Chapter II-1, 1(e) of Chapter II-2, and 3(a) of Chapter III, SOLAS 74/78.

b. More Than 150 Passengers. Subchapter K passenger vessels on international voyages shall comply with the provisions of Chapter II-2, SOLAS 74/78. Accordingly, no major exemptions that would reduce the overall safety afforded new vessels constructed under SOLAS should be granted.

c. T-boats Having Overnight Accommodations for 50 or More Passengers. Such vessels must, in the OCMI's judgment, reasonably comply with the structural fire protection requirements of SOLAS 74/78 before an exemption will be granted. When exemptions are requested for such vessels, due consideration shall be given to vessel size, route, condition; on, etc.

4. Certificates

a. General. COIs shall be issued for 1 year to correspond with the Passenger Ship Safety Certificate. The initial Passenger Ship Safety Certificate (and Exemption Certificate, when appropriate) will be issued annually by Commandant (G-MOC) upon receipt of Form CG-969A (Notification of Approval for Passenger Ship Safety Certificate), a copy of FCC Form 806 (or Exemption Certificate), and a copy of the current COI (See E2.F above). An Exemption Certificate will not be issued unless the vessel has been inspected by the Coast Guard and found to qualify for the safety certificate. It is stressed that T-boats may not operate on international voyages without the required SOLAS safety and exemption certificates. COIs should be withdrawn if necessary to obtain compliance with SOLAS requirements.

b. Specification of Route. The routes specified on the COI and Passenger Ship Safety Certificate (and Exemption Certificate, if issued) must agree. If the owner requests a route specification on the FCC certificate that differs from the route indicated on the COI, the safety and exemption certificates will be held by Commandant (G-MOC) until the matter is resolved.

J. SPECIAL CONSIDERATIONS

1. Introduction Regulation 5 of Chapter I, SOLAS 74/78 provides for the substitution of equivalent fittings, appliances, or arrangements when the vessel's administration is satisfied that the substitute is as effective as the item specified in the Convention. Unless otherwise provided, Chapters II-1, II-2, and III of SOLAS 74 apply to new vessels. Special provision is made for existing vessels. Generally, they are expected to meet requirements for construction, lifesaving appliances, etc., that are considered reasonable and practicable by the vessel's administration.

2. Equivalents Filed with IMO

a. Cargo Vessels of 500-l600 GT, Except Tankers. Regulation 35 of Chapter III, SOLAS 74/78 provides that every cargo vessel, with certain exceptions, shall carry lifeboats on each side of the ship sufficient to accommodate all persons aboard and life rafts sufficient to accommodate half the number of all persons aboard. The U.S. has accepted an equivalent arrangement under the provisions of Regulation 5 of Chapter I, SOLAS 74/78. Cargo vessels of 500-1600 GT, except tankers, may be equipped with the following:

(1) On each side of the vessel, one or more davit-launched inflatable life rafts sufficient to accommodate all persons aboard;

(2) A minimum of one launching device on each side of the vessel, operation of which shall not require anyone to remain aboard;

(3) Sufficient float-free inflatable life rafts to accommodate not less than one-half of all persons aboard;

(4) For a vessel aboard which persons need not board inflatable life rafts in the water nor descend to them a distance greater than 3 m (9 ft), float-free inflatable life rafts on each side of the vessel sufficient to accommodate all persons aboard, may be substituted for davit-launched rafts and launching equipment; and

(5) A motor-propelled rescue boat suitable for ocean service, with a davit or other suitable launching gear capable of launch by no more than three persons.

NOTE: In accepting this arrangement, the Commandant has considered experience gained on vessels not subject to SOLAS 74/78 and the results of sea trials conducted on offshore supply vessels (OSVs) subject to SOLAS.

b. T-Boats Operating on Routes Between Florida and the Bahamas. Under Regulation 5 of Chapter I, the U.S. has accepted the provisions of 46 CFR, Subchapter T as equivalent to SOLAS provisions for small passenger vessels operating on routes between the east coast of Florida and the Bahamas not more than 30 nautical miles from land, provided they are:

NOTE: In accepting these provisions, the U.S. has taken into account the proven reliability of vessels constructed according to the requirements of Subchapter T, the sheltered nature of the area, and available search and rescue resources.

(1) Of less than 100 GT;

(2) Carrying less than 50 passengers;

(3) Certificated by the Coast Guard for a 100-nautical mile (180 kilometers) ocean route;

(4) Equipped with inflatable life rafts for all persons aboard;

(5) Equipped with a LORAN C set and a fathometer; and

(6) Equipped with two fixed bilge pumps, which may be combination bilge/fire pumps.

K. INSPECTION FOR MANNING REQUIREMENT EXEMPTION FOR VESSELS WITH GMDSS

In 1988, the international maritime community agreed to replace the radiotelegraph as the required installation with the Global Distress & Safety System (GMDSS), an automated ship shore distress and safety radio communications system that relies on satellites and advanced terrestrial systems. Accordingly, the Federal Communications Commission (FCC) adopted rules implementing the international GMDSS requirements in 47 CFR 80 for U.S. vessels in 1992. Section 206 of the Telecommunications Act of 1996 eliminated the radiotelegraph carriage requirements for each GMDSS-equipped vessel. This includes removing the Radio Officer from a vessel's required manning, so long as the U.S. Coast Guard determines that the vessel has the GMDSS equipment installed and in good working condition.

1. Definitions

Cargo Ship Safety Radio Certificate

a. Cargo Ship Safety Radio Certificate: a certificate issued after inspection of a cargo ship radio communications equipment which complies with applicable Safety Convention radio requirements.

Cargo Ship

b. Cargo Ship: is defined as any ship that is not a passenger ship.

Global Maritime Distress and Safety System (GMDSS)

c. Global Maritime Distress and Safety System (GMDSS): an international Maritime organization (IMO) worldwide coordinated maritime distress system designed to provide the rapid transfer of distress messages from vessels in distress to units best suited for giving or coordinating assistance. The system includes standardized equipment and operational procedures, unique identifiers for each station, and the integrated use of frequency bands and radio systems to ensure the transmission and reception of distress and safety calls and messages at short, medium and long ranges.

Maritime Sea Areas

d. Maritime Sea Areas: for the purposes of GMDSS requirements, a ship's area of operations is defined as follows:

(1) Sea Area A1: an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available as defined by the International Maritime Organization (IMO).

(2) Sea Area A2: an area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available as defined by IMO.

(3) Sea Area A3: an area, excluding sea areas A1 and A2, within the coverage of an INMARSAT geo-stationary satellite in which continuous alerting is available.

(4) Sea area A4: an area outside sea areas A1, A2, and A3.

(5) Maritime sea areas are delineated in the international Maritime Organization Publication GMDSS Master Plan of Shore-Based Facilities (GMDSS Circ.7).

Passenger Ship

e. Passenger Ship: any ship that carries or is licensed or certificated to carry more than twelve passengers.

Passenger Ship Safety Certificate

f. Passenger Ship Safety Certificate: a certificate issued by the Commandant of the Coast Guard after inspection of a passenger ship which complies with the requirements of the Safety Convention; including radio communications equipment.

2. Applicability

This policy applies to each U.S. passenger ship and each U.S. Cargo Ship of 1,600 gross tons and upward.

3. GMDSS Compliance Determination

The OCMI shall check that a vessel meets the following requirements to make a determination whether a vessel has the required GMDSS equipment installed and in good working condition.

Cargo Ship Safety Radio Certificate

a. A vessel must carry a valid Cargo Ship Safety Radio Certificate or Passenger Ship Safety Certificate. The Certificate must be posted in a prominent and accessible place on the ship.

GMDSS Radio Operators

b. GMDSS Radio Operators. A vessel must carry at least two persons holding GMDSS Radio Operator's Certificates as specified in 47 CFR 13.2 for distress and safety radio communications purposes, one of whom has to be designated as the primary operator during an emergency.

Maintenance Requirements

c. Maintenance Requirements. Required GMDSS radio equipment must be maintained to provide the availability of the functional requirements and performance standards specified in 47 CFR 80. The ship's maintenance program should make explicit reference to GMDSS equipment to ensure on-board or shore8ide plans are taken into account.

(1) On ships engaged on voyages in sea areas Al and A2, the availability of functioning GMDSS equipment must be ensured by duplication of equipment, shore-based maintenance, or at-sea electronic maintenance capability, or any combination of these.

(2) On ships engaged on voyages in sea areas A3 and A4, the availability of functioning equipment must be ensured by using a combination of at least two of the following methods:

- duplication of equipment,
- shore-based maintenance, or
- at-sea electronic maintenance capability.

(3) Maintenance Methods. The OCMI shall check the following for determining adequacy of the maintenance methods specified above.

(a) Duplication of Equipment. If duplication of Equipment is used, the vessel must meet the requirements in 47 CFR 80.1105(g).

(b) Shore-Based Maintenance. Demonstration of shore-based maintenance should be provided in the form of a contract or other agreement between the vessel and a shore-based electronics maintenance company. The Ships master is responsible for providing sufficient information to satisfy the OCMI. Means for enforcing this requirement are still being developed and are subject to change.

(c) At-Sea Electronic Maintenance Capability. A vessel using this method must carry at least one qualified GMDSS Radio Maintainer. GMDSS Radio Maintainer must hold one of the following licenses:

(i) FCC GMDSS Radio Maintainer's License.

(ii) Merchant Mariner’s Document (MMD).

(iii) Appropriately endorsed STCW certificate

Scope of Inspection

d. Scope of Inspection. The Federal Communications Commission will determine that a vessel has GMDSS equipment installed and in good working condition. The inspection conducted by the Coast Guard to make a determination that a vessel meets the exemption requirements will include, at a minimum, the documentation check specified above in MSM II, E2.F.3 (a) through (c). The OCMI may also check entries in the Radiotelephone Log to ensure GMDSS equipment has been tested demonstrating it to be capable of meeting all distress and safety functions prior to the ship departing each port, as required by 47 CFR 80.1105(e) and 80.409(e) and may ask the master how these tests are performed. The OCMI may also ask that the GMDSS operator to demonstrate an ability to communicate over at least two GMDSS systems, show that the NAVTEX and Inmarsat SafetyNET receivers are working, or show the EPIRB built-in test works. If the OCMI has any doubts or concerns about the technical adequacy of the GMDSS equipment installation, the suitability of electrical wiring to interconnect components of the equipment, or the proper maintenance and efficient operation of the GMDSS equipment, they should consult with the local FCC representative before taking further action.

4. Documentation

Once the OCMI has checked for compliance with the requirements specified above and made the determination that a vessel's GMDSS equipment is installed and in good working condition, the Radio Officer shall be removed from the required manning and the vessel's COI endorsed with the following:

> "This vessel is equipped with GMDSS and shall be provided with a minimum of two persons who possess certificates issued to them from the Federal Communications Commission attesting to their qualification in the operation of GMDSS, and it the at sea maintenance method is chosen, at least one person possessing a certificate issued to them from the Federal Communications Commission attesting to their qualification in the maintaining of GMDSS."

L. EXEMPTION REQUESTS FROM RDF CARRIAGE REQUIREMENTS

SOLAS 74 requires all vessels 1600 GT or greater, engaged on international voyages, to be fitted with a radio direction-finding (RDF) equipment. The OCMI/COTP may grant an exemption from this requirement to those U.S. ships that fully comply with the GMDSS requirements contained in 47 CFR Subpart W and have an operable GPS receiver installed.

1. Review for Exemption

Upon receipt of a request for an exemption from the RDF carriage requirements in SOLAS 74, the OCMI will check to ensure that the ship fully complies with the following requirements:

Compliance with GMDSS

a. Compliance with GMDSS. The ship must be in full compliance with GMDSS requirements. A ship is considered in compliance with GMDSS requirements if it meets the criteria found in MSM II, E2.K.

GPS Carriage

b. GPS Carriage. The ship must have an operable GPS receiver installed.

2. Issuance of Exemption

If the OCMI/COTP finds that a ship meets the requirements, an Exemption Certificate will be issued granting the exemption. Once issued, the Exemption Certificate shall be attached to the applicable Safety Certificate (either the Cargo Ship Safety Equipment Certificate or Passenger Ship Safety Certificate). Figures E2-L1 and L2 provides an example of a completed Exemption Certificate. The following information will be filled on the Exemption
Certificate:

a. The authority for this exemption is regulation V/1-2(p).

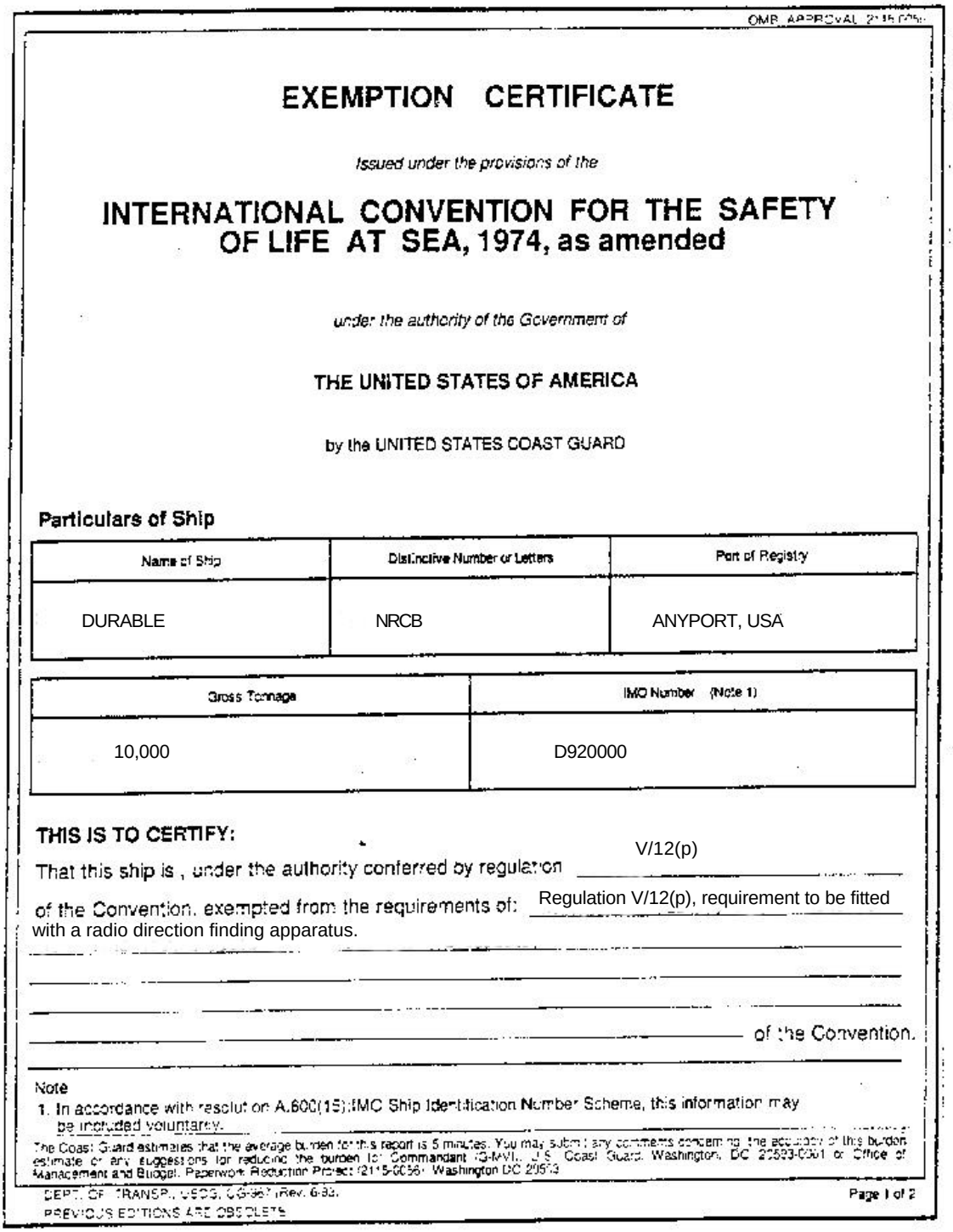
b. The requirement that the ship is exempted from is regulation V/12(p).

c. The condition on which the Exemption Certificate is granted is:

> "This ship must comply with the GMDSS requirements found in Title 47, Code of Federal Regulations, Sub-part W."

d. The Exemption Certificate will be valid until the Safety Certificate to which it is attached expires.

> **NOTE:** More information on sea areas and GMDSS, including the FCC rules, may be obtained from the Office of Communications Systems, Spectrum Management Division (G-SCT-2) at (202) 267-2860, email: cgsoms@comdt.uscg.mil, or on the internet at http://www.navcen.uscg.mil/marcomms/gmdss/gmdss.htm



OMB APPROVAL 2115-0056

EXEMPTION CERTIFICATE

Issued under the provisions of the

INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, as amended

under the authority of the Government of

THE UNITED STATES OF AMERICA

by the UNITED STATES COAST GUARD

Particulars of Ship

Name of Ship	Distinctive Number or Letters	Port of Registry
DURABLE	NRCB	ANYPORT, USA

Gross Tonnage	IMO Number (Note 1)
10,000	D920000

THIS IS TO CERTIFY:

That this ship is , under the authority conferred by regulation V/12(p)

of the Convention, exempted from the requirements of: Regulation V/12(p), requirement to be fitted with a radio direction finding apparatus.

of the Convention.

Note

1. In accordance with resolution A.600(15) IMO Ship Identification Number Scheme, this information may be included voluntarily.

The Coast Guard estimates that the average burden for this report is 5 minutes. You may submit any comments concerning the accuracy of this burden estimate or any suggestions for reducing the burden to: Commandant (G-MVI), U.S. Coast Guard, Washington, DC 20593-0001 or Office of Management and Budget, Paperwork Reduction Project (2115-0056), Washington DC 20503

DEPT. OF TRANSP., USCG, CG-867 (Rev. 6-93).

PREVIOUS EDITIONS ARE OBSOLETE

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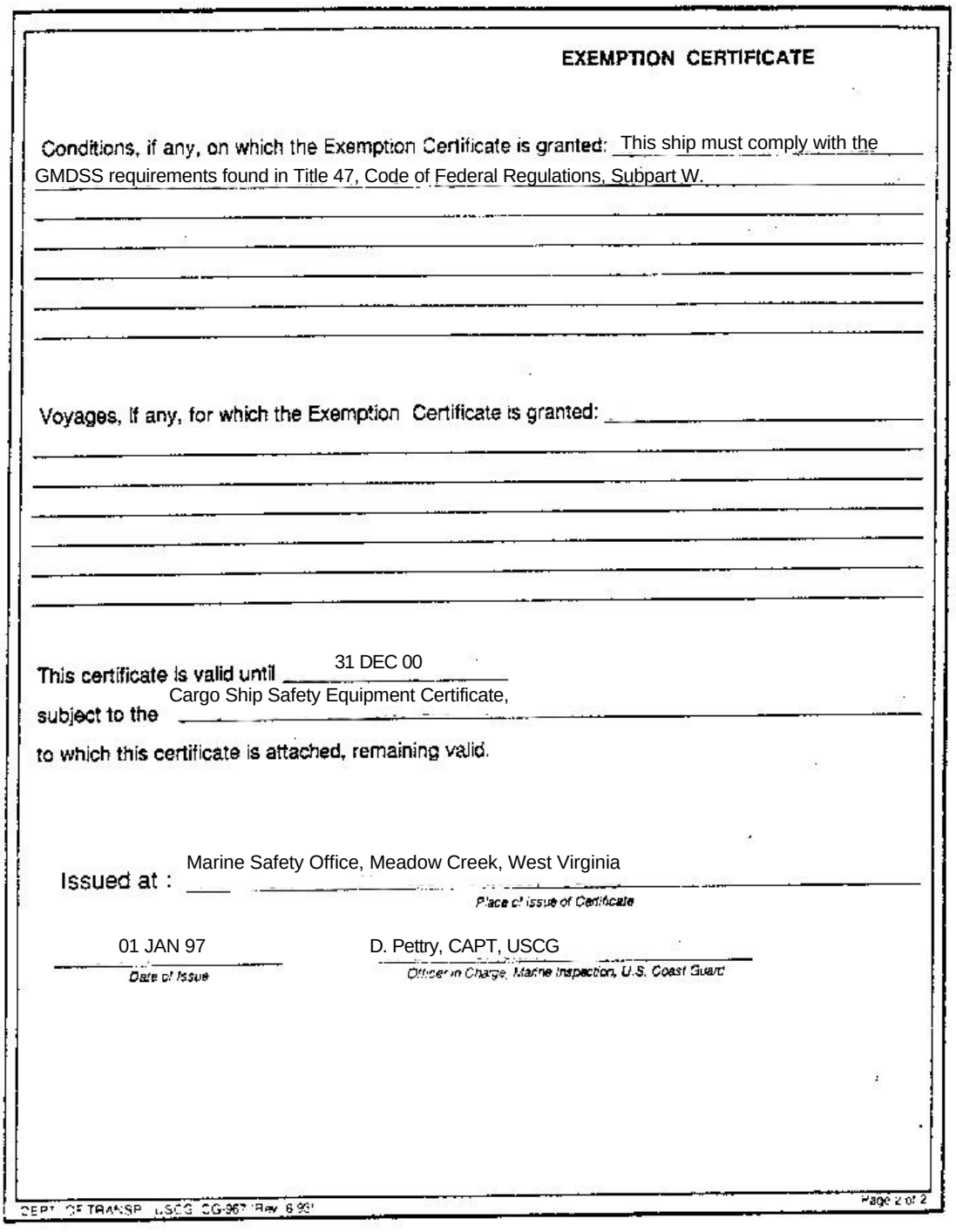
Figure E2.L.-1: SOLAS Exemption Certificate for GMDSS (front page)



EXEMPTION CERTIFICATE

Conditions, if any, on which the Exemption Certificate is granted: This ship must comply with the GMDSS requirements found in Title 47, Code of Federal Regulations, Subpart W.

Voyages, if any, for which the Exemption Certificate is granted: _____

This certificate is valid until 31 DEC 00

subject to the Cargo Ship Safety Equipment Certificate,

to which this certificate is attached, remaining valid.

Issued at : Marine Safety Office, Meadow Creek, West Virginia

Place of issue of Certificate

01 JAN 97

Date of Issue

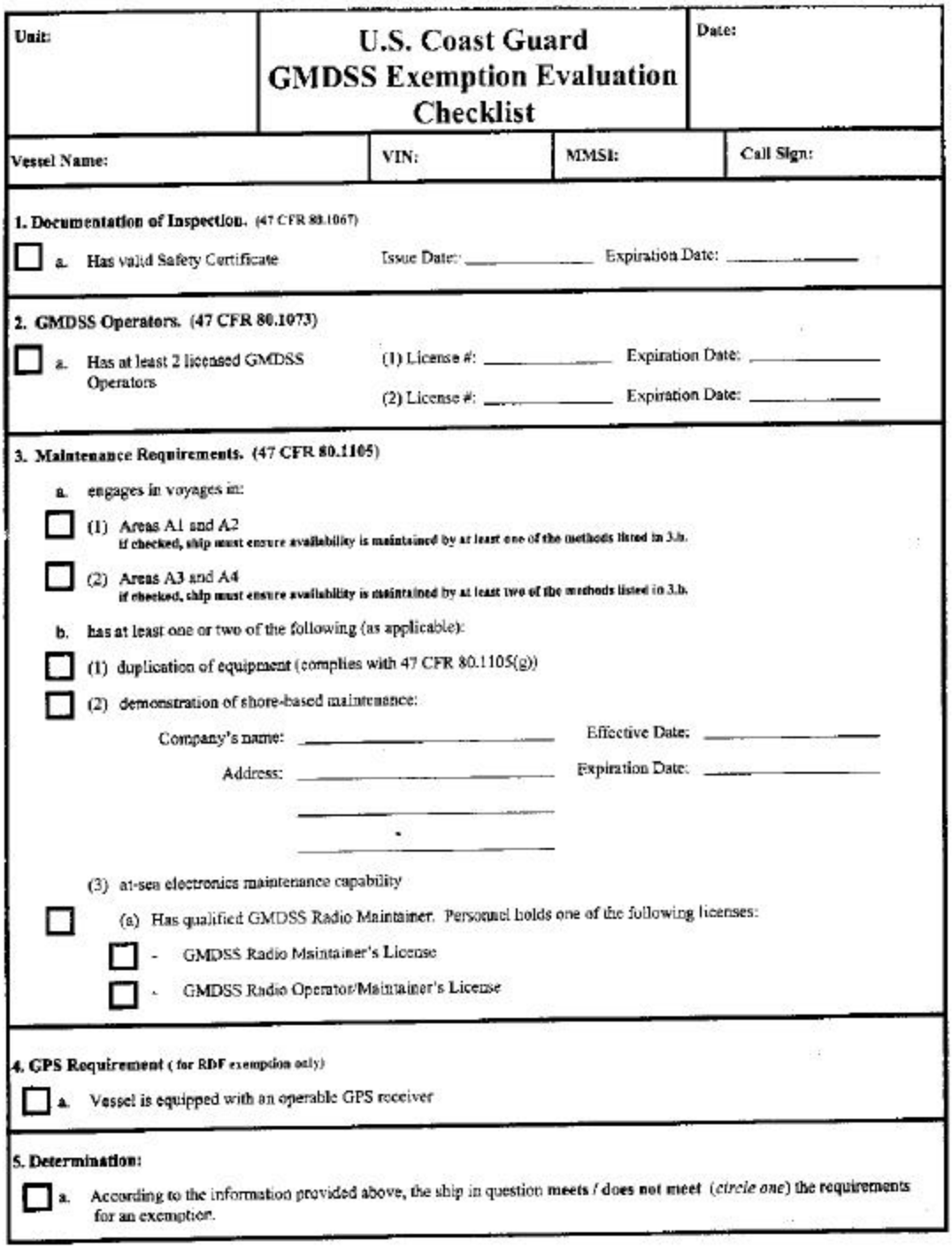
D. Pettry, CAPT, USCG

Officer in Charge, Marine Inspection, U.S. Coast Guard

DEPT. OF TRANSP. USCG CG-967 Rev. 6-93

Page 2 of 2

Figure 9.L.-1: SOLAS Exemption Certificate for GMDSS (back page)



Unit:	U.S. Coast Guard GMDSS Exemption Evaluation Checklist	Date:

Vessel Name:	VIN:	MMSI:	Call Sign:

1. Documentation of Inspection. (47 CFR 80.1067)

☐ a. Has valid Safety Certificate — Issue Date: _____ Expiration Date: _____

2. GMDSS Operators. (47 CFR 80.1073)

☐ a. Has at least 2 licensed GMDSS Operators — (1) License #: _____ Expiration Date: _____ (2) License #: _____ Expiration Date: _____

3. Maintenance Requirements. (47 CFR 80.1105)

a. engages in voyages in:

☐ (1) Areas A1 and A2
if checked, ship must ensure availability is maintained by at least one of the methods listed in 3.b.

☐ (2) Areas A3 and A4
if checked, ship must ensure availability is maintained by at least two of the methods listed in 3.b.

b. has at least one or two of the following (as applicable):

☐ (1) duplication of equipment (complies with 47 CFR 80.1105(g))

☐ (2) demonstration of shore-based maintenance:

Company's name: _____ Effective Date: _____

Address: _____ Expiration Date: _____

_____

_____

(3) at-sea electronics maintenance capability

☐ (a) Has qualified GMDSS Radio Maintainer. Personnel holds one of the following licenses:

☐ - GMDSS Radio Maintainer's License

☐ - GMDSS Radio Operator/Maintainer's License

4. GPS Requirement (for RDF exemption only)

☐ a. Vessel is equipped with an operable GPS receiver

5. Determination:

☐ a. According to the information provided above, the ship in question **meets / does not meet** (*circle one*) the requirements for an exemption.

Figure 9.L.-2: GMDSS Exemption Evaluation Checklist

CHAPTER 3: SAFETY MANAGEMENT SYSTEMS (SMS)

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CHAPTER 3: SAFETY MANAGEMENT SYSTEMS (SMS)

A. INTRODUCTION

On October 19, 1996, the President signed into law the U.S. Coast Guard Authorization Act of 1996 (Public Law 104-324). Section 600 of this Act added Chapter 32 to Title 46 of the U.S. Code entitled "Management of Vessels." The powers of 46 U.S.C. Chapter 32 were delegated from the Secretary, Department of Transportation to the Commandant of the Coast Guard in 49 CFR §§1.46 (fff) and (ggg). Regulations to enforce these requirements were developed by the Coast Guard and made a part of 33 CFR part 96. The requirements for safety management systems are mandatory for all vessels engaged on a foreign voyage that call in U.S. ports or for all U.S. vessels engaged on a foreign voyage, and which:

- carry more than 12 passengers; or are
- 500 gross tons or more and are:
  - oil tankers;
  - chemical tankers;
  - gas carriers;
  - bulk freight vessels;
  - other freight vessels;
  - high speed craft; or
  - self-propelled mobile offshore drilling units (MODU)s.

Vessels which are on U.S. domestic routes or are engaged on foreign voyages but do not meet the above applicability may elect to receive voluntary ISM certification under this program and be certificated.

All U.S. requirements are consistent with the International Management Code for the Safe Operation of Ships and for Pollution Prevention, Chapter IX of SOLAS, short titled the "International Safety Management (ISM) Code."

1. References

- The International Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code), Chapter IX of SOLAS.
- IMO Resolution A.788(19). Guidelines on Implementation of the International Safety Management Code (ISM) by Administrations
- NVIC 4-98, Port State Control Guidelines for the Enforcement of ISM Code.
- 46 U.S.C. § 3201 et. seq.
- 33 CFR part 96 - "Rules for the Safe Operation of Vessels and Safety Management Systems."
- 46 CFR, parts 2, 31, 71, 91, 107, 115, 126, 175,176, and 189.
- U.S. Coast Guard International Safety Management Code Job Aid for Marine Inspectors
- U.S. Coast Guard International Safety Management Code Job Aid for Small Passengers Vessels.

2. What is the International Safety Management (ISM) Code?

a. On November 4, 1993, the International Maritime Organization (IMO) adopted resolution A.741(18), entitled "International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management [ISM] Code)." To further enhance the safety of ships and pollution prevention, the IMO amended the Convention for the Safety of Life at Sea (SOLAS), 1974, by adopting a new chapter, Chapter IX, Management for the safe operation of ships, making compliance with the requirements of the ISM Code mandatory. Copies of SOLAS Chapter IX and the ISM Code are provided in enclosure (2) to NVIC 4-98. Amplifying guidance on implementation of the requirements of SOLAS Chapter IX was provided by the IMO in the form of Resolution A.788(19), "Guidelines on the Implementation of the International Safety Management (ISM) Code by Administrations," which is provided in enclosure (3) to NVIC 04-98. 46 U.S.C. §3201 et. seq. required the development of U.S. regulations for U.S. vessel compliance consistent with the ISM Code.

3. Applicability

Compliance with the ISM Code (Chapter IX of SOLAS) and 33 CFR Part 96, will become mandatory on the following dates for U.S. and foreign vessels engaged on foreign voyages:

a. On or after July 1, 1998 - for vessels carrying more than 12 passengers, including passenger high speed craft; or oil tankers, chemical tankers, gas carriers, bulk carriers, and freight high speed craft of 500 gross tons or more.

b. On or after July 1, 2002 - for other freight vessels and self-propelled mobile offshore drilling units (MODU's) of 500 gross tons or more.

c. The requirements of the ISM Code are not mandatory for:

- a public vessel used for non-commercial purposes;
- a barge;
- a recreational vessel not engaged in commercial service;
- a fishing vessel; or
- a vessel operating on the Great Lakes or its tributary and connecting waters.

NOTE: For U.S. vessels, the public vessel exemption is defined in 46 U.S.C. §§2101 and 2109, and in 33 CFR §96.210(a) (5).

d. Any U.S. vessel for which it is not mandatory to meet 33 CFR Part 96 may voluntarily meet safety management system (SMS) requirements and have their SMS certificated.

4. U.S. Law vs. International Convention Definitions

To maintain consistency with other U.S. shipping laws and regulations, the terms used to describe ship types in the U.S. law and regulations differ from those used in SOLAS Chapter IX and the ISM Code. However, the difference applies only to the terminology use; it does not affect the types of ships that must comply. Table 1 provides a cross reference between ship types used in U.S. law and those used in SOLAS Chapter IX.

TABLE 1: TERMS USED IN U.S. LAW/REGULATION AND THEIR SOLAS EQUIVALENTS FOR THE ISM CODE

Term used in U.S. law/regulations	Is Equivalent To (=)	Term used in SOLAS Chapter IX
Vessel Transporting More Than 12 Passengers	→	Passenger Ship
Tanker	→	Oil Tanker, Chemical Tanker and Gas Carrier
Bulk Freight Vessel	→	Bulk Carrier
Freight Vessel	→	Cargo Ship

a. Bulk Carrier Definition: In November 1997, the SOLAS Conference on the Safety of Bulk Carriers was held at the IMO's headquarters in London. At that conference a clarification of the definition of "bulk carriers" provided in SOLAS Chapter IX, Regulation 1.6 was established. This clarification has been adopted for use by the U.S. Coast Guard in determining which ships must meet the July 1, 1998, deadline for compliance with the ISM Code. Therefore, only those ships which meet any of the following three definitions will be considered a "bulk carrier" for purposes of compliance with the ISM Code. Other vessels, which carry bulk cargos, but do not meet one of the three definitions, must meet the second effective date of the ISM Code (1 July 2002) as required by 33 CFR Subpart 96.210.

b. Typical cross sections of the types of ships listed below are provided in Figure 1.

(1) general bulk carrier - is a ship which is:

(a) constructed with a single deck;

(b) constructed with top-side tanks and hopper side tanks in cargo spaces; and

(c) intended primarily to carry dry cargo in bulk.

(2) ore carrier - is a ship which is:

(a) a single deck ship;

(b) constructed with two longitudinal bulkheads;

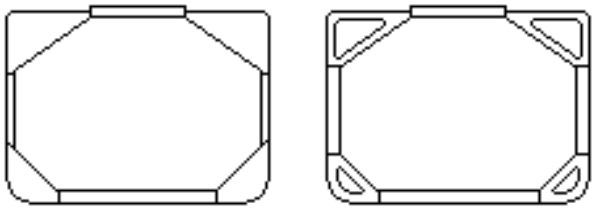
(c) constructed with a double bottom throughout the cargo region; and

(d) intended for the carriage of ore cargoes.

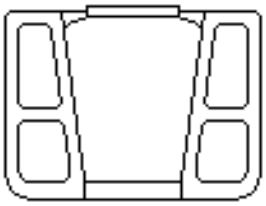
(3) combination carrier - a ship which is a tanker designed to carry oil or alternatively solid cargoes in bulk (SOLAS 74, Chapter II-2, regulation 3.27)

FIGURE 1: TYPICAL CROSS SECTIONS FOR THE THREE TYPES OF BULK CARRIERS UNDER THE ISM CODE

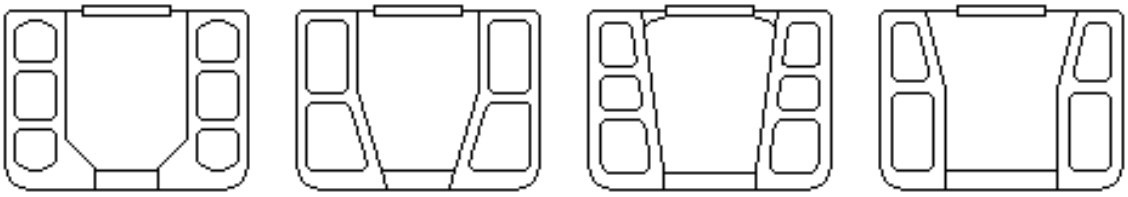
General Bulk Carrier



Ore Carrier



Combination Carrier



B. DISCUSSION

1. Objectives The objectives of the ISM Code and the regulations contained in 33 CFR Part 96, are to ensure safety at sea, prevent the occurrence of human injury or loss of life, and avoid environmental and property damage. Specifically, the ISM Code seeks to address the issues of human error and human omissions. To accomplish its objectives, the ISM Code requires companies (or their designated representatives, such as vessel managers or bareboat charterers, who have formally assumed responsibility for vessel operations) to implement the SMS both in their shoreside management and aboard their vessels.

2. Key elements Key elements of the SMS include documented company procedures establishing:

a. a company safety and environmental protection policy;

b. instructions and procedures to ensure vessels are operated in accordance with relevant flag State and international regulations;

c. defined levels of authority and lines of communication between, and among shore and vessel personnel;

d. procedures for reporting accidents and non-conformities with the provisions of the ISM Code;

e. procedures for preparing for and responding to emergencies; and

f. procedures for internal audits and management reviews.

The implementation of a SMS requires a company to document its management procedures and policies to ensure that conditions, activities, and tasks, both ashore and on board the vessels, affecting safety and environmental protection, are planned, organized, executed, and checked in accordance with regulatory and company requirements. For many companies, this may be a relatively simple job of formalizing long established processes and placing the associated documents under a greater degree of control. For others, this process will be much more comprehensive. It may take from 12 to 18 months to develop and implement a SMS under even the best of conditions. The mandatory compliance dates noted in paragraph B are the dates by which companies are to have completed the process of implementation and certification of their SMS for their companies and vessels; they are not the dates on which to begin the process.

The SMS can, and should, also be used as an education tool to ensure that new U.S. federal authorities and requirements are incorporated and understood by personnel required to comply with them during their duties for the company of the vessel. With the amendment, supplement of, interpretations to, or revocation of federal requirements, the SMS can be used to illustrate/educate how these changes effect the management decisions of the vessels company. An example of this are U.S. authorities and federal regulations involving navigation procedures and protection of the marine environment. For example: The Coast Guard has worked closely with the National Marine Fisheries Service and its charter agency, the National Oceanographic and Atmospheric Administration (NOAA), to develop national programs to assist in protection of the Northern Right Whale by providing mariners operating directions for the whale's critical habitat areas on the east coast of the United States. Part of this effort is the publication of navigation warnings for the Northern Right Whale in Coast Guard Notices to Mariners and in the U.S. Coast Pilot publications covering critical habitat areas of the Northern Right Whale. These warnings include the requirements of 50 CFR parts 217 and 222 that establish Northern Right Whale avoidance measures for vessels and reporting criteria for whale strikes. Coast Guard navigation safety requirements for foreign and U.S. vessels are established in 33 CFR part 164. These regulations include requirements for vessels to have aboard the current edition of the U.S. Coast Pilot for the area in which vessels are operating. Compliance with the ISM Code requirements in this part means that companies that own and operate vessels will have in place the means to ensure that vessel Masters are aware of these requirements and educate them of these processes which will effect navigation procedures.

Other amendments to federal regulations due to changes in U.S. authorities or international conventions, can effect pollution prevention issues (EX: OPA 90, FWPCA, PTSA, PWSA, RCRA, etc.…) or vessel safety requirement (SOLAS, MARPOL, etc.…) or other environmental protection issues provided in the authority sections of all the MSM Volumes. These are areas where the safety management system can assist providing management direction to the vessel officers and crew, in understanding changes and extensions of their responsibilities for new requirements for safe operation, pollution prevention and protection of the environment. Finding that such updates or amendments are not part of a safety management system does not necessarily require actions by the Coast Guard. The vessel company or operating company can ensure actions in these situations by educating their employees and documenting corrective action for continuous improvement of the system.

3. SMS Documents

The documents used to describe and implement the SMS may be referred to as the "Safety Management Manual." However, companies are not required to keep the documentation in a manual form but may choose to maintain the documentation in the form they consider most effective. What is important is that in whatever form they choose to keep their SMS, the information in it must be readily available to all the persons who are required to understand and apply that system in the course of their normal duties both ashore and afloat. Companies are required to establish and maintain procedures for the control of their SMS documentation. These controls shall ensure that:

a. valid documents are available at all relevant locations (including all vessels);

b. changes to documents are reviewed and approved by authorized personnel; and,

c. obsolete documents are promptly removed.

4. SMS Certification Process

Certification of a SMS for a vessel requires two determinations to be made by the vessel's flag State: 1) that the company responsible for the vessel has implemented a SMS that complies with the requirements of the ISM Code (33 CFR Part 96 for U.S. vessels); and 2) that the vessel is being operated in accordance with the approved SMS. The goal and purpose of any SMS can be reduced to this simple objective: " say what you do, do what you have said and be able to prove it!" The goal of the ISM Code is to define a continuous process of communication, training, and actions that constantly maintains the vessel in a state of full compliance with safety and environmental protection regulations. The ISM Code does not prescribe the manner in which this must be done, rather it allows companies to define their own way of reaching that goal. There is no one right way to do this because each successful SMS must be built to fit the individual company culture, organization, service and work environment. What may work for one company may not work for another. Inspectors and auditors must therefore be vigilant for companies that attempt to buy a SMS that was designed for someone else or is a generic off-the-shelf program. A SMS that only exists to satisfy what the company sees as just another regulation, for yet another manual that will sit on the shelf, is not the spirit of the ISM Code. Certified auditors and vessel inspectors will quickly identify these short cut attempts to fulfill the intent of the ISM Code.

5. SMS Audit Process

Every initial ISM Code certification audit will be in two parts. First an external audit of the company's safety management system and onshore operations will be completed by an auditor from an authorized organization acting on behalf of the flag administration. Once completed, the company's vessel(s) will be audited on their use of the SMS. The company office audit always comes first because the overall use of the system defines the SMS for the company's personnel, whether they are shoreside or vessel-crew employees. When the company successfully completes its external certification audit, the company, or any person that has assumed or agreed to assume responsibility for operation of the vessel from the company, will be issued a Document of Compliance (DOC) certificate. The DOC must be issued to the company before auditors can proceed to audit vessels using the company's SMS. Each individual vessel that comes under the company DOC, and is found to be operating in accordance with a shipboard SMS that meets the required elements of the ISM Code, will be issued a Safety Management Certificate (SMC). The vessel's compliance with Chapter IX of SOLAS, the ISM Code, is always dependent on it being operated by a company holding a valid DOC. For this reason, a copy of both the company's DOC and the original of the vessel's SMC are required to be maintained onboard the vessel for viewing by flag-state inspectors or port-state boarding officers. IMO Resolution A.788(19) provides guidance on the requirements for the issuance of these certificates, including specific guidelines for the issuance of interim certificates.

6. Document of Compliance (DOC) certificates and Safety Management Certificates (SMCs)

Document of Compliance (DOC) certificates

a. Document of Compliance (DOC) certificates. The DOC is issued to the company following an external audit of a company's SMS. The SMS must be in effect for a mimumum of 3 months prior to the issuance of the initial DOC. The external audit determines whether the SMS complies with the requirements of the ISM Code or 33 CFR Part 96 and is effectively implemented and in use by the company's personnel. The DOC is valid for the types of vessels on which the company's initial verification audit is based. It should be issued for no more than 5 years (60 months) and is subject to annual verification audit within 3 months before or after each anniversary of the certificates issuance date. Many U.S. vessels are owned by non-maritime interests such as a bank or a larger parent corporation. Typically, these institutions do not take a direct hand in the operation of the vessel and their interest is confined to finance. Because of this limited involvement with the vessel's day-to-day operation, these companies do not want to be part of

the SMS. Section 3.1 of the ISM Code requires a company to designate in writing the person or company that will act for the company for the purpose of the SMS (this is most always the vessel's operating company). For companies that do take a direct and continuing hand in the day-to-day operation of a vessel, delegation of company status to another party would not be appropriate. Delegation is allowed by the ISM Code and 33 CFR Part 96, provided a letter of designation has been issued by the company of record to the flag administration designating the company for the SMS. For U.S. vessel(s), this company designation letter is maintained at Commandant (G-MOC), with a copy to the company. Inspectors should note that the company listed on the COI (XYZ Bank of Anywhere USA) might not always be the company listed on the DOC certificate.

Safety Management Certificates (SMCs)

b. Safety Management Certificates (SMCs). The SMC is issued to a vessel following an initial verification audit that its SMS is in compliance with the requirements of the ISM Code and 33 CFR Part 96. The SMC cannot be issued unless the DOC of the company responsible for the operation of the vessel is valid, applicable to a vessel type listed on the DOC and acceptable to the flag administration of the vessel if issued by a different organization. If the DOC is issued by a different organization there should be a statement in the SMC acknowledging the acceptance of the DOC. The external audit must also show that the SMS has been effectively implemented by the vessel's personnel for a minimum of 3 months prior to the initial audit. The SMC is valid for 5 years and requires an intermediate external audit and endorsement on the back of the certificate between the second and third anniversary date of the issuance of the SMC.

7. Interim Certificates

Interim Document of Compliance (DOC) Certificate

a. Interim Document of Compliance (DOC) Certificate. An interim DOC is valid for a period of no more than 12 months. It cannot be reissued after a 12 month period, nor can the date of validity be extended longer than 12 months from the issuance date of the interim DOC. It is expected that during the 12 month period of the validity of the interim certificate, the responsible person will ensure the necessary audits are completed and a final DOC can be issued to the company. This certificate may only be issued to facilitate implementation of the ISM Code when a company is newly established or when vessel types are added to an existing SMS and DOC. The interim DOC certificate should be issued only after the company has demonstrated that it has an SMS that, at a minimum, meets the objectives of Section 1.2.3 of the ISM code and SMS meeting the full requirements of the ISM Code within the period of validity of the interim DOC certificate. In short, this certificate is used to allow the company time to completely integrate its operations as a new company, or of a new vessel or new type of vessel, into its SMS capabilities.

Interim Safety Management Certificate (SMC)
Interim Safety Management Certificate (SMC)

b. Interim Safety Management Certificate (SMC). An interim SMC is valid for a period of no more than 6 months and may be only issued to new vessels on delivery or when a company takes responsibility for an existing vessel which is new to the company. The interim SMC should only be issued when the vessels flag administration, or recognized organization acting on its behalf, has verified the following:

(1) The responsible company's DOC, or interim DOC, is relevant to that type of vessel;

(2) The SMS includes key elements of the ISM Code and has been assessed during the audit for issuance of the responsible company's DOC or demonstrated for issuance of the responsible company's interim DOC;

(3) The master and relevant senior officers are familiar with the SMS and the plans for its implementation;

(4) Instructions or procedures identified as essential are provided to the vessel crew prior to sailing;

(5) The responsible company has confirmed an audit date for the vessel within 3 months; and

(6) The relevant information for the SMS is in a working language or languages understood by the vessel's crew.

An Interim SMC can be extended up to an additional 6 months from the date of expiration in exceptional circumstances which must receive specific approval from the flag administration. For US vessels this must be approved by Commandant (G-MOC)

C. COAST GUARD ENFORCEMENT

Coast Guard ISM Code enforcement policy is divided into two major areas. The first area of responsibility is for U.S. flag vessels mandated to comply with the ISM Code. The Coast Guard is the flag administration agency for the implementation and enforcement of the ISM Code on U. S. Vessels. The Coast Guard administers this responsibility through a delegation to recognized and authorized organizations. The remainder of this chapter will address the US vessel program. The second area of responsibility is verification of ISM Code compliance on foreign vessels entering U.S. ports. Detailed guidelines for enforcement of the ISM Code on foreign vessels subject to the U.S. Port State Control program are contained in NVIC 4-98. This NVIC contains all of the applicable IMO guideline documents for the ISM Code. Therefore, a through review of this chapter, the NVIC and 33 CFR Part 96 is recommended to all enforcement personnel. All policy discussion from this point forward applies only to U.S. flag vessels.

1. Jurisdiction - Flag State

Applicability of the ISM Code to U.S. vessels by service and route is specified in the applicable subchapter of title 46 CFR. If ISM certification is required, specific certification shall be in accordance with the provisions of 33 CFR Part 96 and Chapter IX of SOLAS. OCMI's will not perform ISM Code audits or issue ISM Code certificates. These functions are performed on U.S. vessels exclusively by organizations recognized and authorized by Commandant in writing to act on behalf of the U.S. These organizations must meet specific requirements contained in 46 CFR Part 8 and 33 CFR Part 96, Subpart D.

2. General Guidelines for Enforcement on U.S. Vessels

a. To obtain certification, as defined in 33 CFR Part 96, the company required to be ISM Code certified under SOLAS, shall be advised by the OCMI to select one of the organizations authorized by the Commandant, to issue certificates. A list of organizations shall be presented to the responsible person the time the OMCI advises them. An up to date list is maintained by Commandant (G-MSE) who can be contacted if questions arise regarding the authorization of an organization by the Coast Guard.

b. All requests by responsible parties for safety management system certification waivers or extensions, or equivalence for compliance with the requirements of 33 CFR Part 96 (the ISM Code), shall be forwarded to Commandant (G-MOC) for final decision. However, these requests should be routed through the authorized ISM Code certification organization contracted by the company. The organization will provide their recommendation for approval or denial and forward the request to G-MOC.

c. Commandant G-MOC and G-MO-1 will administer a program of oversight for authorized organizations. Working with OCMIs they will ensure that ISM Code audits and certification are carried out in accordance with the provisions of law, regulation, international convention and written agreement between the Coast Guard and the authorized organization.

d. Several authorized organizations may be selected to act on behalf of the Coast Guard for issuance of ISM Code certification. The checklists and guidelines contained in NVIC 4-98 for foreign vessels will prove a useful tool to marine inspectors checking ISM Code safety management system compliance. In addition, a job aid (quick reference guide) has been developed for inspectors as a way of acquiring a general knowledge of ISM Code requirements. This job aid will be maintained by the Marine Inspection and Investigation School (t-mii) at RTC Yorktown and included as part of the marine inspector course.

e. Vessel that do not have a master: On a U.S. certificated vessel which is manned by a "Person-In-Charge," in the place of a master (most likely a barge) , the person-in charge is responsible for all of the duties and functions required of a master by the ISM Code and the vessel's safety management system.

3. Legal and Regulatory Authority for U.S. Vessels

Legal authority for enforcing the ISM Code on U.S. vessels is contained in title 46 U.S.C. §3203. Regulations for the applicability and implementation of the ISM Code are contained in 33 CFR 96, subparts A, B and C. In addition, individual vessel subchapters in title 46 CFR contain reference to the safety management system requirements for specific vessel types.

4. Voluntary Compliance by the U.S. Domestic Fleet

As previously discussed in the introduction to this chapter, U.S. vessels engaged on foreign voyages and subject to SOLAS must comply with the ISM Code on the dates prescribed for the vessel's service or design. The Coast Guard has sponsored a program of voluntary compliance prior to the implementation dates for the ISM Code to encourage early certification of vessels that will ultimately require mandatory compliance. This program is described in NVIC 2-94. A process for the transition from voluntary certificates to mandatory certificates is described later in this chapter. However, there is an entire group of U.S. vessels that are not subject to SOLAS and, therefore, not required to comply with the ISM Code. The Coast Guard seeks to encourage voluntary compliance with the safety management system requirements of the ISM Code to the maximum extent possible for these vessels. Vessels in this category may be those engaged only on domestic voyages or may be government owned non-commercial vessels operated by the U.S. Navy's Military Sealift Command or the U.S. Maritime Administration Ready Reserve Force. The companies of these vessels are encouraged to seek voluntary certification under the ISM Code and should follow the guidelines established for mandatory compliance. It is recommended that companies voluntarily complying with the ISM Code use the services of the organizations recognized and authorized by the Coast Guard for mandatory certification. Although this may seem restrictive, this will allow the Coast Guard to provide a focused program of oversight which will benefit all certificate customers of these authorized organizations. Companies that voluntarily comply should fulfill the normal requirements of the ISM Code in order to be certified except to accommodate military sealift vessels in reduced operating status or engaged in unique missions. ISM Code certificates on these vessels shall be called a Statement of Voluntary Compliance (SOVC). This term shall be used to describe both the DOC issued to the parent organization and the SMC issued to the vessel(s). Issuance and revocation of the SOVC will be administered in a manner identical to required ISM Code certificates. However, revocation of a SOVC will not restrict the ability of any voluntarily certificated vessel to operate.

5. ISM Code equivalence for certain Small Passenger Vessels

The Coast Guard has established an equivalent to ISM Code compliance for small passenger vessels certificated under subchapter "T" of Title 46 CFR that must comply with the requirements of the ISM Code. These small passenger vessels, which carry more than 12 passengers on foreign voyages, must meet the limited operation requirements below to be eligible for this program.

a. For a vessel's company to apply for equivalency under 46 CFR 175.450, a small passenger vessel's operation must be Coast Guard certificated to carry:

(1) no more than 150 total persons, or

(2) no more than 49 overnight passengers.

b. At the time of the ISM Code rulemaking in 1997, there were approximately 54 U.S. flag small passenger vessels eligible for this type of an equivalence. Because it was felt that ISM Code certification, in accordance with all of the requirements of 33 CFR Part 96, was too extensive for these vessels with limited company personnel, routes and operations, it was decided to allow an equivalent certification system more tailored to these vessels and companies.

c. Regulations for implementing an equivalent safety management system onboard these small passenger vessels in lieu of the normal ISM Code certification are allowed by 46 CFR §175.540. This program of equivalent ISM Code compliance will be directly administered by the Coast Guard as part of the normal scheduled inspection for certification. These small passenger vessels and companies will not receive either a DOC certificate or a SMC instead the Certificate of Inspection (COI) of the vessel will be endorsed with a statement of equivalence to the ISM Code for the specified route. A "job aid" booklet and accompanying floppy disk has been produced by Commandant (G-MOC) to guide small passenger vessel companies through the process of developing their safety management system to that provide an equivalent level of safety for the purpose of the ISM Code. These job aids are intended only to be a guideline and the OCMI should ensure that these equivalent safety management systems have been customized to the vessel's and company's operations and procedures before completing an equivalency inspection of a safety management system.

d. For a small passenger vessel company to apply for an equivalency under this requirement the company must apply in writing to the cognizant OCMI. The written request should relate how the vessel's operation meets the requirements for the equivalency, and a copy of the company's / vessel's safety management system documentation (manual) must be enclosed for initial review.

e. When a U.S. small passenger vessel is allowed to participate in the safety management system equivalent program by the cognizant OCMI, and its system is inspected and approved by the Coast Guard, the vessel's COI shall be endorsed in the vessel operating details with the following statement: "The company's and vessel's safety management system meet the requirements of Chapter IX of SOLAS, through an equivalence program approved by the U.S. Coast Guard."

f. If a small passenger vessel's company does not apply for an equivalence under 46 CFR 175 then it will be expected that the vessel's company will contract with an authorized organization acting on behalf of the U.S. to complete audits and certification of the company's and vessel's SMS. In these cases, Coast Guard inspectors shall note the issuance of the company's DOC and SMC by the authorized organization, during normal small passenger vessel COI inspections. If these international convention certificates, or an endorsement of equivalency to Chapter IX of SOLAS is not held by the vessel, the vessel COI may only be endorsed for a route involving domestic operations.

g. This equivalency program will be monitored by Commandant (G-MOC). Of the approximately 54 vessels able to apply for this program, their operations are normally limited to 5 U.S.- OCMI inspection zones (Portland, ME., San Juan, PR, Miami, FL., San Diego, CA., and Seattle, WA.). It is expected that these programs will be implemented and controlled locally by the OCMI due to the differences of vessel operation and local needs. If a port, other than ones named above, receives an application for such an equivalency from a new vessel company or a vessel moving its operation into a zone not already involved with this program, the local OCMI should contact Commandant (G-MOC) for direction and the issuance of copies of the Coast Guard's ISM Code job aid for use by the OCMI and the vessel's company.

D. DELEGATION OF ISM CODE CERTIFICATION BY THE COAST GUARD TO RECOGNIZED ORGANIZATIONS

1. Authority for Delegation

46 U.S.C. 3103, provides authority to the Coast Guard to rely on reports, documents and records of other reliable persons as evidence of compliance with subtitle II of 46 U.S.C. (ISM Code for safety management system standards are contained in this subtitle). The ISM Code final rule on December 24, 1997, announced the Coast Guard's intention to delegate the function of ISM Code external audits and certifications of U.S. vessels to recognized/authorized organizations rather than perform ISM Code certification as a direct service using Coast Guard personnel (except as noted above for small passenger vessels).

2. Application Process

Recognizing and authorizing organizations to carry out ISM Code certification on behalf of the Coast Guard is the responsibility of Commandant (G-MSE), Office of Design and Engineering Standards. An organization can be recognized by applying in writing to Commandant (G-MSE) following the requirements for application provided by 46 CFR 8. After being recognized by the Coast Guard, an organization may apply for authorization to complete ISM Code external audits and certification for U.S. vessels as outlined in 33 CFR 96, subpart D. Once an organization is authorized to act on behalf of the Coast Guard it will be placed on a list of organizations available to U.S. vessels to complete actions for the Coast Guard. A list of these approved organizations is kept by Commandant (G-MSE).

E. RECOGNITION, AUTHORIZATION AND OVERSIGHT OF AUTHORIZED ORGANIZATIONS ACTING ON BEHALF OF THE U.S.

1. Responsibilities of the Commandant (G-M) Staffs

In the following paragraphs, Coast Guard responsibilities are described. This is provided to ensure understanding of the roles that each office of the Assistant Commandant of Marine Safety and Environmental Protection (G-M) will play regarding the enforcement and compliance of U.S. and foreign vessels with the ISM Code.

a. Commandant (G-MSE), Office of Design and Engineering Standards, shall:

(1) Specify and interpret the detailed requirements contained in 46 CFR 8 and 33 CFR 96 for the process of granting recognition and authorization to organizations applying for Coast Guard delegation to complete ISM Code external auditing and issuing international certificates.

(2) Revoke recognition or authorization to an organization acting upon the behalf of the U.S. in accordance with the regulations and provide guidance for the orderly transfer of company and vessel ISM Code certificates to another recognized and authorized organization, when needed.

(3) Maintain and publish a list of authorized organizations who are authorized to conduct ISM Code auditing and certification on behalf of the Coast Guard. (available on the Coast Guard world wide web page)

(4) Draft and execute with each recognized and authorized organization an agreement which specifies the duties and responsibilities for the performance of work an organization must complete under their authorization to act under the authority of the U.S.

(i) Included in all organization authorization agreements shall be the duties and responsibilities of both the Coast Guard and the recognized organization. The written agreement will specify reports that must be made to the Coast Guard, as well as ensure Coast Guard access to records and information. Information access is critical to facilitate oversight and includes all information of the authorized organization related to the delegation. This information shall include:

- ISM Code certificates issued, to whom and the date of issuance;
- Names and training/qualifications records of persons performing audits;
- Names of companies and vessels undergoing ISM certification;
- External audit reports and results.

(ii) Coast Guard access to information may be limited to U.S. flag vessels receiving either mandatory or voluntary certification. As the flag administration, the Coast Guard shall have on-site, as well as electronic access to records.

b. Commandant (G-MOC), Office of Compliance, shall:

(1) Establish enforcement policies and procedures for implementation of the ISM Code.

(2) Establish and maintain polices and procedures for the effective oversight of organizations authorized to perform ISM Code audits and certification under the authority of the Coast Guard. (see paragraph F of this chapter)

(3) Work with G-MRP-3, G-W, G-MO-1 and the Inspection and Investigation School (t-mii), at RTC Yorktown to implement training and define qualifications for Coast Guard personnel with regard to ISM Code compliance and enforcement for U.S. and Port State Control programs.

(4) Conduct oversight reviews of recognized organization headquarters, regional and port offices, to ensure conformance with the requirements of the written authorization agreement between the recognized organization and the Coast Guard.

(5) Coordinate with Commandant (G-MO-1), District (m) officers, and OCMIs to ensure implementation of oversight, and provide feedback and corrective action to authorized organizations.

(6) Maintain a record of vessel company designation letters, where the legal-financial company of a U.S. vessel has designated another party be the company for the management of the vessel and its safety management system for the purpose of ISM Code certification.

(7) Coordinate with Commandant (G-MSE) on the review of applications for recognition or authorization to perform certification under the authority of the Coast Guard for ISM Code. Also advise G-MSE when evidence exits that an authorization should be revoked. Upon receipt of information of major non-conformities or other failures to follow Chapter IX of SOLAS or 33 CFR 96, take actions to direct the suspension or revocation of a U.S. vessel's SMC or its company's DOC with the local, cognizant OCMI.

(8) Act as final agency authority regarding the granting of equivalencies, appeals or other decisions regarding the certification of a U.S. vessel or its company and its safety management system.

c. Commandant (G-MO-1), Quality Assurance Staff, shall:

(1) Observe mandatory ISM Code audits of the DOC and SMC performed by recognized organizations on U.S. vessels and companies as part of an oversight program.

(2) Perform ISM Code compliance oversight onboard U.S. vessels enrolled in the Alternate Compliance Program during oversight visits for that program.

(3) Establish and maintain a system of measurement for the performance of authorized organizations for ISM Code certification.

(4) Supervise and coordinate assignment of OCMI personnel to perform ISM Code audit observations.

d. Commandant (G-MRP-2), Human Resources Division, shall—

(1) Work with G-MOC, G-MO-1, G-W and the Inspection and Investigation School (t-mii), at RTC Yorktown to implement training and define qualifications for Coast Guard personnel with regard to ISM Code compliance and enforcement for U.S. and Port State Control programs.

(2) Maintain a data base of ISM code lead auditor course trained Coast Guard marine inspection personnel who may perform audit observations.

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2. Responsibilities of Authorized Organizations

Organizations authorized to act on behalf of the U.S. regarding the external auditing and certification of U.S. vessels and their companies shall:

a. Conduct ISM Code certification in accordance with the provisions of regulation, convention and their written agreement with the Coast Guard.

b. Notify Commandant (G-MO-1) prior to the performance of any ISM Code related external audit for the issuance of a company's DOC or vessel's SMC. Freely accept the assignment of qualified Coast Guard observers to accompany their authorized organization personnel during any aspect of the ISM Code certification and audit process. (Training, qualification and rules of conduct are addressed later in this chapter).

c. Notify Commandant (G-MOC) of all major non-conformities issued, or recommendations for suspension or revocation of any DOC or SMC issued under Coast Guard delegation.

Report all major non-conformities, or suspension or revocation of the SMC or DOC to:

- Authorized organizations that issue any statutory certificates to vessel
- The Coast Guard in accordance with the written agreement.

F. COAST GUARD'S ISM CODE OVERSIGHT ON U.S. VESSELS

ISM Code compliance is unique because it is integral with nearly every other aspect of overall regulatory compliance. A basic tenant of any safety management system is that the system must be in constant compliance with safety and environmental protection requirements. Because of this, OCMIs will, in the course of routine material and human element inspections, also provide a means of measuring ISM Code compliance. Compliance confirmation can take several forms, the most basic of which is to simply verify that the vessel has a valid ISM Code SMC and copy of the company's DOC certificate. The next, and more complex, level is to identify links between any deficiencies noted during the course of routine inspections and the vessel's safety management system. This latter task requires that marine inspectors have a working knowledge of the ISM Code elements, as well as knowledge of the duties and training of shipboard personnel. To assist the marine inspector in making these judgments, a training course has been established at the Marine Inspection and Investigation School at RTC, Yorktown. In addition, an ISM Code job aid has been produced. The ISM Code job aid is not a substitute for policy, it is intended to provide a shorthand guide to familiarize the inspector with the ISM Code. The ISM Code job aid also provides a breakdown of the ISM Code's elements and the requirements for each element. All Coast Guard marine inspectors and vessel boarding officers should read and become familiar with the ISM Code, the job aid, NVIC 04-98 and this policy.

1. When to Conduct ISM Code Oversight

Coast Guard oversight of ISM Code auditing or ISM code certification processes for U.S. company or vessel safety management systems will be coordinated through the authorized organization. Any examination of a vessel for any purpose is also an opportunity to judge the effectiveness of the SMS. Although ISM oversight will not be the primary purpose of the visit, inspectors should be alert to potential links between the deficiencies they find performing other inspections and whether those items should have been managed by the SMS. Oversight may also occasionally arise from investigations into vessel casualties, reports by vessel crewmembers, or at the direction of Commandant (G-MOC).

2. Oversight of U.S. Vessels Enrolled in Alternate Compliance Program (ACP)

For U.S. vessels enrolled in the ACP inspectors should verify that a valid SMC and DOC is onboard the vessel. During routine ACP oversight examinations, or annual examinations associated with the issuance or endorsement of the COI, the OCMI's will spot check the overall physical condition of the vessel as well as perform a and human factors examination. Authorized organization's personnel conducting inspections under the ACP shall notify the cognizant OCMI and the organization authorized to issue the vessel's SMC of any significant material deficiency[1] that might effect the validity of the SMC. In accordance with ACP policy and instructions, the surveyor must contact the authorized organization that issued the SMC and/or DOC.

[1] As defined in NVIC 2-95, Enclosure 3, Section B

3. Notification of Authorized Organization Issuing ISM Code Certificates

Any time an authorized organization's surveyor notes significant material deficiencies, serious lack of maintenance to a vessel or its equipment, or failure to follow safety procedures by the crew, the potential or failure of the safety management system procedures should be analyzed. This may include instances of lack of routine maintenance for critical systems or equipment or material failures that have not been submitted as a corrective action request and that indicate a clear failure to follow maintenance or safety procedures by the crew. Information to make this type of determination may be collected by:

a. Observing or interviewing the crew members responsible for the area of the safety management system where the deficient item was noted. Crew members should be knowledgeable about the responsibilities required of them by the safety management system procedures.

b. Verifying that safety management system procedures are being carried out with regard to the area of deficiency.

c. Verifying with the master or responsible crewmember what corrective action has been initiated under the safety management system and sighting evidence of this action. Failure to submit corrective action reports shall be noted and, depending upon the severity and number of instances, shall be reported to the SMC issuing organization. When these failures are found, the representative of the authorized organization acting on behalf of the U.S., must provide a report, orally or in writing, to the cognizant local OCMI. These reports should be made as soon as possible; oral or written reports (which can include emails) should be made within 48 hours.

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4. Coast Guard Actions for Non-Compliance with Safety Management System

If it appears that any portion of the safety management system is not being followed, Coast Guard personnel may issue a CG-835 to the vessel's master requesting verification of compliance from the authorized organization that issued the vessel's SMC and, if the non-conformity is linked to shoreside operations, then also compliance from the authorized organization that issued the company's DOC. It is the master's responsibility to notify the organization issuing the SMC or the DOC. Depending on the severity of the deficiency, the OCMI may allow a reasonable period of time to satisfy the CG-835. In cases where the deficient item would restrict the vessel from sailing, the time allowed by the CG-835 for verification of the SMS should be proportionally short.

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5. Observation of ISM Code Audits by Qualified Coast Guard Personnel

For the purpose of oversight, authorized organizations will allow the Coast Guard to assign qualified personnel to observe any aspect of the ISM Code audit or certification process. During observations, the Coast Guard personnel assigned will respect the authority of the lead auditor and shall not hamper the progress of the audit. Coast Guard personnel shall respect the proprietary nature of any personal or business information accessed through its observation of ISM Code certification audits and shall abide by the provisions of the Privacy Act with respect to that information. As a minimum, all Coast Guard personnel assigned to observe ISM audits shall have completed the ISM Code lead auditor training course at RTC Yorktown. If any material deficiencies are noted during the oversight observation period which effect a vessel's safety or operational capabilities, the lead auditor of the authorized organization must provide a written or oral report to the Coast Guard for action. This report is required no later than 48 hours after completion of the audit. Coast Guard observers to ISM Code review processes or external audits of safety management systems are participating for the purpose of oversight and review, both of the auditors actions and the proper completion of processes. The lead auditor is responsible for all actions on the part of the authorized organization in representing the U.S.

G. REVOCATION OF A DOC CERTIFICATE OR SMC BY THE COAST GUARD

The authority to revoke DOC certificates and SMCs is held exclusively by the Coast Guard. Authorized organizations acting on behalf of the U.S. may provide information, reports or recommendations regarding revocation of these certificates at the request of the Coast Guard.

1. Authority and Grounds for Revocation of DOC

Commandant (G-MOC) has exclusive authority to revoke DOC certificates. Revocation of a DOC certificate shall be based on the finding that a company or responsible person has failed to complete actions to: continuously review and address corrective action reports from the company's or vessel's safety management system operation; correct or address major non-conformity(ies); or a recommendation for revocation of the DOC certificate by the authorizing organization acting on behalf of the U.S. It is not possible to provide a listing of each individual case which will require revocation of a DOC. Each situation will be different as responsible person's and company's safety management systems are customized to the needs of the specific operation of that company. It must be remembered that the revocation of a DOC certificate invalidates the SMCs for all vessels owned by the responsible person or operating under the company's safety management system. Such DOC certificate revocation actions will be documented in writing by Commandant (G-MOC) to the responsible person or company, with copies to the authorized organization which issued the DOC certificate, authorized all organization which issued SMCs under that DOC, and to cognizant OCMIs of certificated U.S. vessels which are owned by the responsible person or its managing company. The cognizant OCMI(s) for these affected vessels, will also be required to amend the vessel's COI(s) for domestic trading only, and accept return of any international convention certificates which will become invalid due to the restriction of the vessel's route.

2. Authority and Grounds for Revocation of SMC

SMCs for a U.S. vessel may be revoked on the authority of the cognizant OCMI or District Commander. Such actions should be discussed with Commandant (G-MOC) before being taken. This is to ensure that other OCMIs who are involved with U.S. vessels owned by the same responsible person are notified of such actions. These OCMIs may wish to review the safety management systems for other vessels under the same company to ensure that parallel problems are not occurring with these other vessels. The revocation of a SMC does not stop a U.S. vessel from operating in domestic trade. When an SMC is revoked, the cognizant OCMI will ensure that the vessel's COI is amended for domestic routes only and that other international convention certificates are invalidated or returned. Interim DOC certificates and Interim SMCs may be revoked by the Coast Guard as listed above.

3. Revocation for Failure to Allow Access to Personnel or Records

Commandant (G-MOC) shall be notified immediately of any instance where a company or its vessel personnel have restricted, denied or otherwise impeded access by the Coast Guard or authorized organization personnel either during a scheduled audit or a safety management system verification. In cases where the obstruction by the company or its vessel personnel was deliberate, the company's DOC shall be revoked immediately Commandant (G-MOC). In such a case, the company or vessel involved in the revocation must reapply and undergo a complete recertification audit to regain its ISM Code certificates.

4. Appeal of Authorized Organizations Decisions Regarding ISM Code Certification

33 CFR 96.495 provides the actions available to a responsible person who wishes to appeal any decision by an authorized organization regarding the auditing and certification of a company or vessel safety management system. The requirements of 46 CFR 1.03 are also available to be used to administratively process appeals to the Coast Guard from responsible persons.

H. CONVERSION OF VOLUNTARY CERTIFICATES ISSUED UNDER NVIC 2-94 FOR COMPANIES AND VESSELS THAT MUST MEET MANDATORY COMPLIANCE PRIOR TO 1 JULY 1998

Background: To facilitate early compliance with the ISM code the Coast Guard authorized three organizations to conduct audits and issue voluntary ISM code compliance certificates to US vessels prior to publishing the regulations contained in 33 CFR Part 96. The three organizations performing voluntary certification prior to 24 December 1997 were: Det Norske Veritas (DNV), Lloyd's Register (LR) and the American Bureau of Shipping (ABS). When Title 46, U.S. Code 3316 was enacted to authorize the Coast Guard to permit recognized organizations to perform mandatory ISM Code certification on U.S. vessels the act also required that prior to granting authorization to a foreign classification society it must be established that the American Bureau of Shipping (ABS) has reciprocal access to vessels of the country where the foreign classification society is based. At the time of the drafting of this chapter neither LR nor DNV had received authorization to perform mandatory ISM Code certification on US vessels pending the resolution of reciprocal access issues for the ABS in both Norway, (where DNV is headquartered) and the United Kingdom (where LR is headquartered). As the ISM implementation date approaches it has become necessary to address the possibility that either or both of DNV and LR may not receive authorization before 1 July 1998. In order to ensure US vessel owners who achieved voluntary ISM certification with either DNV or LR has an ISM code certificate issued under the authorization of the Coast Guard prior to the 1 July 1998 implementation date for the ISM Code, it is necessary to provide a process to ensure the smooth transition of any voluntary ISM Code certificates issued by LR or DNV under Navigation and Vessel Inspection Circular (NVIC) 2-94 guidelines to mandatory certificates.

Implementation:

1. Authorized Organizations Organizations that issued voluntary certificates and later receive mandatory ISM code certificate authorization from the Coast Guard may convert their voluntary certificates to mandatory certificates on a one for one basis. No special or additional audits need to be performed at the time of conversion, just a change of documents. Expiration dates shall remain the same as for the voluntary certificates.

2. Voluntary Certificates issued by DNV or LR under NVIC 2-94

Voluntary Certificates issued by DNV or LR under NVIC 2-94 may to be converted to mandatory certificates issued by either the Coast Guard or ABS. Issuance of certificates by the Coast Guard will be based on a need to meet the impending mandatory implementation date of the ISM. All requests must be made by the vessel owners. If LR or DNV later receive authorization for issuance of mandatory ISM certificates then conversion may occur as in paragraph 1 above. Coast Guard issued ISM certificates will be issued without charge. Owners that elect to convert to certificates issued by an authorized organization will be subject to the fees of that organization for conversion services. Coast Guard issued ISM Code certificates will expire on the same date as the LR or DNV voluntary certificate. Coast Guard issued ISM Code certificates may not be renewed. Renewals must be performed by an organization which has received authorization from the Coast Guard. The Coast Guard will allow the authorized organization conducting the renewal of the Document of Compliance (DOC) to continue to honor Safety Management Certificates (SMC) issued by the Coast Guard until their expiration.

3. Audits and Certificate Endorse-ment

Periodic audits required during the period of validity of Coast Guard certificates may be conducted by LR or DNV auditors accompanied by a Coast Guard observer(s). LR and DNV will notify the Coast Guard in advance of all audits so that a lead auditor trained Coast Guard marine inspector may be assigned to observe the audit. After completion of either a DOC annual audit or the intermediate audit for the SMC, the attending LR or DNV representative will provide a detailed summary of the audit findings and a recommended course of action for the certificate (e.g. Endorsement or revocation) to the cognizant Coast Guard Officer in Charge, Marine Inspection (OCMI). The OCMI's representative (in all likelihood the attending Coast Guard observer) may endorse the Coast Guard ISM Code certificate based on a favorable LR or DNV recommendation. Travel and per diem costs for OCMI personnel to observe audits held outside of the United States will be subject to mandatory reimbursement by the company to the Coast Guard. After completion of the audits LR and DNV will forward a copy of the audit reports to Coast Guard Headquarters, Vessel Compliance Division, (G-MOC).

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CHAPTER 4: INTERNATIONAL CONVENTION ON LOAD LINES, 66/88

A. INTRODUCTION

This chapter discusses issues relative to load lines and the conditions of their issuance. The contents are enhancements to the ICLL 66/88 and 46 CFR Subchapter E. These sources are the primary references for load line actions.

B. LOADLINE REQUIREMENTS FOR VESSELS TRANSITING BEYOND THE BOUNDARY LINE

Recent revisions to the statutory language governing loadline requirements in 46 USC §5102 have eliminated the exemption opportunity vessels previously enjoyed from the wording in 46 CFR §42.03-5(b)(v). This revision applies to all vessels which transit beyond the boundary line, including vessels conducting round-trip domestic "coastwise" voyages without visiting another U.S. port—so called "voyages to nowhere."

Until the regulations in Title 46 CFR are revised, this guidance shall hold as the Coast Guard enforcement policy on loadline requirements for vessels transiting beyond the boundary line, regardless of whether or not another port is visited during that voyage.

C. LOAD LINE CERTIFICATE EXTENSION AUTHORITY

NOTE: This action modifies policy previously set forth in the MSM IV, Ch. 6.F.4.b., and is issued in advance of its revision.

46 CFR §42.07-45 allows Commandant to grant loadline extensions up to the 150 days past the certificate's anniversary date, as provided for in the International Convention on Load Lines. Reference 46 CFR §42.07-45 also allows extensions of up to 365 days on Great Lakes' Load Line Certificates to be granted by Commander, Ninth Coast Guard District (m) (D9). Reference MSM IV, Ch. 6.F.4.b. allows approved assignment authorities to issue extensions up to 150 days based on a satisfactory "complete periodical survey required for the issuance of a new certificate" and approval by Commandant.

In the spirit of harmonization and efficiency, approved assignment authorities may grant extensions of up to, but not exceeding, 150 days for both international and Great Lakes Load Line Certificates. The extensions may be granted by the approved assignment authority without receiving prior written approval from either Commandant or D9, upon the satisfactory completion of:

a. A condition survey afloat, including gaugings and internal examination as necessary to determine whether the vessel is fit to continue in operation during the period of the certificate extension. This survey must confirm that there have been no alterations to the structure, equipment, arrangement, or scantlings, which would affect the vessel in any way relative to the condition of the Certificate's issuance.

b. Correction of any unsatisfactory items found during the afloat survey. These items shall be corrected in accordance with Title 46, Code of Federal Regulations, Part 42.09-45 before the Provisional Load Line Certificate may be issued.

The cognizant USCG OCMI for the examination port is to be notified prior to initiating the extension surveys. He/She may chose to assign a USCG marine inspector to attend during the examination.

Extensions of Load Line Certificates *may not* be granted *after* the Certificate's expiration date. Vessels whose Load Line Certificate expires will be required to have an "initial load line survey" conducted for issuance of a new Certificate. Commandant (G-MOC-2) is to be notified by the approved assigning authority of any vessel that requests extensions after their certificate has expired.

D. USE OF NON-EXCLUSIVE SURVEYORS TO ISSUE LOAD LINE CERTIFICATES

There has been increasing concern about both the diminished availability of local ABS surveyors for issuing load lines, and the additional costs associated with bringing in surveyors from distant locations in order to conduct the required load line examinations. To help alleviate this burden on the vessel owner, ABS may utilize certain non-exclusive surveyors to conduct load line surveys on behalf of the United States Coast Guard. This is an issue that has been addressed in a few different ways officially over the years. This formalizes the Coast Guard policy pertaining to the employment of non-exclusive surveyors for the purpose of issuing, re-issuing and renewing Load Line Certificates.

In the past we have maintained that only the following two groups could perform this function: retired/former ABS Exclusive Surveyors or retired/former USCG Marine Inspectors—qualified to conduct Load Line Surveys. However, this was before ABS instituted its Quality Management System (QMS). With its QMS in place ensuring the qualifications and training of all personnel performing activities on behalf of ABS, we no longer see the need to continue our previous restrictions. ABS' QMS now serves this purpose. ABS may, for the purpose of conducting the requisite load line surveys *only*, utilize those non-exclusive surveyors that meet the following criteria:

- The Non-Exclusive Surveyor's competencies are in full compliance with ABS Quality System Survey Procedure SWZ-002-99-P04.
- For the purpose of issuing Load Line Certificates on behalf of the United States Coast Guard to U.S.-flagged vessels, the Non-Exclusive Surveyor's competencies must be in full compliance with ABS Quality System Survey Procedure SWZ-002-05-P04, and recorded in the Training Certification Record.
- The actual Load Line Certificate is to be issued by the ABS Principal Surveyor. The Non-Exclusive Surveyor may sign for the annual endorsement or provide a Provisional or Short-Term Conditional Load Line Certificate.

NOTE: It is the responsibility of ABS to establish and validate a potential Non-Exclusive Surveyor's compliance under this policy initiative.

CHAPTER 1: HAZARDOUS MATERIALS SAFETY

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CHAPTER 1: HAZARDOUS MATERIALS SAFETY

A. INTRODUCTION

The Coast Guard's concerns for hazardous materials safety include those solids, liquids, and gases (liquefied or under pressure) that are dangerous to human life and property. For purposes of hazard classification, hazardous materials are divided into three main areas: "bulk" liquids and liquefied gases, "packaged cargoes," and "bulk solids." The phrase "carried in bulk" refers to a commodity that is loaded or carried aboard a vessel without containers or labels, and received and handled without mark or count.

B. DEFINITIONS

1. Packaged Cargoes and Bulk Solids

The definition of hazardous materials depends on whether packaged or bulk cargoes are involved. The Hazardous Materials Transportation Act (HMTA) of 1974 (49 U.S.C. 1801-1812) defines a "hazardous material" as "a substance or material that has been determined by the Secretary of the Department of Transportation (SECDOT) to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated" (see 49 CFR 171.8). This is a very broad definition, in that it includes many commodities that may not be allowed for shipment in bulk.

2. Bulk Materials

For the purpose of "bulk" transportation, 46 U.S.C. 2101(14) defines a "hazardous material" as any liquid material or substance that is:

a. Flammable or combustible;

b. Designated a hazardous substance under Section 311(b) of the Federal Water Pollution Control Act (FWPCA), as amended (33 U.S.C. 1321); or

c. Designated a hazardous material under Section 104 of the HMTA (49 U.S.C. 803). (See 46 CFR 153.40 for a listing of materials the Coast Guard has found to be hazardous when transported in bulk under this authority.)

C. CONTROL OF PRODUCT SHIPMENT

1. Bulk Hazardous Liquids, Liquefied Gases, and Solids

The regulations for shipments of bulk and packaged hazardous substances differ in the manner in which a product may be offered for shipment.

Under the bulk rules, a material may not be shipped in bulk without evaluation by the Hazardous Materials Standards Division, Commandant (G-MSO-3). This staff determines whether the material may be shipped in bulk and, if so, the conditions of shipment. The fact that a bulk hazardous material is not listed as regulated does not mean that it is unregulated; indeed, the material may be prohibited from bulk shipment.

2. Products Shipped as Packaged Cargoes

These are evaluated by the shipper, who selects the proper shipping name from 49 CFR 172.101 or 49 CFR 172.102. The package rules state that, unless the regulations prohibit shipment, a material may be shipped under one of the "not otherwise specified" (N.O.S.) categories.

3. Evaluation of New Bulk Liquid Cargoes

Commandant (G-MSO-3) evaluates new liquid cargoes proposed for bulk shipment under the "Criteria for Hazard Evaluation of Bulk Chemicals." These are contained in the International Maritime Organization (IMO) Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Resolution A.212 (latest edition). The criteria include flammability, toxicity, reactivity, and corrosivity. Cargoes whose sole hazard is flammability are regulated under 46 CFR, Subchapter D. Cargoes having hazards in addition to or other than flammability are regulated under 46 CFR 150-154.

4. Department of Transport-ation (DOT) Review

Evaluations of solids carried in bulk (i.e., in cargo holds rather than in some type of container), ships' stores, cargoes under fumigation, bulk liquids, and liquefied gases are under the purview of Commandant (G-MSO-3). The regulations in Title 46, Code of Federal Regulations (CFR) concerning bulk liquids, liquefied gases, and bulk solids are maintained by the Hazardous Materials Standards Division, Commandant (G-MSO-3). The DOT Office of Hazardous Materials Transportation (OHMT) oversees the evaluation of packaged materials and their regulation under Title 49, CFR.

NOTE: Military explosives are regulated under Title 46, CFR 146.

5. Communications with Commandant (G-MSO)

As new products are added almost daily, any published list of authorized cargoes will be outdated quickly. When in doubt about a particular material, Commandant (G-MSO-3) should be contacted. If the cargo is a liquid or liquefied gas to be shipped in bulk or a bulk solid under Title 46, CFR, the division should be called at (202) 267-0103. If the material is to be shipped as a packaged cargo under Title 49, CFR, Commandant (G-MSO-3) should be called at 202/8-F17-1577. Division personnel may be reached from 0700-1530 Eastern time, Monday-Friday. Should a question arise during nonworking hours, a representative of the branch can be contacted through Headquarters Flag Plot at (202) 267-2100.

6. IMO Review

A similar division of responsibility exists within the IMO:

a. The IMO Subcommittee on Bulk Chemicals (BCH) is responsible for the IMO Bulk Chemical Code and Gas Codes;

b. The Subcommittee on the Carriage of Dangerous Goods (CDG) is responsible for packaged cargoes and for the IMO International Maritime Dangerous Goods (IMDG) Code;

c. The Subcommittee on Containers and Cargoes (BC) deals with bulk solids.

NOTE: See Figure F1-1 for a summary of references concerning hazardous materials safety.

D. STATUTORY AUTHORITY

The SECDOT regulates the transportation of hazardous materials under two basic statutes: the HMTA, 49 U.S.C. App. 1801-1812, and Title II of Title 46, U.S. Code. These statutes apply to foreign and U.S. vessels in U.S. waters. Under the authority delegated by the SECDOT, the Coast Guard administers and enforces the laws and regulations for the safe maritime transportation of hazardous materials. Under the HMTA, the Director of the OHMT is authorized to issue regulations for package shipments of hazardous materials. The Coast Guard advises the OHMT in the formulation of these regulations and enforces them, but may not permit exemptions from them. The Ports and Waterways Safety Act (PWSA), as amended, makes the Coast Guard responsible for the safety of waterfront facilities that handle hazardous materials.

➔ See MSM II, Sec. B, Ch. 8 for a general discussion of facility inspections.

FIGURE F1-1: SUMMARY OF INFORMATION CONCERNING THE HAZARDOUS MATERIALS SAFETY PROGRAM

	Bulk Liquids and Liquefied Gases	Packaged Cargoes, Including Portable Tanks	Bulk Solids	Fumigation	Ship' Stores
COGNIZANT SECTION G-MSO	Bulk Cargo	Packaged Cargo	Bulk Cargo	Bulk Cargo	Bulk Cargo
AGENCY WITH AUTHORITY	Coast Guard	Office of Hazardous Materials Transportation (OHMT)	Coast Guard	Coast Guard	Coast Guard
APPLICABLE LAWS	33 U.S.C. 1221 46 U.S.C. Ch. 37	49 U.S.C. 1801	33 U.S.C. 1221 49 U.S.C. 1801	49 U.S.C. 1801	46 U.S.C. 3306 46 U.S.C. 4105 46 U.S.C. 4302
APPLICABLE REGULATIONS	33 CFR Subch. O 46 CFR Subchapters D & O	46 CFR 64,98, and 146 49 CFR 171-179	46 CFR 148	46 CFR 147a	46 CFR 147 and 194
CORRESPONDING INTERNATIONAL CODE OR CONVENTION	IMO Bulk Chemical Code (Res. A.212) Gas Carrier Code (Res. A.328) and Gas Carrier Code for Existing Ships	IMO International Maritime Dangerous Goods Code and U.N. Transport of Dangerous Goods	IMO Code of Safe Practice for Solid Bulk Cargoes	Maritime Safety Committee Circular 298 (MSC Circ. 298)	
MARINE SAFETY MANUAL	Chs 20, F1, 27, & 28	Chs F1 & 29	Chapter F1	Chapter F1	Chapter F1

E. REGULATIONS

1. General

The primary regulations governing the transportation of hazardous materials by vessels are:

CFR Section	Subject
46 CFR 146	Vessels transporting military explosives
46 CFR 147	Vessels carrying ships' stores which are hazardous materials
46 CFR 148	Vessels carrying bulk solid hazardous materials
46 CFR 150	Compatible stowage of bulk liquid hazardous materials and for vessels engaged in bulk hazardous waste incineration at sea
46 CFR 151	Unmanned barges carrying hazardous materials in bulk
46 CFR 153	Self-propelled ships carrying hazardous materials in bulk
46 CFR 154	Self-propelled ships carrying liquefied gases in bulk
49 CFR 171-179	Packaged goods

2. Required Documentation

Under 46 CFR 153-154, the Coast Guard recognizes a Certificate of Fitness (COF) issued in accordance with the IMO Bulk Chemical Code, the International Bulk Chemical Code, the IMO Gas Code for New Ships, and the International Gas Carrier Code together with the International Convention for the Safety of Life at Sea (SOLAS) certificates, as equivalent to a Coast Guard issued Certificate of Inspection (COI), with some exceptions. Issuance of these documents permits issuance of a Letter of Compliance (LOC) with Subchapter O endorsement to foreign vessels without the need for Coast Guard plan review.

A similar situation exists where packaged cargo is concerned. To the extent permitted by 49 CFR 176.11, a packaged cargo shipped on a vessel in accordance with the recommendations of the IMO IMDG Code is acceptable.

NOTE: This does not mean that such vessels will meet all requirements of 46 CFR 153-154.

F. INTERNATIONAL CODES

1. Introduction The codes relative to the carriage of hazardous materials are:

"IMO Chemical Code"

a. The Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals In Bulk, the "IMO Chemical Code," IMO Assembly Resolution A.212(VII), adopted 12 October 1971 and the "IMO International Bulk Chemical Code," IMO Resolution MSC 4(48), adopted 17 June 1983. Applies to all ships with a keel laying date before 1 July 1986. The International Bulk Chemical Code applies to all ships with a keel laying date on or after 1 July 1986. Both the IMO Bulk Chemical Code and International Bulk Chemical Code were revised and reissued to cover requirements stemming from Annex II of the International Convention for the Prevention of Pollution From Ships, 1973, as Modified by the Protocol of 1978 (MARPOL 73/78). Annex II entered into force on 6 April 1987. The revised IMO Bulk Chemical Code was adopted under Resolutions MEPC 20(22) and MSC 9(53). The revised International Bulk Chemical Code was adopted under Resolution MEPC 19(22).

"IMO Gas Code"

b. The Code For The Construction And Equipment Of Ships Carrying Liquefied Gases In Bulk, the "IMO Gas Code," IMO Assembly Resolution A.328(IX), adopted 12 November 1975 and the "IMO International Gas Carrier Code," IMO Resolution MSC 5(48), adopted 17 June 1983. Applies to new ships as defined in the Code with a keel laying date before 1 July 1986. The International Gas Carrier Code applies to all ships with a keel laying date on or after 1 July 1986.

"IMO Gas Code For Existing Ships"

c. The Code for Existing Ships Carrying Liquefied Gases In Bulk, the "IMO Gas Code For Existing Ships," applies to those gas ships not covered by the Gas Code for New Ships.

IMDG Code

d. The International Maritime Dangerous Goods (IMDG) Code Addresses transportation of packaged hazardous materials.

List Of Bulk Materials Possessing Chemical Hazards

e. Appendix B of the Code of Safe Practice for Solid Bulk Cargoes, entitled "List Of Bulk Materials Possessing Chemical Hazards," addresses transportation of bulk hazardous solids. Some of these codes are international recommendations and are not binding under international law. However, several codes dealing with hazardous materials have been incorporated into international law. These include the International Bulk Chemical Code and the International Gas Carrier Code which are both made mandatory by reference in the 1983 amendments to SOLAS 74. With the implementation of Annex II of MARPOL 73/78 on 6 April 1987, the IMO Bulk Chemical Code as well as the International Bulk Chemical Code are mandatory under international law.

2. Application of Codes

Differences Between Codes and U.S. Regulations

Foreign vessels built to the standards of the IMO Chemical Code do not necessarily meet Coast Guard standards. It has been the Commandant's policy to adopt these codes as minimum standards, and to establish higher standards only where essential safety concerns are involved. Because these codes are drafted by an international body, they may be vaguely worded to satisfy all member countries. In contrast, Coast Guard regulations must be as precisely worded and detailed as possible.

Sample Evaluation

The Chemical Code requires that filling pipes extend to "near the bottom of the tank." Corresponding U.S. regulations require that they must extend to within 4 inches or the fill pipe radius of the bottom of the tank. The intent is to provide specific guidance to ship designers on acceptable distances "near the bottom." In this case, for a foreign vessel whose filling pipe terminates "near the bottom of the tank," its IMO COF would be accepted, although its condition does not strictly meet Coast Guard standards.

Sources for Copies of Codes.

(1) IMO Secretariat, Publications Section
4 Albert Embankment
London SE1 75R
United Kingdom
TELEX 23588

(2) New York Nautical Instrument and Service Co.
140 West Broadway
New York, NY 10013

(3) Baker, Lyman & Company
308 Magazine Street
New Orleans, LA 70130

(4) Labelmaster
5724 N. Pulaski Road
Chicago, IL 60646

(5) UNZ & Company
170 Broadway
New York, NY 10038

(6) Southwest Instrument Co.
235 West 7th Street
San Pedro, CA 90731

G. IMO CHEMICAL CODE

1. Introduction

This Code, effective on 12 April 1972, is used for tankships carrying liquid chemicals in bulk. It was somewhat unusual when adopted because it required extensive upgrading of "existing" vessels, to be phased in over a 6-year period. [NOTE: IMO has defined an existing ship as one whose keel was laid before 12 April 1972.] With the exception of damage stability and midship deckhouse arrangements, an existing vessel was required to meet the same standards as a new vessel as of 12 April 1978. The Coast Guard's implementing regulations are located in 46 CFR 153. Due to delays in publication, a contradiction exists between the regulations, which define an "existing" vessel as one for which a contract was let on or before 27 December 1977, and the IMO Code. Thus, a vessel contracted for on or after 12 April 1972, but not later than 27 December 1977, may obtain a COI as an existing vessel under 46 CFR 153, but must be treated as a new vessel in order to receive an IMO COF.

2. Subdivision and Stability

Damage stability standards and protective location of cargo tanks for existing tankships are addressed in subsection 1.7.3(a)-(f) of the IMO Chemical Code and in 46 CFR 153.7(c), as follows:

a. An existing Type III vessel (a single-hulled vessel carrying cargoes requiring Type III containment) is exempt from the Code's damage stability requirements.

b. An existing single-hulled vessel that must have double-bottoms and side tanks installed to continue carrying Type II cargoes should be evaluated to ensure that its damage stability is not impaired by such modifications.

c. An existing double-hulled vessel carrying Type II cargoes is exempt from damage stability evaluation and has less stringent requirements for bottom and side tank location clearances, but must have a double-bottom height of at least 760mm.

d. An existing Type III vessel that is being modified to carry Type II cargoes is required to meet the damage stability requirements of section 2.2.4 of the Code, but is not required to survive damage to the main machinery space.

e. Existing Type I vessels are required to meet the damage stability requirements for new ships, but may be allowed minor relaxations of side and bottom tank separation distances. In effect, these standards exempt existing vessels from damage stability evaluations, unless cargo tank configurations are modified.

3. Design Specifications

As previously noted, the Commandant has waived a plan review for chemical tankers that have valid COF's. However, this does not mean that foreign vessels have the option of obtaining a COF or undergoing plan review. A foreign chemical tanker must have a valid COF to obtain an LOC unless its home administration does not issue IMO certificates. Except for unusual cases, chemical tankers holding LOC's have been designed and equipped in accordance with the IMO Code. Therefore, they should comply with the Code's operating requirements as well as 46 CFR 153. The IMO Code will be the primary reference for examination of foreign chemical tankers.

4. Hull Type Designations

The format and content of the IMO Chemical Code were based to some extent on the U.S. regulations for unmanned barges carrying bulk cargoes (46 CFR 151). The designation of hull types, the table summarizing the minimum requirements, and the referencing of special requirements for individual cargoes will be familiar to users of the unmanned barge regulations. Like 46 CFR 151, the Code identifies three hull types: Type I (most hazardous cargoes), Type II (less hazardous cargoes), and Type III (least hazardous cargoes). It is stressed that there is no direct correlation between ship and barge hull types: a cargo required to be carried in a Type I barge need not necessarily be carried in a Type I ship. The ship hull type designation provides the following information about a vessel:

a. Extent of Hypothetical Damage a Vessel can Sustain and Remain Afloat in a State of Positive Equilibrium. This is a standard used by naval architects to calculate a vessel's survivability. An important factor in plan review, it is of little concern to the inspector.

b. Cargo Tank Location within the Hull. For example, a Type II cargo must be carried in a tank located at a distance greater than the vessel's beam divided by 15 [B/15], but not more than 6 meters above the baseline. In no case may the tank be closer than 760mm to the vessel's side or bottom shell.

c. Maximum Quantity of Cargo that Can Be Loaded in a Tank. Type I cargoes are limited to 1250 cubic meters per tank; Type II cargoes to 3000 cubic meters per tank; Type III cargoes are not restricted.

NOTE: These are loading restrictions, not restrictions on tank sizes.

5. Table of Minimum Requirements

This table, contained in Chapter 6 of the Code, summarizes minimum and special requirements for the products listed. For quick reference, products are listed alphabetically by their generic name. An explanation of the abbreviations used in the table is also provided. There are several terms, however, that require clarification:

a. Tank Vents. Tank venting is described as either "controlled" by a pressure-vacuum valve or safety relief valve or "open" through a gooseneck vent.

b. Tank Environmental Control. This is not clear, as the word "yes" sometimes appears with no explanation of what is required. 46 CFR 153 should be consulted to determine appropriate requirements.

c. Electrical Instruments. Special requirements, identified by "SP," are not contained in the Code.

d. Vapor Detection. These are specified by "no detection," "flammable vapor detection," "toxic vapor detection," or the latter two. Detectors need not be permanently installed types, but may be reagent-tube-and-aspirator types.

NOTE: For some toxic substances, toxic vapor detection equipment is not currently available. The "universal interpretation" of Section 3.11 of the Code permits the substitution of additional air supplies, which are specified in paragraph 3.16-6(b) of the Code, when toxic vapor detection equipment is not commercially available. The COF should indicate when this substitution has been allowed.

e. Fire Protection Requirements. The type of extinguishing medium that is most effective against fires involving particular cargoes (e.g., alcohol-resistant (polar solvent) foam, non-polar solvent foam, water spray, dry chemical, or nonspecific) is identified. The Chemical Code provides standards for fixed deck foam systems aboard vessels contracted after 20 May 1980. These standards include foam monitor configuration, rates of foam production, and foam coverage. Administrations may accept other configurations and foam production rates for vessels that carry a restricted number of cargoes. For vessels built prior to 20 May 1980, individual administrations must approve installations based on their own guidelines.

f. Special Requirements. The last column of the table references special requirements for individual products.

6. Summary

The IMO Chemical Code leaves many areas subject to interpretation. The Commandant has therefore included greater detail in the requirements of 46 CFR 153. Other administrations may have regulations detailing different requirements that aim at the same goal. It is necessary to apply both the Code and the regulations when inspecting a foreign chemical tanker. The Code should be cited as the primary reference, with the regulations providing U.S. interpretation of the Code's requirements. The regulations should not be used for a strict letter-for-letter inspection of a foreign vessel. Navigation and Vessel Inspection Circular (NVIC) 13-82 provides a convenient cross-reference between the Code and 46 CFR 153.

H. IMO GAS CODE FOR NEW SHIPS ("IMO GAS CODE")

1. Introduction

After adoption of the Bulk Chemical Code, IMO began development of a code for liquefied gas ships. At the outset, it was agreed that the code would apply only to new ships, to avoid problems of upgrading existing ships. Because of difficulties that became apparent with the vagueness of the Chemical Code, because the U.S. contributed more detailed requirements for gas ships, and because the requirements did not have to be "loose" to accommodate existing vessels, the Gas Code is much more detailed than the Chemical Code. Indeed, greater specificity was a primary goal of the U.S. in developing the Gas Code; however, some degree of vagueness remains. The requirements of 46 CFR 154 are intended to minimize the effects of this vagueness.

2. Comparison with the Chemical Code

The IMO Gas Code follows the philosophy of the Chemical Code and 46 CFR 153, with some differences. There are four ship types rather than three; one of these is a special category of Type II ship, called a Type IIPG.

> **NOTE:** Ships classed under the Gas Code carry the suffix "G" to distinguish them from chemical tankers.

The damage stability requirements are similar to those for chemical tankers, except that a greater final angle of heel after damage is allowed for gas ships. Type IIPG ships have more relaxed damage stability standards than Type IIG ships. The tank location requirements for Type IG and Type IIG/IIPG vessels are the same as for Type I and II chemical tankers. Type IIIG gas ships are required to have tanks at least 760mm inboard of the hull, while no separation requirement exists for Type III chemical tankers. Also, there is no cargo limitation requirement for Type IG and IIG/IIPG cargoes, as exists for chemical cargoes. Generally, comparison of the Gas and Chemical Codes reveals the Gas Code's much more detailed requirements for tank and piping design, materials, venting, electrical equipment, fire protection, and instrumentation.

3. Minimum Requirements

General

Chapter XIX of the IMO Gas Code contains a Table of Minimum Requirements and references to special requirements for individual cargoes. The ship type is specified for each cargo, with most requiring Type IIG/IIPG ships (in practice, there are no Type IIIG and few, if any, Type IG ships in use). Type IIPG ships, which are small vessels having pressure vessel tanks rated for at least 99.6 psig, may carry most cargoes that are permitted on a Type IIG ship. Exceptions are cargoes with very low transport temperatures, such as methane and ethane.

Pressurized Cargoes

Cargoes that must be carried in pressure vessel tanks, or must have inerted or dried atmospheres above the cargo, are identified in Columns D and E of the Table of Minimum Requirements. The vapor detection requirements are similar to those in the Chemical Code, except that flammable gas detectors and toxic vapor detectors for certain cargoes must be permanently installed, automatic monitors. Gauging is the same as under the Chemical Code, except that there is no provision for an open gauge. Special requirements are treated in a manner similar to the Chemical Code. The alkanes and alkenes (methane, propane, ethylene, etc.) have no special requirements because the Gas Code was drafted in anticipation of liquefied natural gas (LNG) and liquefied petroleum gas (LPG) ships. Thus, they are the "normal" cargoes, with special requirements in the Gas Code to accommodate cargoes having different properties.

Chlorine

Chlorine is addressed in the Gas Code. The first amendment to the Code contains detailed requirements for its carriage. Anhydrous hydrogen fluoride may be added in the future. As neither of these cargoes may be carried on self-propelled vessels in U.S. waters, they are not included in 46 CFR 154.

4. Additional Requirements

Because of the detail of the Gas Code, U.S. regulations correspond much more closely to it than to the Chemical Code. However, four major issues were unresolved during the development of the Gas Code. Since they involved primary safety considerations, 46 CFR 154 exceeds the Code in the following areas:

a. Specification of higher allowable stress factors for Type B and C independent tanks;

b. Specification of lower design ambient temperatures for hull steel selection;

c. Enhanced grades of steel for crack-arresting purposes in the deck stringer, the sheer strake, and the bilge strake; and

d. Prohibition of cargo venting as a means of cargo temperature and pressure control.

NOTE: This is often misunderstood as a total prohibition of venting. The Code provides for controlling cargo pressure and temperature by venting of cargo. However, the Code prohibits the practice of some early LNG ships of mixing boil-off vapors with air and releasing them into the atmosphere.

5. Control of Venting

To carry all cargoes except methane, a vessel must have a refrigeration/re-liquefaction system or tanks designed to withstand the cargo's vapor pressure at 45°C. Any methane boil-off is required to be re-liquefied (to date, this has not proven economically feasible) or burned in the main propulsion system. Other means of disposal, such as incineration, are also permitted. Venting under certain controlled operations, such as gas trials, may be allowed. Emergencies may dictate control of cargo temperature and pressure by atmospheric venting.

6. Application

The IMO Gas Code applies only to new vessels.

I. IMO GAS CODE FOR EXISTING SHIPS

1. Background

Several IMO delegations were concerned that existing ships might be barred from some ports if they did not have some type of IMO certificate. Therefore, the IMO developed the Code for Existing Ships Carrying Liquefied Gases in Bulk for those vessels not covered by the "IMO Gas Code." The Gas Code for Existing Ships is similar to the IMO Gas Code, although some requirements are significantly relaxed. For example, requirements for cargo tank design, materials of construction, and piping design and construction are much less stringent under the Code For Existing Gas Ships, and damage stability evaluation is not required. Basically, this Code embraces previous standards for gas ship construction without requiring major upgrading. It does not distinguish cargo and hull types, and subject vessels may carry the products listed in Chapter 19 of the Code. These products correspond to the Type II and III cargoes listed in Chapter 19 of the Gas Code for New Ships.

> **NOTE:** Type I cargoes are intentionally excluded from the Gas Code for Existing Ships. Only ships designed and constructed to the IMO Gas Code will be considered for the carriage of such cargoes, including ethylene oxide, methyl bromide, and sulfur dioxide.

2. Requirements

The Gas Code for Existing Ships does require some upgrading of existing ships, particularly for instrumentation and fire protection. This upgrading must have been completed by 31 October 1982. Because the Code generally sets a lower standard for gas ships than does the LOC Program, the Coast Guard will not fully adopt it. The note in the preamble that the Code "is not meant to replace any controls which may already be in operation" refers to the LOC Program. Where the Code requires upgrading to a standard that exceeds current U.S. regulations, the Coast Guard will adopt those provisions in 46 CFR 154.

J. SHIPS NOT STRICTLY COVERED BY THE IMO GAS CODES

The Gas Code for Existing Ships was primarily aimed at ships already in service. Although the provisions of the IMO Gas Code and the Gas Code for Existing Ships theoretically apply to all gas ships, there is really a third category of vessels: those under construction when the IMO Gas Code was adopted, but to which it does not apply. It was IMO's intent, as stated in Resolution A.329(IX), that ships under construction should meet the IMO Gas Code as fully as possible, according to their stage of construction. Such ships would, of course, have to meet the requirements of the Gas Code for Existing Ships as a minimum.

K. IMDG CODE

1. Introduction

The IMDG Code was developed by IMO to aid administrations in applying the requirements of Chapter VII of the 1960 and 1974 SOLAS Conventions. The Code contains recommendations for classification, marking, labeling, packaging, placarding, stowage, and segregation of hazardous materials for maritime transportation. It contains information similar to that found in the DOT Hazardous Materials Regulations (49 CFR, Subchapter C).

2. Application

When packaged hazardous materials are shipped intermodally to the port area (i.e., by truck or rail to the vessel), the shipper may use the Optional Hazardous Materials Table in 49 CFR 172.102. This table incorporates many of the IMDG Code's provisions. This is important to the shipper because it facilitates acceptance of the packages at the port of destination.

> **NOTE:** As indicated in 49 CFR 176.11, parts of the IMDG Code may be used in lieu of 49 CFR, Subchapter C for domestic and international maritime shipment of packaged hazardous materials, except Class A and B explosives and radioactive materials.

Cargo must always be segregated and stowed in accordance with 49 CFR, Subchapter C. However, IMO stowage and segregation requirements have been incorporated to the greatest extent possible in Column 7(c), "Other Requirements," of 49 CFR Table 172.102.

3. Alternate Arrangements

Problems may be encountered in trying to comply with the stowage requirements of 49 CFR, Subchapter C. These problems can be resolved by the Captain of the Port (COTP) in accepting alternate stowage procedures under 49 CFR 176.65.

4. Format of the Code

The IMDG Code is a five volume, loose-leaf publication. Its introduction serves the following functions:

a. Explains its purpose and application;

b. Identifies nine classes of dangerous goods; and

c. Gives general requirements for testing, shipping documents, classification, marking, labeling, packaging, freight container transport, portable tanks, stowage, and segregation.

NOTE: Each class of dangerous goods is listed separately. The introduction for each class gives specific requirements that are particular to that class. Each commodity or group of commodities is listed on a separate page, which provides a limited description of the product and its properties, its chemical formula where appropriate, the United Nations (UN) classification number, and synonyms. Annex I of the IMDG Code, found in Volume I, contains recommendations with respect to hazardous materials packaging. Annex I uses a performance-test approach rather than detailed packaging specifications, as is used by DOT. IMO packaging falls into three groups, with Group I packaging subject to the most stringent performance tests and Group III the least. Practically speaking, all hazardous materials must be packaged as required by 49 CFR, Subchapter C, unless they are intended to remain within the port area.

5. Certificates of Competent Authority

Often, the entry on the IMDG Code page for packaging is "Receptacles approved by the competent authority of the country concerned." Other areas of the IMDG Code require specific approval by the "competent authority." In these cases, the OHMT will issue the proper certificate. It is stressed that these are not "exemptions" since they are made in accordance with U.S. law. Shippers desiring competent authority certificates should contact the OHMT at 202-366-4511.

NOTE: Competent authority certificates issued by the OHMT are intended primarily for use in foreign ports. Those issued by foreign governments are valid in the U.S. only in the port area, when the IMDG Code authorizes the use of a competent authority certificate.

L. "RECOMMENDATIONS ON THE SAFE USE OF PESTICIDES IN SHIPS"

This publication, IMO Maritime Safety Committee Circular 298, provides useful information on the safe use of pesticides and rodenticides aboard ships. It is of interest because of the possible health and safety hazards of fumigation to persons aboard. Coast Guard regulations for fumigation are contained in 46 CFR 147A (Interim Regulations for Shipboard Fumigation).

M. INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973, AS MODIFIED BY THE PROTOCOL OF 1978, RELATIVE THERETO (MARPOL 73/78).

1. Authority

MARPOL 73/78 is binding under international law and is implemented domestically in 33 U.S.C. 1901-1911.

2. Annex II

Annex II of the MARPOL 73/78 Convention applies to "noxious liquid substances" carried aboard tankers. The criteria for designating "noxious liquid substances" are similar to the Environmental Protection Agency's (EPA's) criteria for identifying "hazardous substances." The Annex is mandatory; any country ratifying the basic Convention must also accept Annex II (the U.S. has ratified the Convention). MARPOL 73/78 entered into force on 2 October 1983; however, Annex II did not become effective until 6 April 1987. The primary intent of the Annex is to limit and control the discharge of hazardous substances into the sea during normal operations, such as tank cleanings, and accidental pollution resulting from groundings and collisions. The IMO has developed equipment and operational standards for ensuring compliance with Annex II. These standards have been implemented in Titles 33 and 46 CFR. The Final Rulemaking was published in the Federal Register on 12 March 1987.

3. Implement-ation of Annex II

This requires reception facilities to be provided for certain tank cleaning wastes.

> **NOTE:** See NVICs 4-87 and 5-87, MSM Vol. II, Section E, Chapter 1, COMDTINSTs M16450.28 and .29 for guidance on implementing the regulations involving MARPOL Annex II.

4. Annex III

Annex III to MARPOL 73/78 applies to harmful substances carried in packaged form. The U.S. has not yet ratified it.

CHAPTER 2: CARRIAGE OF COMBUSTIBLE AND FLAMMABLE CARGO

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CHAPTER 2: CARRIAGE OF COMBUSTIBLE AND FLAMMABLE CARGO

A. INTRODUCTION

Combustible and flammable liquids are classed as hazardous materials. Regulatory authority and applications are determined by the classification of the cargo. Classification is divided into two main areas: "bulk" shipments and "packaged" cargo. This chapter provides guidance for the carriage of combustible and flammable cargoes in either packaged or bulk shipments. The remaining chapters of MSM II, Section F provide guidance for other hazardous materials shipments.

B. INTEGRAL, PORTABLE, OR FIXED INDEPENDENT TANKS

These tanks may carry flammable or combustible products in bulk aboard cargo, miscellaneous, or passenger vessels in limited quantities, as permitted by the regulations found in 46 CFR 30.01-5, 70.05-30, 90.05-1, and 90.05-35.

C. DEFINITIONS AND INTERPRETATIONS

A determination of whether the cargo is considered a "bulk" or "packaged" shipment is of primary importance in identifying the proper authority and guidance for tank approvals, authorized products, and vessel operating requirements. Vessel inspection requirements are affected by the interpretations of "principal purpose" and "limited quantities." The following criteria and definitions apply in interpreting the regulations for the use of portable and independent tanks:

1. Packaged or Bulk Cargo

Portable tanks, regardless of capacity (tank approvals limit capacity), are deemed "packaged" cargo if the tank contents are not transferred aboard the vessel. The filling, discharge, or recirculating of cargo in a marine portable tank (MPT) or independent tank on board a vessel is regarded as carriage in bulk.

2. Combustible or Flammable Determin-ations

If the cargo is carried as "packaged," use the definitions in 49 CFR 173.115; 46 CFR 30.10-15 and 30.10-22 apply to bulk shipments.

3. Cargo or Passenger Vessel Designation

Vessel type definitions for the carriage of packaged cargo are contained in 49 CFR 171.8. Offshore supply vessels (OSV's) are interpreted as cargo vessels for the purpose of packaged cargo regulations.

4. Cargo

Oil and other combustible or flammable liquids are considered cargo when transported to, and offloaded at, a destination. Fuel oil carried by a vessel in its own integral tanks and for its own use, is not subject to the requirements of 46 CFR 30.01-5. Exceptions to this definition include OSV's and some fishing vessels.

5. Deadweight Tonnage (DWT)

DWT is a measure of a vessel's carrying capacity. It is the difference in displacement between the vessel's "deepest load waterline" and its "lightweight" conditions. Deadweight capacity includes: crew and effects, passengers and luggage, provisions and stores, fresh water, fuel, ballast, and cargo. The "lightweight" condition is defined in 46 CFR 170.055(i). The vessel's "deepest load waterline" is the deepest draft permitted by the applicable regulations for the vessel.

6. Limited Quantity

Flammable and combustible cargo carried in bulk in an amount not to exceed 20 percent of the vessel's DWT is considered limited quantity. For Grade E drilling fluids (mud), the 20 percent volume may be computed using a specific gravity of 1.0.

7. Principal Purpose

When it is deemed that the principal purpose of the vessel is to carry combustible or flammable liquids in bulk in either MPT's or independent tanks, the vessel must be certificated under Subchapter D. Generally, a vessel carrying less than 20 percent of its DWT is not deemed to be principally carrying bulk combustible or flammable cargo.

D. PORTABLE TANKS

These tanks are approved containers designed to be loaded into, on, or temporarily attached to a vehicle or vessel. The tank is designed with approved handling arrangements, such as skids, lifting lugs, or intermodal container castings. Portable tanks may be handled or lifted full or empty and are treated as "packaged" containers. Transfer, fill, discharge, or re-circulation of cargo to portable tanks other than MPT's, while on board a vessel, is prohibited. Portable tanks for flammable and combustible liquids fall into four primary categories:

1. Department of Transportation (DOT) Specification Tanks

These are DOT-51, DOT-57, IM-101, and IM-102 tanks regulated under 49 CFR 178.

2. Special Tanks

These are approved by Commandant (MSC) under 49 CFR 176.340, and are issued a Coast Guard letter of authorization for combustible liquids shipped as packaged cargo. One example is a tank approved for combustible oil based drilling mud, with an open lid top which can be shut gas-tight.

3. DOT-E (Exemption) Tanks

Also called non-specification portable tanks, these may be used to transport regulated commodities when authorized by a Materials Transportation Bureau (MTB) exemption. These tanks are for packaged shipments only. Exemption procedures are outlined in 49 CFR 107. Although exemptions are issued by the MTB, the Coast Guard is consulted if the shipment involves marine transportation.

4. MPT's

Constructed and inspected in accordance with 46 CFR 64, MPT's are designed to be lifted full of cargo (up to 55,000 pounds) and may be considered "packaged." MPT's are also approved for "bulk" shipments and are designed for the transfer of cargo while on board the vessel. Pumping and piping equipment associated with filling or discharging an MPT must meet the applicable requirements of Subchapter F. Endorsement of the Certificate of Inspection (COI) is required for bulk shipments (See paragraph G.2 below).

NOTE: Approval of portable tanks constructed and inspected under 46 CFR 98.35 expired on 1 October 1984. No extensions or waivers are authorized.

E. INDEPENDENT TANKS

These are authorized on miscellaneous vessels and OSV's for the carriage of Grade B and lower petroleum products. They are approved by the Marine Safety Center (MSC) and the cognizant Officer in Charge, Marine Inspection (OCMI) for Grades D and E. Requests for the carriage of cargo classed higher than Grade D must be forwarded through the cognizant OCMI and District Commander (m) to Commandant (G-MOC) for approval. There are no size limitations, except for a 20 percent deadweight capacity limitation. Independent tanks may only be loaded or offloaded empty, and are always considered bulk shipments. The following is a list of conditions for the approval of fixed independent tanks:

1. Design

Tank structure and design arrangements must be submitted to the MSC for approval. The tank may be designed as a gravity tank.

2. Stability and Loading

The vessel's owner or operator must submit stability and deck loading calculations to the MSC showing that the intact stability and structural arrangements of the vessel are adequate with the tank on board. The calculations must cover all intended loading conditions of the tank for the route specified on the vessel's COI. The vessel's stability letter must be amended to indicate any limitations on the carriage of the tank based on stability considerations.

3. Venting

The tank must be fitted with a flame screen and pressure vacuum relief valve, or other suitable pressure relief device.

4. Inspection

The tank must be gas-freed for internal inspection, and hydrostatically tested at least every 4 years.

5. Securing Devices

The tank must be provided with adequate securing devices, and must be secured to the vessel both in accordance with conditions listed on the vessel's stability letter, and to the satisfaction of the cognizant OCMI.

6. Nameplate The tank must have a durable nameplate permanently affixed to the tank structure in an accessible location listing:

a. Manufacturer's name, date of manufacture, and serial number;

b. Design pressure and test pressure in psig;

c. Volumetric capacity in gallons;

d. Maximum net weight and maximum gross weight in tons; and

e. Hydrostatic test date.

F. AUTHORIZED PRODUCTS

1. Portable Tanks

Products which may be carried in portable tanks are specified in 49 CFR 173.119 and the IM tank table published by the MTB (for IM tanks only). Portable tanks approved under 49 CFR 176.340 may only be used for combustible liquids (flashpoint (FP) between 100 and 200° F) having no other hazard.

2. MPT's

MPT's may carry combustible liquids on cargo and passenger vessels. The carriage of flammable liquids (FP below 100° F) is limited by 49 CFR 173.119(a)(29) to cargo vessels engaged in offshore oil well drilling activities.

3. Independent Tanks

Fixed independent tanks may carry flammable and combustible liquids in bulk, Grade B and lower, as authorized for vessels under 46 CFR 30.01-05 and 90.05-35.

G. VESSEL OPERATING REQUIREMENTS WHEN CARRYING PORTABLE OR FIXED INDEPENDENT TANKS

1. Tonnage Measurement

Independent tanks are subject to inclusion in gross tonnage if they meet certain size criteria and cannot be considered as deck cargo (freight). Addition or removal of such tanks on a vessel which has already been assigned gross and net tonnages could require vessel remeasurement and assignment of new tonnages. Refer to Navigation and Vessel Inspection Circular (NVIC) 11-93 for details.

2. COI Endorsement

Except for portable tanks on Subchapter T vessels, a COI is not required for the carriage of flammable or combustible liquids in packaged form. Endorsements are required for all bulk combustible and flammable liquid cargo shipments. The COI should be endorsed for all independent tanks and MPT's equipped with fill or discharge piping, as follows:

a. For the carriage of fixed independent tanks, the COI endorsement shall include a statement that the tank shall be lifted on or off the vessel only when completely empty, and a list of specific cargoes permitted to be carried.

b. For the carriage of bulk cargo in an MPT, the COI endorsement shall include a list of specific cargoes authorized, and an authorization to transfer to and from the MPT.

c. For the carriage of combustible cargo in integral tanks, a sample COI endorsement is "inspected for the carriage of Grade E combustible liquid drilling fluids in the following tanks: (specify each tank and capacity in gallons)."

d. For packaged hazardous materials on Subchapter T vessels in portable tanks, a sample COI endorsement is:

> "Approved for the carriage, on open deck, of portable tanks containing hazardous materials as authorized by 49 CFR 172.101. For flammable or combustible liquids, additional fire protection is to be provided in accordance with 49 CFR 176.315. Tanks may not be discharged or filled on board. Not more than 16 passengers may be carried when portable tanks are not certified gas free."

3. Firefighting

The vessel's firefighting capabilities must meet the requirements of 46 CFR 98.30-37 and 39 for bulk carriage, and 49 CFR 176.315 for packaged shipments. No endorsement on the COI for the extra firefighting equipment is necessary.

4. Fixed Firefighting

46 CFR 95.05-10(g) requires a fixed firefighting system to be installed in all tanks carrying combustible cargo. This has been shown to be impractical for drilling mud and other cargoes which could clog a fixed system. Further relaxation of this regulation have been granted to OSV's. In view of the high FP of Grade E cargoes, and the tank arrangements on OSV's, this requirement may be relaxed on OSV's carrying Grade E cargoes at ambient temperatures. This requirement will not be relaxed for Grade D cargoes or for Grade E cargoes at elevated temperatures. Fixed firefighting requirements do not apply to MPT's or fixed independent tanks.

5. Tank Fill/ Discharge

Cargo may not be transferred or recirculated from or to portable tanks, other than approved MPT's, while on board a vessel. Fixed independent tanks must be loaded and offloaded while on the vessel and can only be moved when completely empty. MPT's are specifically designed to be transported either empty or full. Pumping and piping equipment associated with MPT's and fixed independent tanks must meet the applicable requirements of Subchapters F and J.

6. Stability

The carriage of portable or independent tanks must be in accordance with the vessel's stability letter or booklet, regardless of any endorsement required on the COI.

7. Stowage

Portable tanks containing flammable liquids, or combustible liquids with an FP less than 141° F that are insoluble in water, are restricted by 49 CFR 176.76(g)(3) to "on deck" stowage. Other combustible liquids in portable tanks may be stowed on deck or underdeck on passenger and cargo vessels.

8. Tankerman

A tankerman is not required when transferring to or from an OSV's fuel tank. A tankerman is required for transfer to, from or between MPT's, independent tanks, or integral cargo tanks.

H. VESSEL TYPE REQUIREMENTS

1. OSV's

Special consideration for OSV's was provided in P.L. 96-378, now 46 U.S.C. 3710(a). However, the considerations of principal purpose and limiting quantities apply to OSV's. An OSV may not carry more than 20 percent of its deadweight in bulk liquid cargo. Regardless of the subchapter under which they are certificated, OSV's are considered cargo vessels for the purposes of 49 CFR, and may carry combustible or flammable liquids in approved portable tanks. Bulk combustible or flammable cargo is authorized under 46 CFR 90.05-35. The COI shall be endorsed for cargo carried in bulk.

2. Small Passenger (Subch. T) Vessels/ Crew Boats

For the purposes of 49 CFR Subchapter C, T-boats on domestic voyages are considered "cargo vessels" when carrying 16 or less passengers and "passenger vessels" when carrying more than 16 passengers (see 49 CFR 171.8 for the definitions of "cargo vessel" and "passenger vessel"). Hazardous materials may be carried in approved portable tanks only when operating as a "cargo vessel" and specifically authorized by COI endorsement. Transfer of cargo to or from a portable tank or other packaging on board the vessel (with or without passengers aboard) is not authorized.

3. Subchapter I Barges

Cargo barges certificated under Subchapter I may not carry combustible or flammable liquids in any quantity in bulk. They may carry MPT's if the tank is not equipped to transfer cargo.

I. SPECIAL PRODUCTS

1. Drilling Fluids The composition of drilling fluids, such as mud, may vary depending upon its use and source. Drilling mud with a FP greater than 200° F is not regulated as a hazardous material under 49 U.S.C. 1801-1812 (49 CFR 100-177). Because drilling fluids are considered a product and service unique to the offshore oil industry, the "limited quantity" is defined as 20% of the DWT at a specific gravity of 1.0 for OSV's carrying Grade E drilling fluids. (See Section A, Chapter 1 for requirements when carrying Grade D and above cargoes.)

Mud Characteristics

a. Mud Characteristics. There are two general categories of mud: water based and oil based. Water based mud which does not contain any oil is not subject to the requirements of combustible liquids. Industry may designate mud as water based even though it contains oil. Oil in any amount will subject the mud to the requirements of this chapter. Generally, mud containing oil is considered a Grade E combustible liquid. However, it may be classed even higher (such as for "spent" or recycled mud). It is the shipper's responsibility to know the characteristics of the mud.

Carriage

b. Carriage. Oil based mud must be carried in integral, portable, independent, or other approved tanks under the same considerations as other bulk combustible cargo. Oil based mud may not be carried in open hopper type tanks, or in any other non-approved independent tanks.

Quantity

c. Quantity. Because of the densities of mud, special considerations should be given for stability of the vessel and sizing of independent tanks. The 20% deadweight limit is computed using a specific gravity of 1.0. Special consideration may be given by Commandant (G-MOC) for existing vessels to carry greater amounts.

2. Oil Field Wastes Wastes, solids, cuttings, etc., that contain oil in any quantity are considered hazardous materials under the FWPCA. Material which has been contaminated by oil, even if washed, processed, or otherwise diluted to a low combustibility hazard, are regulated as Grade E products if capable of leaving a sheen. Therefore, transportation in nonapproved tanks or uninspected barges, (such as open hopper) is not authorized.

3. Lube Oil Lube oil and other Grade E products with an FP greater than 200° F are not regulated under 49 CFR when carried in packaged form.

4. Methanol

Methanol (Methyl Alcohol) is a Grade C flammable liquid that is used by the offshore oil industry. The carriage of methanol in either integral or fixed independent tanks on OSVs is authorized, provided the following conditions are met:

a. Paragraph 11.H, Applicable Tank Vessel Requirements, of this chapter applies.

b. Paragraph 11.I, Vessel Operating Requirements, of this chapter applies.

c. A B-V semi-portable fire extinguisher must be provided on the open deck capable of reaching the methanol cargo tanks, tank vents, and transfer connections. A fixed extinguishing system meeting the requirements of 46 CFR 34.05-5 must be provided to protect methanol pump rooms. Portable fire extinguishers must be provided as denoted for cargo areas in 46 CFR Table 34.50-10(a). If used, the foam extinguishing agent for semi-portable and portable fire extinguishers protecting methanol areas must be of the polar solvent (alcohol resistant) type.

d. Methanol tanks may not be located vertically below the vessel's accommodations, service spaces, or navigating stations.

CHAPTER 3: CARRIAGE OF BULK LIQUID CHEMICALS

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CHAPTER 3: CARRIAGE OF BULK LIQUID CHEMICALS

A. CRITERIA FOR REGULATION

The liquid chemicals regulated as "hazardous materials" under 46 CFR, Subchapter O (Certain Bulk Dangerous Cargoes) have one or more of the following properties:

- Unusual flammability (e.g., wider flammable limits, lower auto-ignition temperature), compared to normal petroleum products;
- Toxicity (chronic or acute);
- Corrosivity;
- Self-reactivity (polymerization);
- Instability or unusual reactivity;
- Pyrophoricity (auto-ignition); or
- Marine pollution (damage to marine resources, bio-accumulation, tainting of seafood, reduction of amenities).

B. PRODUCT EVALUATION

1. Initial Review

Before a new liquid product (or "commodity") may be shipped in bulk, the shipper or manufacturer submits a completed Form CG-4355, Characteristics of Liquid Chemicals Proposed for Bulk Water Movement, or the International Maritime Organization (IMO) equivalent, Circular Letter No. 944, "Characteristics of Liquid Chemicals Proposed for Marine Transport in Bulk," to the Hazardous Materials Standards Division, Commandant (G-MSO-3). The data on this form, along with other information in available literature about the product, are then evaluated. Based on the properties of the product, a decision is made to place it in one of the following four categories:

- Flammable or combustible liquid regulated under 46 CFR, Subchapter D;
- Hazardous or polluting materials regulated under 46 CFR, Subchapter O;
- Too dangerous to be shipped in bulk; or
- "Unregulated."

2. Authorization for Shipment

If a product that is offered for shipment is not included within one of these categories and the shipper cannot produce written authorization for shipment, Commandant (G-MSO-3) can be contacted by telephone (commercial/FTS: 202/8-267-0103). Until the product has been evaluated and authorized for shipment, it is considered prohibited for bulk carriage. If the product is within the purview of Subchapter O, tentative minimum requirements for its safe carriage are developed. Commandant (G-MSO-3) advises the shipper and all district commanders (m) and the Marine Safety Center (MSC) of these requirements by letter or telex. This facilitates movement of the product, prior to adoption of the minimum requirements as a final rule. Eventually, the product is included in 46 CFR Table 151.05, Table I of 46 CFR 153, or Table 4 of 46 CFR 154.

3. Regulatory Control

If the product has no significant hazards, other than flammability or combustibility, it is regulated under 46 CFR, Subchapter D. If it possesses one or more of the properties listed in section F3.A above, it is regulated under Subchapter O.

> **NOTE:** The definitions of "flammable" and "combustible" in Subchapter D differ from those in 49 CFR, Subchapter C.

A list of products regulated by neither Subchapter D nor Subchapter O is given in Appendix I to 46 CFR 153. Cargoes that have been reviewed but are presently not permitted in bulk in U.S. waters are:

- Acrolein;
- Chlorine (on self-propelled vessels);
- Ethylenimine;
- Hydrofluoric Acid;
- Hydrogen;
- Hydrogen Chloride;
- Hydrogen Fluoride;
- Methylcyclopentadienyl Manganese Tricarbonyl;
- Nitric Acid (greater than 70 percent concentration);
- Nitrogen Tetroxide;
- Oxygen;
- Phosphorus Trichloride; and
- beta-Propiolactone.

C. PRODUCT CLASSIFICATION

1. General Requirements

Generally, products should not be shipped under trade names, but rather under one of the names in the four categories given in paragraph F3.B.1 above. The only exception is a mixture consisting solely of products listed in Subchapter D or "unregulated" products. Among the characteristics of interest in classifying a particular product and developing minimum requirements for its carriage in bulk are:

- Flashpoint;
- Vapor pressure;
- Flammable limits;
- Auto-ignition temperature;
- Temperature of carriage;
- Boiling and freezing points;
- Toxicity of liquid and vapor;
- Reactivity with itself, air, water, or materials of construction;
- Corrosivity to human skin and materials of construction; and
- Marine pollution potential.

These and other chemical and physical properties are evaluated to determine requirements for safe carriage, such as hull type, temperature and pressure of carriage, vent height, gauging and venting types, firefighting media, materials of construction restrictions, and electrical class and group. The overriding principle used in developing requirements is containment of the product, commensurate with its hazards.

2. Sample Evaluations

Caustic soda (sodium hydroxide) is highly corrosive to human skin. It is also nonflammable and nontoxic, has virtually no vapor pressure, and is not corrosive to mild steel. Accordingly, this product has minimum requirements for carriage in a single-hull vessel, with open gauging and venting, no specified vent height, no special firefighting media, and no special electrical equipment requirements. However, aluminum is not allowed in construction due to its corrosion by caustic soda and the associated generation of hydrogen. By contrast, allyl chloride is highly flammable and toxic, becomes more corrosive when wet, and has a relatively high vapor pressure. Accordingly, the requirements for its carriage specify separation from the vessel's hull, closed gauging and controlled venting (pressure-vacuum valves), a high vent, and special firefighting media and electrical equipment. The pressure-vacuum valve is required to be set at or above 21 kilopascal (kPa) gauge (3 psig) to minimize the venting of cargo due to tank breathing.

3. Awareness

Data on the properties of these products is important to merchant mariners and to marine inspectors as well. For their own safety, inspectors obviously must be aware of the properties of cargoes handled while they are aboard a vessel. Also, particular cargo properties may influence the officer in charge, marine inspection (OCMI) requirements for correction of deficiencies found during routine inspections.

4. Sources of Information

The inspector can usually find all necessary information on product properties in the latest editions of the Chemical Data Guide for Bulk Shipment by Water, Commandant Instruction (COMDTINST) M16616.6, and the Chemical Hazards Response Information System (CHRIS) Manuals, COMDTINST M16465.11 and .12. For more information on product properties or advice on certain requirements, Commandant (G-MSO-3) may be contacted at 202-267-0103.

D. POLYMERIZATION

1. Introduction

Certain chemical products, called monomers, are required to be "inhibited" to prevent polymerization during transportation. A polymerization reaction is generally exothermic (characterized by the release of heat) and usually leads to the formation of a solid. Depending on the rate of reaction, polymerization may occur violently, causing severe structural damage by over-pressurization, or very slowly, resulting only in blocked transfer lines. Unfortunately, it is not precisely known which monomers will behave violently in specific instances. Accordingly, the possibility of cargo polymerization must always be viewed as a serious matter.

2. Use of Inhibitors

Inhibitors are chemicals added to the monomer to help prevent its self-reaction. The regulations identify which cargoes need inhibitors, although they do not specify types or amounts. They also require the shipper to furnish a cargo certificate identifying the inhibitor used, the amount, the duration of its effectiveness, any temperature limitations, and actions to be taken if the length of the voyage exceeds the duration of the inhibitor (see 46 CFR 153.912 and 154.1818).

E. CHEMICAL TANKSHIPS

1. Introduction

The modern chemical tankship is a small, sophisticated vessel, usually of 20-30,000 deadweight tons (dwt) and having up to 42 tanks. These tanks are often coated, lined, or constructed of stainless steel. Such protective measures enable the carriage of cargoes that normally attack mild steel, and ensure product purity. Piping and pumping systems are more highly segregated on these vessels than on conventional tankships, and deep well or submerged pumps are used in lieu of the traditional pumproom. The tanks are generally smaller, since most chemical cargoes are shipped in relatively small parcels. Hence, the terms "parcel tankers" and "drugstore ships" have been used to refer to this class of ships.

2. Chemical Tankship Operations

The nature of the chemical trade is such that chemical tankship operations differ somewhat from those of conventional petroleum product tank vessels. Because of the small size of most cargoes, the parcel tanker usually visits many ports, sometimes moving among several berths in each port on a voyage. Others, however, are dedicated to a particular cargo carried on a regular route. As a result, some parcel tankers are approved for only one or two products, although most may carry many products. In general, chemical tankships carry chemicals that are flammable and similar to petroleum products in some respects, and they often carry "clean products." Consequently, U.S. chemical tankers are certificated under 46 CFR, Subchapter D and endorsed to carry products under 46 CFR, Subchapter O. The requirements in Subchapter O supplement, rather than supersede, the requirements of Subchapter D, unless stated otherwise.

3. Applicable Regulations

The regulations for chemical tankships are contained in 46 CFR 153 (Safety Rules for Self-Propelled Vessels Carrying Hazardous Liquids). In accordance with the IMO Bulk Chemical Code, they became fully effective for existing tankers on 12 April 1978. The only provisions of the regulations with which existing tankers need not comply are:

Subject	CFR Cite
Damage stability	46 CFR 172.130 and 133
Door location	46 CFR 153.202
Tank location	46 CFR 153.230 and 231
Accommodation space location	46 CFR 153.234

4. Miscellaneous Considerations

The damage stability requirements for existing chemical tankers are described in paragraph F3.F.4 below. Tank location requirements are relaxed for existing tankers, except that the distance between a Type II containment system and the vessel's bottom may not be less than 760mm (30 inches). These considerations are handled by the MSC and Commandant (G-MSO). However, the inspector will be concerned with the relaxed provisions for accommodation spaces and door locations. Currently, the regulations do not prescribe specific standards for accommodation spaces in midship deckhouses on existing parcel tankers. It also has been found impractical to demand compliance aboard existing ships with the door location requirements of 46 CFR 153.202. The Coast Guard and other IMO administrations have agreed to guidelines for the treatment of midship houses and door locations on existing ships. These are provided in paragraph F3.F.3 below.

F. SAFETY RULES FOR SELF-PROPELLED VESSELS CARRYING HAZARDOUS LIQUIDS (46 CFR 153)

1. Introduction

As with any set of regulations, several areas in 46 CFR 153 have been modified, interpreted, and clarified, as problems in their application were encountered. The following guidance was developed to ensure uniformity in the interpretation and application of 46 CFR 153. Technical problems in applying these regulations should be brought to the attention of Commandant (G-MSO-3) at 202-267-0103.

2. Applicability

Inquiries have been made concerning the application of 46 CFR 153 to a parcel tanker carrying cargoes regulated under Part 153 only in a limited area of the cargo containment/tank section of the vessel. Many people have supposed that 46 CFR 153 would not apply to any areas of the cargo containment/tank section, if subject cargoes were not carried in these areas. An extension of this logic would lead to the treatment of individual tanks and piping systems as separate zones, subject to either 46 CFR 153 or Subchapter D. This approach, however, was never intended by the Commandant. While some situations may warrant special considerations, and although cargoes regulated under 46 CFR 153 may be carried in only some of the cargo tanks, Part 153 standards for fire protection, ballast piping and equipment, electrical equipment, personnel safety, and operational requirements shall be applied to the entire cargo containment section of the vessel.

3. Standards for Midship and After Deckhouses Aboard Existing Vessels (46 CFR 153.7(c)(3)-(5))

Under 46 CFR 153.7(c)(3), (4), and (5), allowances have been made for existing vessels not meeting 46 CFR 153.234 requirements (i.e., vessels that have midship deckhouses). Additionally, such vessels often cannot comply with 46 CFR 153.200 and 153.202 (General Vessel Arrangements) requirements. The IMO Chemical Code made allowances for existing vessels with midship deckhouses, but did not specify initially how such vessels would be treated. The IMO later adopted a U.S. proposal for uniform interpretation of this topic. As a result, existing chemical tankers having an accommodation space in a midship deckhouse within the boundaries of the cargo area, may continue to operate with this arrangement. When toxic cargoes (those for which 46 CFR 153.526 is given as a special requirement in Table I of 46 CFR 153) or flammable cargoes are carried in the cargo tanks below the midship house, the following standards shall be applied:

Cargo Tank and Accommodation Space Boundaries

a. Accommodations are not allowed in the space bounded by the tops of the cargo tanks and the first deck of the midship deckhouse (referred to as the "bridge space").

No Through Deck Penetrations

b. Cargo tank tops forming a boundary of the bridge space shall be free of any through deck penetrations, such as cargo tank hatches, Butterworth openings, deep well pumps, ullage openings, and sounding tubes.

Deck Penetrations

c. Electrical cables, pipe runs, and other penetrations in the first deck of the midship deckhouse, immediately above the cargo tank tops, are allowed, provided they are made gastight. Doors, hatches, and other access openings in this deck of the midship house are not permitted.

Ventilation Systems

d. When the bridge space is bounded by a bulkhead at either side at the fore or aft end, the ventilation system must meet the requirements of 46 CFR 153.312 and 110.15-1(b)(16). The increased ventilation rate prescribed in 46 CFR 153.316 does not apply to the bridge space, regardless of the cargo carried.

Electrical Installations

e. Electrical installations within the bridge space shall meet the requirements of 46 CFR, Subchapter J.

Non-Welded Fixed Cargo Piping Joints

f. Except for approved connections to shut-off valves and expansion joints, runs of fixed cargo piping with non-welded joints shall not be permitted in the bridge space.

Equivalencies

g. For existing vessels that are unable to meet the requirements of 46 CFR 153.200 and 153.202, the following measures are considered to provide an equivalent standard of safety, and are acceptable in accordance with 46 CFR 153.10. These measures apply to the carriage of any cargo listed in Table I of 46 CFR 153, in any tank on the vessel:

(1) Portlights located on the forward bulkhead of the aft deckhouse accommodation and on the midship house bulkheads facing the cargo area, except for wheelhouse windows, shall be fixed (i.e., incapable of being opened) and gastight. Wheelhouse windows shall meet the requirements of 46 CFR 153.200. Doors in the forward bulkhead of the aft deckhouse accommodation, that access the cargo tank deck, shall be permanently sealed. Where existing arrangements preclude this, a suitable airlock arrangement at the door location shall be provided. This installation must include a gastight, self-closing metal outer door and a "substantially gastight," self-closing inner door (the inner door shall be at least a metal joiner door). The airlock space between the doors shall be mechanically ventilated from a nonhazardous location and maintained at overpressure to the space outside the airlock. An audible and visual alarm system shall be provided to give warning on both sides of the airlock, if both doors are open simultaneously.

(2) Portlights on the side of the after deckhouse must also be fixed and gastight, if they are located:

(a) On the first deck (tier) above the cargo deck; and

(b) Within 10 feet of the forward bulkhead, or within that distance aft of the forward bulkhead to the first side door, whichever is less.

(3) Doors located more than 2.4 meters above the cargo tank deck and facing the cargo tank area shall be "substantially gastight" and self-closing. This provision applies to doors on the aft deckhouse accommodation, as well as the midship house (the Commandant has determined that solid metal or wooden joiner doors, except those having screens or louvers, will fulfill this requirement).

(4) Because accommodations are not allowed in the bridge space, doors accessing the cargo tank deck from the bridge space are exempt from these requirements.

h. Some existing chemical tankers have been constructed so that the after accommodation spaces partially extend over a cargo pumproom (which forms the after end of the cargo tank area). If this pumproom services tanks that carry cargoes regulated under 46 CFR 153, the ventilation requirements of 46 CFR 153.312 and 153.316 for the pumproom must be met. The pumproom ventilation system must be in operation at the following times:

(1) During all phases of cargo handling and transfer;

(2) During tank cleaning and gas-freeing; and

(3) Whenever work involving equipment within the pumproom is undertaken.

4. Damage Stability Requirements for Existing Vessels

General

a. General. 46 CFR 153.7(c)(3) and (5) permit the endorsement of an existing vessel's cargo containment system as Type II or Type III, if the vessel has a Load Line Certificate and meets any additional requirements listed. Existing vessels need not meet the damage stability requirements of the IMO Chemical Code. Since 46 CFR 153 was developed from the Chemical Code, 46 CFR 153.7(c)(3) and (5) provide a similar waiver for existing vessels. Accordingly, such vessels need not meet the damage stability standards of 46 CFR 172.130, 172.133, and 153.231(b).

Endorsements for Type II Containment

b. Endorsements for Type II Containment. 46 CFR 153.7(c)(3) imposes tank shell separation requirements for the endorsement of Type II systems. A valid Load Line Certificate does not guarantee that an existing vessel meets any particular damage stability standard, or that damage stability calculations were ever made. Consequently, the requirement for the Load Line Certificate under 46 CFR 153.7(c)(3) and (5) should be considered in this context.

Requirements for Conversions

c. Requirements for Conversions. 46 CFR 153.7(c)(4) stipulates that existing vessels undergoing conversions, by addition of double bottoms or wing tanks, for upgrading to a Type II containment system, must meet the damage standards of 46 CFR 153.135 and 153.150 in all areas of the vessel, except the machinery spaces. Damage stability calculations are required for modifications of this nature and other structural modifications.

5. IMO Certificates

A vessel that meets the definition of an existing vessel under 46 CFR 153.7(a)(2), and whose keel was laid after 12 April 1972, is considered a "new" vessel under the IMO Chemical Code. If the owner of such a vessel applies for an IMO Chemical Code Certificate of Fitness (COF), the vessel is required to meet the requirements of 46 CFR 153 and the recommendations of the IMO Chemical Code as applicable to new ships. (46 CFR 153.12)

6. Hull Type Calculations and General Vessel Arrangements

For existing vessels see paragraph F3.F.4 above regarding damage stability standards and paragraph F3.F.3 above concerning standards for midship and aft deckhouses. (46 CFR 153.19, 172.130-150 & 46 CFR 153.200-202)

7. Personnel Emergency and Safety Equipment

a. 46 CFR 153.214(a). Under section 3.16.9 of the IMO Chemical Code, only one stretcher is required (see paragraph F3.F.29 below).

b. 46 CFR 153.214(c). 46 CFR 153 contains no standards for evaluating first aid kits; any first aid equipment will be sufficient to meet this requirement.

8. Access to Void Spaces

Access to Void Spaces (46 CFR 153.217) and Cargo Tank Access (46 CFR 153.254).

a. General. Different criteria apparently have been applied in several cases to distinguish an access opening and an access trunk to a cargo tank or void space. For example, access openings to void spaces and cargo tanks having 24-inch high coamings are not considered to be access trunks under 46 CFR 153.254(d). Access trunks are larger to account for internal projections, such as side-mounted ladders, that decrease the effective cross-sectional area of the opening. Whether or not an access opening to a cargo tank or void space is considered as an access trunk depends upon the placement of mounted ladders and the resultant cross-sectional area.

b. Access Requirements. Horizontal access openings (e.g., hatches and manholes) must be of sufficient size to allow a person wearing a breathing apparatus to ascend or descend any ladder without obstruction. Minor relaxations of these standards will be permitted for existing vessels, if the existing horizontal access openings allow a person wearing a breathing apparatus to enter or leave a space freely. Enlarging an access opening to the dimensions required under 46 CFR 153.254, might impair the structural integrity of the tank or space. The intent of this section will be met if such an access opening is enlarged, as much as possible, without impairing the structural integrity of the space.

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9. Type II Containment Systems

➔ See paragraph F3.F.4 above concerning the damage stability requirements for existing vessels. (46 CFR 153.231(b))

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10. Fore and Aft Location

➔See paragraph F3.F.3 above. (46 CFR 153.234)

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11. Piping System Design (46 CFR 153.280)

Under 46 CFR 56.10-5(d), plastic pipe and fiber glass-reinforced plastic (FRP) pipe, such as "Bonstrand," shall not be used in transfer systems for flammable or combustible cargoes. Acceptable materials and specifications for piping systems are given in 46 CFR 56.60. The Commandant has recognized the need aboard parcel tankers to load relatively small quantities of hazardous cargoes, without using the usual manifold or pumproom arrangements. "Direct loading" with portable piping and hoses is considered a suitable alternative. When loading larger quantities (i.e., one cargo is loaded into more than two tanks), fixed piping is required. Direct loading through a fixed drop line or deep well pump stack from a portable piping system must comply with the following requirements:

a. All connections between hoses, pipes, fixed drop lines, and deep well pumps shall be made in accordance with 33 CFR 156.130. Any connection between hose or pipe sections that have a reduced portable containment below must have a tightened bolt in each hole of the flange to secure the connections.

b. After disconnection, pipes and hoses shall be drained and cleaned before removal from the containment area.

c. Not more than one "Y" piece may be used for each cargo loaded (i.e., not more than two tanks may be loaded with any one cargo using this method).

d. Hoses shall meet the requirements of 33 CFR 154.500 or 46 CFR 153.940, according to the cargo being transferred. A portable hose line may not consist of more than four sections, or exceed 100 feet in length.

e. Portable pipes must be constructed of materials in accordance with the requirements of 46 CFR 56.

f. When loading or discharging a cargo that is required by 46 CFR 153 to have closed or restricted gauging, the fixed drop line or deep well pump connection must have a stop valve. After transfer, the valve should be left in place, closed, and blanked.

12. Cargo Filling Lines

The cargo tank filling lines on existing vessels that terminate near the bottom of the tank will meet the intent of this provision, and do not warrant modification. (46 CFR 153.282)

13. Emergency Shutdown Stations

46 CFR 153.296(a) requires two emergency shutdown stations. Section 2.11.1 of the Chemical Code requires only that remote shutdown devices be installed for all cargo pumps and similar equipment (see paragraph F3.F.29 below).

14. Ventilation Standards and Rates

Ventilation Standards and Rates (46 CFR 153.312 and 316). See paragraph F3.F.3 above.

15. Hoisting Arrangements

The Chemical Code does not specify a minimum lifting capacity for the pumproom hoisting arrangement. Specifications prescribed by home administrations are acceptable for foreign vessels possessing COF's (see paragraph F3.F.29 below). (46 CFR 153.332)

16. Bilge Pumping

Bilge Pumping Systems (46 CFR 153.334(b)(2)). The Chemical Code does not require a bilge alarm in cargo pumprooms (see paragraph F3.F.29 below).

17. Venting System Outlets

This provision does not refer to flame screens. Additionally, the IMO Chemical Code does not contain specifications for mesh flame screens. Whenever foreign vessels carry flammable or combustible cargoes, flame screens must be installed in accordance with 46 CFR 30.10-25, 32.55-20, and 35.30-10. (46 CFR 153.352)

18. Venting System Flow Capacity

Section 2.13.2 of the Chemical Code has been revised to include the standards of 46 CFR 153.358. The pressure differential specified in the Code, however, is 20 kPa gauge (2.9 psig) in lieu of 28 kPa gauge (4.06 psig).

NOTE: The unit kPa equals 0.145 psi; see Appendix III to 46 CFR 153.

A COF is sufficient to document that a foreign vessel meets these requirements. (46 CFR 153.358)

19. Venting System Restriction

Rupture discs may be used in series with pressure-vacuum valves. (46 CFR 153.360)

20. Required Closed Gauges

Many foreign and U.S. parcel tankers use float type closed gauging devices as portable gauging equipment. Portable closed gauging is considered acceptable, in lieu of a permanent installation, provided the gauge manufacturer's installation and operating instructions are followed. Some float type gauges require the installation of guide wires to ensure proper operation; others have been designed so that guide wires are not necessary. The manufacturer's installation and operating manual shall be maintained aboard vessels equipped with these gauges for reference should a question arise over the need for guide wires. Documentation from the manufacturer confirming that gauges can be used without guide wires is required. 46 CFR 153.404(d) also contains specifications for cargo sampling systems (although it does not require such installations).

21. Heat Transfer Systems

Foreign vessels shall comply with the standards of their classification societies or home administrations (see paragraph F3.F.29 below). (46 CFR 153.430)

22. Heat Transfer Fluid

This requirement is intended to ensure that the heating medium and the cargo are compatible. Foreign vessels shall comply with section 2.15.2 of the Chemical Code, which is equivalent to this section. (46 CFR 153.436)

23. Cargo Pressure or Temperature Alarms

All foreign and U.S. vessels are required to meet either 46 CFR 153.438(a)(1) or (2) and 153.438(b). Section 2.15.5 of the Chemical Code refers only to a temperature measuring system.

> **NOTE:** Section 153.438(b) exceeds section 2.15.5 of the Code, which does not require an alarm on the bridge.

The temperature and pressure sensing arrangements required by this section must be independent of other temperature or pressure sensing arrangements, in accordance with 46 CFR 153.438(c). Under 46 CFR 153, alarms are required only for cooling systems, while IMO requires alarms if overcooling or overheating could result in a dangerous condition.

24. Inert Gas Systems

This section of the regulations is equivalent to section 2.19.3 of the Chemical Code with regard to inert gas generation (see paragraph F3.F.29 below). (46 CFR 153.500)

25. Special Requirements For Unusually Toxic Cargoes

46 CFR 153.525(c). There are major differences between this requirement and the IMO Chemical Code, which does not require pumps and valves for unusually toxic cargoes to be operable from the weather deck. Sections 2.10.4 and 4.13.3 of the Code address standards for pumps and valves, but do not impose a standard equivalent to 46 CFR 153.525(c) (see paragraph F3.F.29 below).

46 CFR 153.525(d). This requirement corresponds to section 2.15.6 of the Chemical Code. Its intent is to minimize the contamination of potable water, feedwater, other cargoes, and fuel by toxic cargoes.The most common heating system found on existing ships uses low-pressure steam, produced by the main propulsion boilers or by cargo-heating boilers located in the engineroom. Condensate drainage from the cargo tank heating coils is returned to the feedwater system by an inspection tank. Section 2.15.6(c) of the Code provides for this type of heating system. Although systems meeting 46 CFR 153.525(d)(1) or (2), or sections 2.15.6(a) or (b) of the Code, are preferable, the steam heating system previously described is acceptable, provided the heating coil drainage returns to an inspection tank located on deck, within the cargo containment area. The inspection tank must be fitted with a drain valve to facilitate sampling of returns for cargoes that are clear and soluble in water, and therefore virtually impossible to detect visually. If a vessel owner elects this or a similar system, the owner must demonstrate that the necessary safeguards have been incorporated in the design.

26. Toxic Vapor Detectors

Vapor detection equipment may be unavailable for some cargoes to which this regulation applies. If the required equipment is unavailable for a particular toxic cargo that is transferred through a pumproom, the requirements of 46 CFR 153.336(b) shall be applied. A vessel carrying a toxic cargo that is not piped through pumprooms, but rather through in-tank pumps, need not have the additional vapor detection equipment required by 46 CFR 153.336(b) (see paragraph F3.F.29 below). Questions concerning the commercial availability of toxic vapor detectors for specific cargoes should be directed to Commandant (G-MSE). (46 CFR 153.526)

F3. Special Requirements for Alkylene

Water spray requirements for propylene oxide are found in section 4.7.21 of the IMO Chemical Code. Under 46 CFR 153.530(p), the water spray system must operate automatically (section 4.7.21 of the Code does not require automatic operation of the water spray system). All foreign and U.S. vessels that handle alkylene oxides must comply with 46 CFR 153.530(p) (see paragraph F3.F.29 below).

28. Special Requirements for Acids

Litmus paper or similar indicators will satisfy these requirements. (46 CFR 153.554(c))

29. Examination for Letter of Compliance (LOC)

Foreign vessels shall be examined for compliance with the IMO Chemical Code. The following are the design and equipment requirements of 46 CFR 153 that must be met by foreign flag vessels even though the vessel possesses an IMO Chemical Code COF:

a. 46 CFR 153.370, 153.371, and 153.438 for a vessel transporting a cargo whose vapor pressure exceeds 100 kPa absolute at 37.8o C (See 153.9(a)(2) and MSM F3.F.23)).

b. 46 CFR 153.530 (b), (d) and (p)(1) for a vessel transporting alkylene oxides (See 153.9(a)(1) and MSM F3.F.F3).

The requirements of 46 CFR 153 Subpart C apply to all foreign flag vessels. For areas in which the Code's intent is unclear, 46 CFR 153 shall be used as guidance. Questions should be referred to Commandant (G-MOC). (46 CFR 153.808)

30. Certificate Endorse-ments

Before a U.S. vessel is permitted to carry a cargo listed in Table I of 46 CFR 153, the vessel must have either a Certificate of Inspection (COI) (Form CG-841) or a COI Amendment specifically endorsed for each cargo. The endorsement shall list each cargo by name and the cargo tank(s) in which carriage is permitted. Hull type classification must also be shown on the form as "TANKSHIP/HULL TYPE (I, II, or III, as appropriate)." (46 CFR 153.900(a))

31. Cargo Information Cards

Possible sources of cargo information include the shipper or manufacturer of the chemical, the CHRIS Manuals, and the I.C.S. Tanker Safety Guide. Printing may be done on both sides of the card. (46 CFR 153.907)

NOTE: 46 CFR 153.907 will be revised in future rulemaking to reflect this.

32. Protective Clothing Required

This requirement applies only to persons on the vessel forward of the after deckhouse, who are engaged in the jobs listed in 46 CFR 153.933. Therefore, this requirement would apply to terminal employees and personnel aboard the vessel, who are engaged in any of those tasks.

33. Entry Into Spaces

This section requires the master to ensure that personnel wear protective equipment with a self-contained breathing apparatus, if they enter cargo tanks, pumprooms, or void spaces that are not freed of toxic vapors, or that lack sufficient oxygen to support life. It applies to all cargoes listed in Table I of 46 CFR 153. (46 CFR 153.934(b))

34. Standards for Marking of Cargo Hose

These requirements apply only to cargo hoses used to transfer cargoes listed in Table I of 46 CFR 153 to or from a parcel tanker, including terminal hoses that are involved in the transfer of Table I cargoes (see paragraph F3.F.11 above). (46 CFR 153.940)

35. Connecting a Cargo Hose

This provision requires the person in charge of cargo transfer to use a hose that meets 46 CFR 153.940 requirements. (46 CFR 153.972)

36. Plugged Scuppers for Inorganic Acids (33 CFR 155.310)

This regulation requires deck scuppers to be plugged as a condition to approve or continue bulk liquid hazardous material cargo transfer operations. It had been suggested that this prohibition against open scuppers may be inappropriate for certain cargoes. For example, inorganic acids are considered very corrosive to ordinary ferrous metals and alloys. The spill or leak procedures cited in the Chemical Data Guide for Bulk Shipment by Water recommend that certain inorganic acids (e.g., phosphoric acid) be flushed with large amounts of water. Thus, the argument follows that if an inorganic acid spill occurred on deck and could not be washed off due to plugged scuppers, then the vessel's deck plating might be harmed.

a. Following careful consideration of the matter, it has been determined that the prohibition against open scuppers remains appropriate for inorganic acid carriers. Inorganic acids are considered noxious liquid substances (NLS) under MARPOL, Annex II (Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk). Annex II regulates the discharge of NLS according to their category of hazard classification. Discharge of even the least harmful NLS, Category D, is impermissible unless it has been diluted to a concentration of one part of the substance in ten parts of water. Therefore, scrupulous attention to duty during the cargo transfer process by cognizant personnel, in combination with the cargo discharge containment equipment required by 33 CFR 155.310(b)(3), are the primary means for protection from incidental spillage. Unplugged scuppers would potentially allow the release of spilled acid directly into a waterway before it could be adequately diluted.

b. Although inorganic acids do pose a corrosion hazard to ferrous materials, the potential for corrosion damage can be minimized by quickly diluting the spill, or neutralizing it with appropriate agents. In only the most catastrophic scenarios might an untreated spill remain on deck long enough to cause significant damage to a vessel's deck plating. On balance, the environmental consequences resulting from an inadequately diluted inorganic acid spill entering a waterway through open scuppers greatly exceed the threat of structural damage to the vessel.

c. Accordingly, the requirement to plug deck scuppers applies irrespective of the type of cargo being carried. In addition, although discharge of a diluted inorganic acid may be acceptable within the parameters established in MARPOL, Annex II, responsible personnel should bear in mind the obligation to comply with the hazardous material discharge reportable quantities criteria specified in 33 CFR, Subpart B.

G. CHEMICAL BARGES

1. General

The regulations for barges carrying certain bulk dangerous cargoes, 46 CFR 151, became effective on 1 June 1970. They required upgrading of existing barges not previously certificated under 46 CFR 36, 38, 39, 40, and 98. Operating requirements in 46 CFR 151 apply to all barges. The intent of the regulations is the same as that for ships; containment of products to a degree commensurate with their hazards. Barges carrying chemical products that are flammable or combustible are certificated under 46 CFR, Subchapter D (Tank Vessels). Those carrying only nonflammable products can be certificated under either Subchapter D or I (Cargo and Miscellaneous Vessels), at the owner's option. If the owner does not indicate a choice, the barge shall be certificated under Subchapter D. The COI is then endorsed for the carriage of specific cargoes under 46 CFR 151.

2. Barges

The barge regulations follow the same general format as for ships (i.e., general requirements for all chemical barges and a table of minimum and special requirements for individual products). Commandant (G-MSO) establishes tentative minimum requirements for new cargoes. The shipper, all district commanders (m), and the MSC are notified of these by letter.

3. Clarification

Since 46 CFR 151 was published, some problem areas in interpretation or application have arisen. To clarify these points, and to specifically address manned barges, a regulatory project has been initiated to revise 46 CFR 151. In the interim, questions involving manned barges or other areas open to interpretation in 46 CFR 151 should be referred to Commandant (G-MSO-3) at: 202-267-0103. Questions regarding minimum requirements for cargoes that are not listed in 46 CFR Table 151.05 should be referred to Commandant (G-MSO) at: 202-267-0214. An index for 46 CFR 151 is contained in Navigation and Vessel Inspection Circular (NVIC) 5-71.

H. COMPATIBILITY OF CARGOES (46 CFR 150, SUBPART A)

1. General

Cargo compatibility information is contained in 46 CFR 150, Subpart A, Compatibility of Cargoes. This subpart applies to all U.S. and foreign vessels subject to inspection. It gives a yes or no answer to the question of whether two chemical cargoes are compatible and, therefore, whether they may be carried in adjacent tanks. Mixing of incompatible chemicals in a tank or pipe may cause a chemical reaction that generates significant heat or gas which can be very hazardous to personnel and property. It is important to note that 46 CFR 150.150 allows the Commandant to grant exceptions to the compatibility chart, according to experimental data submitted to support exception requests.

2. Testing Procedures

Appendix III describes the test procedure to be followed by a shipper or manufacturer developing such data. 46 CFR 150.160 requires the operator of a vessel carrying a cargo excepted under 46 CFR 150.150, but not listed in Appendix I, Exceptions To The Chart, to:

a. Verify that Commandant (G-MSO) has authorized, by letter or message, the pairing of cargoes as an exception to the compatibility chart; and

b. Maintain a copy of the authorization letter or message aboard the vessel.

CHAPTER 3: CARRIAGE OF BULK LIQUID CHEMICALS

I. INSPECTION OF VESSELS CARRYING HAZARDOUS LIQUID CARGOES

1. Introduction

The numbers and varieties of unconventional, hazardous liquid cargoes being transported in bulk by water are steadily increasing. Although the transportation and inspection hazards of petroleum products are generally well understood, newer commodities often have unusual properties, e.g., wide flammability limits, low ignition temperatures, foam incompatibility, or increased toxicity and reactivity. Marine safety personnel should be aware of special circumstances that may be involved in the shipment of hazardous materials in the marine environment.

2. References Concerning Hazardous or Dangerous Cargoes

All marine safety personnel who inspect vessels carrying hazardous/dangerous cargoes in bulk shall become familiar with the chemical and physical properties of these products, and the requirements of 46 CFR 150, 151, 153, 154, and 154a. Chemical and physical property information can be obtained from the publications listed in paragraph F3.C.4 above.

3. Venting Systems Inspection

Venting Systems Inspection.

Solids Shipped in Molten Form (Sulphur, Phenol)

a. There are a number of products transported in tank vessels that may plug or coat flame screens and, in some instances, vent lines and pressure relief valves in cargo transfer piping. One such class of chemicals includes solids shipped in molten form, such as sulfur or phenol. Hot vapors from these molten materials rise and can condense and solidify in cooler vent pipes, vent lines, and flame screens. Plugged lines may eventually occur if such deposits are not cleaned when they build up. In severe cases, heating system trace lines may be necessary for cargo, relief, and vent lines.

Monomer Substances

b. Another class of chemicals causing similar problems are the monomers, i.e., styrene, ethyl acrylate, methyl methacrylate, and vinyl acetate. Although these substances are inhibited in the liquid phase to help prevent self-reaction, the vapors are uninhibited and may polymerize (i.e., form chains of macro-molecules from smaller, reactive molecules) on the walls of the vent lines and flame screens. Buildup can occur after several years of service, in some cases much faster. Overfilling of a tank or sloshing of product in the tank during a voyage can also deposit liquid in the horizontal runs of a vent system; the liquid will solidify after depletion of the inhibitor. Specialized inspection scopes have been devised which will allow detection of polymer deposits in vent lines and should be employed.

Caution During Inspections

c. Because of the potential problems of coated flame screens and blocked vent lines, these systems should be examined at each scheduled inspection to determine whether chemical buildup is occurring. Cleaning will be necessary if substantial coating is detected. Buildup caused by polymerization may be very difficult to remove, requiring special solvents, scraping, or exposure to high temperatures. The owner or operator should be advised that an active maintenance program is needed to maintain safety equipment against polymer buildup. Safety of personnel must also be considered. Toxic product vapors that condense or are heavier than air may fall to the deck and endanger personnel. In many cases, the first loading and discharge of toxic cargoes should be witnessed by Coast Guard personnel, to ensure that all recognizable factors of personnel safety have been considered in the design of the system.

Toxic Cargoes

d. The regulations of 46 CFR 151.50-5(e) require toxic cargo vapors from gravity type tanks to be controlled by using a pressure/vacuum (PV) valve. The minimum pressure setting of the PV valve is .21 kg/cm2 gauge (3 psig) but not to exceed the design pressure of the cargo tank. The intent of this requirement is to reduce the probability of the cargo tank venting during operations other than transfers. The minimum setting of the PV valve and design pressure of the cargo tank should not be less than .21 kg/cm2 gauge (3 psig). The installation of the proper PV valve should be verified for barges authorized to carry toxic cargoes in gravity type cargo tanks. The pressure and vacuum setting of this PV valve should be entered in the Marine Safety Information System (Vessel File Cargo System product set).

4. Carriage of Alkylene Oxides

Carriage of Alkylene Oxides.

General Concerns

a. General Concerns. The dangers presented by alkylene oxides, such as ethylene oxide or propylene oxide, are threefold:

(1) They present a severe explosion hazard;

(2) They are carried under a nitrogen pad because they polymerize in the atmosphere. Any residual cargo can react in this manner and foul piping and fittings; and

(3) They are highly reactive, and may not be compatible with the alternate cargo. Saturated hydrocarbons (e.g., propane, butane, pentane, hexane) present no compatibility problems. However, alkylene oxides can react violently, sometimes explosively, with acids, bases, alcohols, aldehydes, amines, and other compounds.

Tank Cleaning Standards

b. Tank Cleaning Standards. For the reasons cited above, the importance of thorough cleaning of alkylene oxide tanks cannot be overemphasized. Methods recommended for the satisfactory cleaning of such tanks are provided in NVIC 5-79, "Inerting and Tank Cleaning Procedures for Alkylene Oxide Containment Systems." Under 46 CFR 153.1011(a), tanks being taken out of propylene oxide service, or being returned to such service from carriage of other cargoes, must be cleaned to the satisfaction of the marine inspector. Prior to inspection, the inspector should be familiar with the procedures planned for cleaning a particular tank.

Alternate Cleaning Methods

c. Alternate Cleaning Methods. Proposed methods that differ from those outlined in NVIC 5-79 may be employed, provided they are consistent with good cleaning practices, as outlined by a recognized authority, such as the National Fire Protection Association (NFPA). In this regard, there should be no evidence of residue and a marine chemist certificate should be provided. When the cleaning is completed to the inspector's satisfaction and the tank is inerted, alkylene oxide may be loaded (See MSM II-A5 concerning the role of the marine chemist).

CHAPTER 4: CARRIAGE OF BULK LIQUID GASES

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CHAPTER 4: CARRIAGE OF BULK LIQUID GASES

A. GENERAL CONSIDERATIONS

1. Introduction

Like bulk liquid chemicals, bulk liquefied gases are evaluated for shipment according to their particular properties. The procedures outlined in MSM II F1 for evaluating new products and establishing minimum requirements are used. Liquefied gases have most of the same properties as liquid chemicals. Some gases, such as the alkanes (methane, ethane, propane, etc.), have flammability as their primary hazard. Others are nonflammable but highly toxic, such as chlorine and sulfur dioxide. Still others are corrosive, capable of polymerization, unstable, or are incompatible with common materials of construction. Some combinations of liquefied gases are incompatible; others require inhibition, as do liquid chemicals. Most gases carried in bulk are designated as "cargoes of particular hazard" in 33 CFR 126.10 because of their potential ability to cause damage over large areas.

2. Liquefaction Techniques

Economics dictate that when gases are carried in bulk, they be liquefied by compression, refrigeration, or both. Thus, they are carried in "unnatural" states, possessing tremendous amounts of potential energy. To contain them during carriage, the pressures or temperatures must be maintained. Under Coast Guard regulations, a cargo tank for gases must be able to withstand the vapor pressure of the cargo at 45°C or have reliquefaction equipment. The only exceptions to this rule are tanks that carry liquefied natural gas (LNG) (methane) or nitrogen.

> **NOTE:** Nitrogen is not currently carried as a cargo, but is carried as an inert gas.

Methane cannot be liquefied by pressure alone at temperatures above -82.2°C. Reliquefaction of methane is not currently practical on ships because very large refrigeration plants are required. Consequently, the boil-off vapors from LNG tanks are burned in the ship's boilers, in order to control temperature and pressure within the cargo tanks without venting to the atmosphere.

3. Determination of the Gaseous State

The breakpoint between liquids and gases for purposes of the regulations is somewhat arbitrary. In the past, the breakpoint has been a Reid vapor pressure (RVP) of 276 kilopascal (kPa) absolute (40 psia). However, when the International Maritime Organization (IMO) developed its Gas Code, certain products with RVP's below 276 kPa absolute were included. The Coast Guard regulations for gas ships now apply to cargoes with an RVP of 172 kPa absolute (25 psia) or higher. This figure includes the products that the IMO has included in its Gas Code. The IMO Code has also been amended to allow the carriage of seven high vapor pressure chemicals previously allowed only on chemical tankers: propylene oxide, isoprene, isopropylamine, diethyl ether, monoethylamine, vinylethyl ether, and vinylidene chloride. All of these have an RVP between 101 and 172 kPa absolute. Although these products do not meet the definition of a liquefied gas, they have been considered for carriage on gas ships. Special requirements for their carriage are similar to those for chemical carriers. U.S. gas ship regulations will be revised in the future to include these products.

4. Addressing the Carriage of LNG

Much public attention has been centered on the hazards of LNG. The Coast Guard has consequently published a guide entitled Liquefied Natural Gas and Liquefied Petroleum Gas - Views and Practices, Policy and Safety, Commandant Instruction (COMDTINST) M16616.4. Ports that handle LNG ships have published contingency plans concerning LNG incidents. Although concern about LNG hazards is justified, it should be remembered that most other liquefied gases are just as dangerous as LNG, some even more so.

B. NEW GAS SHIPS

1. Introduction

"New" gas ships are defined under the IMO Gas Code for New Ships and 46 CFR 154 as ships contracted after 31 October 1976, having a keel laid after 31 December 1976, or delivered after 30 June 1980. Any ship, regardless of its age, that meets the standards of this Code may be issued a Certificate of Fitness (COF).

2. Containment of Cargo

The major difference between a gas ship and an ordinary tanker is the cargo containment system. Due to a wealth of available information about containment systems in use (mostly about LNG tanks), this is not discussed in detail here. Briefly, there are six types of tanks used on gas carriers:

Integral Gravity Tanks

a. Integral Gravity Tanks. These are similar to conventional tanks on ordinary tankers. They cannot be used for cargoes carried below -10°C without special approval, and are generally not approved for pressures above 24.5 kPa gauge (3.55 psig). As a result, they are rarely encountered on gas ships.

Membrane Tanks

b. Membrane Tanks. As the name implies, these are very thin-walled tanks. They are not self-supporting and they must have a full secondary barrier, essentially another tank surrounding the primary barrier. The primary and secondary barriers and the insulation are all supported by the inner hull of the vessel. These tanks are capable of withstanding very low pressures only, internally and externally. They are used primarily for carriage of LNG.

Semi-Membrane Tanks

c. Semi-Membrane Tanks. These are similar to membrane tanks. However, they are self-supporting when empty, and thus may be built apart from the ship's hull and subsequently lowered into it. They have not been widely used.

Independent Tanks

d. Independent Tanks. There are three types of independent self-supporting tanks, or tanks that can be built outside the ship's hull. They do not form part of the ship's hull and are not essential to hull strength.

Type A

(1) Type A. These are prismatic-shaped tanks having internal or external stiffeners. They are required to have secondary barriers, and are very common on gas ships.

Type B

(2) Type B. These tanks are very much like pressure vessels, except that the weight, rather than the vapor pressure, of the cargo is the predominant design parameter. Thus, they do not fully meet the design criteria for pressure vessels. However, their rounded forms are easier to analyze than Type A tanks. As a result, they are required only to have a partial secondary barrier, which is essentially an extremely large drip pan. The primary example of this type is the large spherical tank aboard an LNG ship. These tanks are designed to withstand about 207 kPa gauge (30 psig), although in practice the safety relief valves are set to relieve at pressures below 69 kPa gauge (10 psig).

Type C

(3) Type C. True pressure vessels, these are very common in gas ships other than LNG carriers. They may or may not be refrigerated and insulated, and no secondary barrier is required.

3. Regulatory Safety Factors

All tank types except Type C independent tanks are heavily instrumented, with gas detection equipment in the hold and interbarrier spaces, temperature sensors, and pressure gauges. Hold spaces for tanks other than Types B and C must be inerted if the cargo is flammable. Hold spaces for Type B tanks or refrigerated Type C tanks may be filled with dry air (with a dew point of -45°C or lower); ships with Type B tanks must be capable of inerting the largest hold space rapidly if a leak is detected. 46 CFR 154 requires higher safety standards than does the IMO Gas Code, as outlined in the following subparagraphs:

Design of Type B and C Tanks

a. Design of Type B and C Tanks. Type B and C tanks must be designed with an allowable stress factor of A = 4.0. The Code makes provisions for indicating compliance with the U.S. standard by listing the allowable stress factors on the COF. U.S. and foreign vessels must meet this standard.

NOTE: The IMO Gas Code permits the use of an A = 3.0 factor for some materials.

Design Ambient Temperatures

b. Design Ambient Temperatures. Except for vessels with independent Type C tanks, the regulations require the use of lower ambient design temperatures than does the Code. The design temperatures must be shown on the COF. A foreign ship will not be issued a Letter of Compliance (LOC) if it has not met the U.S. standard.

Cargo Tank Pressure/Temperature Control

c. Cargo Tank Pressure/Temperature Control. As explained in chapter 26 of this volume, the regulations do not permit the options of the IMO Gas Code for controlling cargo temperature and pressure by periodic venting or operational restrictions on voyage length or locale. Commandant (G-MTH-1) verifies that Coast Guard requirements are met, based on special classification society certification.

Enhanced Steel Grades

d. Enhanced Steel Grades. Under 46 CFR 154, enhanced grades of steel are required for crack arresting purposes at the sheer strake, deck stringer, and bilge strake. The rules of some classification societies permit the construction of large LNG carriers with the entire outer shell made of Grade A steel. No strakes of material having enhanced notch toughness properties, to act as crack arresters, would be required. Because of possible crack initiation from a spill of cryogenic liquid, the Coast Guard requires enhanced grades of steel with enhanced crack arresting properties in the sheer strake, the deck stringer, and the bilge strake. This requirement must also be met for LOC gas ships (there is no indication of this on the COF). Commandant (G-MTH-1) verifies that crack arresting steels have been used before accepting an LOC application, by requiring appropriate classification society certification.

4. Relationship Between Regulations and the IMO Gas Code

General

a. General. Other than specifying operating requirements and the higher standards described above, the regulations follow the IMO Gas Code as closely as possible. In fact, the regulatory sections were numbered to correspond to the chapters of the Code (e.g., the regulations numbered 154.900 correspond to Chapter IX of the Code). Because of the similarity, a valid IMO COF issued under the Gas Code for New Ships is generally accepted by the Coast Guard as evidence of compliance with all of 46 CFR 154, other than the special standards listed in B.3 above. The regulations contain certain operating requirements in addition to those in the Code, namely Subpart E of 46 CFR 154. These are applicable to foreign vessels, except as indicated.

Certification of Compliance with Requirements

b. Certification of Compliance with Requirements. Since a U.S. gas ship that meets 46 CFR 154 requirements will also meet the requirements of the IMO Gas Code, the officer in charge, marine inspection (OCMI) may issue the vessel a COF; the information needed to complete the COF shall be supplied by the Marine Safety Center (MSC). It is not mandatory for a U.S. ship to have a COF, but the owner will probably request one. Liquefied gas ships are certificated under 46 CFR, Subchapter D (Tank Vessels), and endorsed to carry specific cargoes under 46 CFR 154 (Subchapter O). New gas ships may also be certificated to carry liquid chemicals under 46 CFR 153. They must, however, meet all requirements of Part 153 for such certification.

C. EXISTING GAS SHIPS

1. Criteria for Designation

Every gas ship that does not meet the "new" ship definition in 46 CFR 154 is an "existing" gas ship. It is recognized that many of the gas ships that will be active for the next several decades were under construction or already contracted for at the inception of the Gas Code for New Ships. Although the Gas Code does not strictly apply to these vessels, IMO urges all governments to apply the New Ship standards as far as reasonable and practicable, considering their stage of construction at the time of the Code's inception. This was done by IMO Resolution A.329(IX). These vessels are issued an IMO A.329(IX) Certificate, which indicates that they meet the Gas Code for New Ships, except for the items listed in an enclosure to the A.329 COF. For convenience and common reference, these vessels have been dubbed "A.329 ships." A second category of existing gas ships includes those that were in service at the time the IMO Gas Code was written. Major changes to these vessels were not envisioned or required, in view of the excellent safety record of gas ships. However, some upgrading of existing ships, particularly in firefighting equipment, has been required. IMO developed another code, the Existing Ship Code, to specifically address these ships. The required upgradings were included in this Code, and compliance was required on a 2 or 6 year schedule, depending upon the extent of modification necessary for each specific upgrade. Since the Existing Ship Code was adopted in 1975, all upgrades, including those with a 6-year lead time, are now in force.

2. Upgrading Standards

The first few LNG ships built for U.S. registry are in the "A.329" category, and are treated in accordance with Resolution A.329(IX). Their COF's carry a few endorsements listing areas not in compliance with the New Ship Code, Resolution A.328(IX). IMO Resolution A.329(IX) requires that these ships comply in full with the Existing Ship Code. The Coast Guard is not adopting the Existing Ship Code in full, since some of its standards are lower than those traditionally required under U.S. regulations and the LOC Program. However, existing gas ships may be required by a future revision to 46 CFR Part 154 to meet all the upgrading requirements specified by the Code. Additionally, the regulations, when amended, will detail the procedures and certification necessary for issuance and renewal of the LOC for existing vessels. It is envisioned that LOC vessels will be required to possess a COF prior to reissuance of an expired LOC. At the present time, 46 CFR 38 should be used as guidance for examinations of existing gas ships holding LOC's. In cases where a COF issued under the Code for Existing Ships was used in part by Commandant (G-MTH-1) for acceptance of a vessel, that Code should also be used for guidance during an LOC examination.

D. BARGES CARRYING LIQUEFIED GASES

1. Introduction

The regulations for barges carrying liquefied gases whose primary hazard is flammability (e.g., the alkanes and alkenes) are found in 46 CFR 38. Those for barges carrying liquefied gases with different or additional hazards are found in 46 CFR 151. The latter group includes ammonia, chlorine, butadiene, and vinyl chloride.

2. Chlorine Barges

Chlorine, which may not be carried on ships in the U.S., has been carried for many years in barges. Because of its extremely dangerous nature, barges carrying chlorine are handled somewhat differently than most gas barges. Existing barges, acceptance of which was grandfathered under 46 CFR 151, have had wing tanks installed to attain added flotation. These have been dubbed "Type 1-S" barges. Due to the unique operating procedures for chlorine transfer, the Commandant has allowed the quick-closing, remote-activated valves required by 46 CFR 151 to be kept ashore when not in use. This arrangement is possible because the chlorine industry, for the most part, uses standardized fittings so that fit-up is not a problem. The valves may be under the control of a tankerman located ashore, as no one is normally on the barge during transfer. If personnel are on the barge during transfer operations (but not during fit-up of hoses, etc.), at least one remote shutdown valve shall be on the barge.

3. LNG Barges

To date, only one LNG barge has been built; it is presently not in LNG service. LNG barge designs are unique since they can neither refrigerate the cargo nor contain the vapor pressure of the cargo at 45°C, as barges carrying other gases are required to do. To ensure that LNG vapors are not vented under normal conditions, LNG barges must contain the boil-off for twice the voyage length or 45 days, whichever is greater.

4. Liquefied Hydrogen and Oxygen Barges

Currently, liquefied hydrogen and liquefied oxygen have been shipped by the National Aeronautics and Space Administration (NASA) exclusively on barges operated as public vessels. No commercial barges have been approved to carry these cargoes.

CHAPTER 5: OTHER HAZARDOUS MATERIALS CONCERNS

TABLE OF CONTENTS

A. LETTER OF COMPLIANCE (LOC) WITH SUBCHAPTER O ENDORSEMENT PROGRAM

1. Introduction

In the early 1960's, it was recognized that most bulk dangerous cargoes were being carried on foreign vessels. The 1960 International Convention for the Safety of Life at Sea (SOLAS) and the regulations in 46 CFR, Subchapter D did not adequately address these ships. Accordingly, an LOC Program was established to ensure the safe operation of these vessels. The LOC Program did not address aspects of ship design and equipment, but was limited to the integrity and operation of the cargo containment section of the vessel and related systems such as fire fighting equipment. Lifeboats, engine rooms, accommodations, and pollution prevention requirements were handled separately. This separation of functions led to some confusion on the part of ship owners and operators, and Coast Guard inspectors. Masters were issued an LOC from the Commandant, a letter affirming their compliance with pollution prevention regulations (sometimes referred to as a "letter of compliance") from the officer in charge, marine inspection (OCMI), and a Tank Vessel Safety Letter. Not only were there different documents issued, but the vessels were often examined by several different Coast Guard boarding teams in the same port. To eliminate such redundancies, a revised LOC Program was adopted by the Commandant on 16 February 1978. Current aspects of this Program are detailed in the discussion of the Subchapter O endorsement to the LOC in section MSM II, D6.E. Figure F5-1 lists the regulations pertaining to and documents required by foreign tank vessels entering U.S. waters.

2. International Maritime Organization (IMO) Codes and Certificates

Program Rationale

a. Program Rationale. The IMO Codes described in MSM II, F1 have permitted the termination of Coast Guard plan review for most foreign vessels. This does not mean, however, that the LOC Program has been abandoned. Because IMO Certificates of Fitness (COF's) may be issued erroneously, and because some special U.S. requirements exceed IMO standards, the Program remains necessary. In addition, the LOC is a vehicle for maintaining control over these vessels and ensuring compliance with the safety standards set down by IMO. It should be remembered that IMO Codes are recommendations, and are viewed by some administrations as strictly voluntary. Waivers, dispensations, and exemptions are common. If the standard of safety initially established by the LOC Program is not to be undermined, some control is necessary. Because plan review is no longer conducted for most vessels, effective examination of vessels for issuance of an LOC has become more important. Codes, regulations, plan reviews, and certificates, no matter how well drafted and executed, will not replace a thorough examination. This is the primary reason for issuance of LOC's by the OCMI, rather than the Commandant.

Requirements for Certification

b. Requirements for Certification. Some foreign shipowners have continued to seek an LOC based on plan review, rather than possession of an IMO COF. To eliminate this practice, and to have other administrations assume greater responsibility for their ships, the possession of an IMO Certificate is becoming mandatory. Under 46 CFR 153, a foreign chemical tanker must have a valid COF to obtain an LOC; the same requirement applies to new liquefied gas ships under 46 CFR 154. At present, existing gas ships are not required to possess a COF and may apply for an LOC under Coast Guard plan review. Similarly, LOC's previously issued to existing gas ships based on plan review remain acceptable on that basis. In practice, many gas ships now applying for LOC's submit IMO certification that documents areas of compliance and noncompliance with the Gas Codes for New and Existing Ships. In many cases, this eliminates the need for plan review. When the standards in the IMO Gas Code for Existing Ships are adopted into U.S. regulations, all existing gas ships will be required to possess a COF to obtain an LOC.

NOTE: Because some administrations do not issue IMO COF's, their ships will not be able to obtain them. Such vessels shall be examined as though they were U.S. vessels.

FIGURE F5-1:
APPLICABLE REGULATIONS AND REQUIRED DOCUMENTS FOR FOREIGN-FLAG TANK VESSELS ENTERING U.S. WATERS

	Chemical / Liquified Gas Unmanned Barges	Chemical Tankships	New Gas Carriers[1]	Existing Gas Carriers[1]
Coast Guard Regulations	46 CFR 151 46 CFR 30-40 or 46 CFR 90-109	SOLAS[2] 33 CFR 155, 159, and 164 46 CFR 153	SOLAS[2] 33 CFR 155, 159, and 164 46 CFR 154	SOLAS[2] 33 CFR 155, 159, and 164 46 CFR 38
IMO Codes	None	Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Res. A.212(VII) (IMO Chemical Code)	Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, Res. A.328(IX) (IMO Gas Code for New Ships)	IMO Code for Existing Ships Carrying Liquefied Gases in Bulk, or Recommendations Concerning Ships not covered by the Gas Code for New Ships, Res. A.329(IX)
Documents	(a) Letter of Compliance (Issued by USCG)	(a) Letter of Compliance (Issued by USCG) (b) Cert. of Fitness[3] (c) Comms. Cert.[4] (d) Safety Equip. Cert. (e) Safety Constr. Cert. (f) Load Line Cert.	(a) Letter of Compliance (Issued by USCG) (b) Cert. of Fitness[3] (c) Comms. Cert.[4] (d) Safety Equip. Cert. (e) Safety Constr. Cert. (f) Load Line Cert.	(a) Letter of Compliance (Issued by USCG) (b) n/a (c) Comms. Cert.[4] (d) Safety Equip. Cert. (e) Safety Constr. Cert. (f) Load Line Cert.

Notes: [1] *See 46 CFR 154.1 for definitions.*

[2] *A foreign flag vessel whose flag administration is not signatory to SOLAS must meet the requirements of 46 CFR, Subchapter D.*

[3] *A foreign flag vessel whose flag administration issues an IMO Certificate of Fitness must have one.*

[4] *Radiotelephony and Radiotelegraphy Certificates.*

3. Sequence of Determinations

To identify regulations concerning hazardous liquids and gases carried in bulk that are applicable to a given vessel and cargo, a "decision tree" is provided in Figure F5-2. The user should start from the left side and gradually work to the right by answering the questions "yes" or "no" to identify the regulation(s) applicable to a particular vessel.

B. CARRIAGE OF BULK HAZARDOUS SOLIDS

1. General Procedures

The requirements for marine shipment of bulk hazardous solids are found in 46 CFR 148 (Solids in Bulk). Products that may be shipped in bulk are listed in 46 CFR 148.01-7; the properties of a material that make it hazardous are briefly described in Table 46 CFR 148.01-7(a). These regulations are somewhat similar to the bulk liquid regulations (46 CFR 153), in that they provide general requirements for all hazardous solid cargoes and special requirements for individual materials. However, there is an important difference between the bulk liquid and bulk solid rules that is not readily apparent; under 46 CFR 148.01-9, an unlisted cargo may not be transported without permission of Commandant (G-MTH-1). Although this appears to duplicate the rules for bulk liquids, it applies only if the shipper determines that the material meets the definition of a "hazardous material" in 49 CFR 171.8. If the material meets this definition and is not listed by name in Table 46 CFR 148.01-7, Commandant (G-MTH-1) will review the properties of the material. If the material can be safely transported in bulk, a special permit describing the procedures and handling requirements for the shipment of the material will be issued. This special permit must be maintained aboard the vessel whenever the hazardous material is being moved. Special permits are given expiration dates, usually 2 years from the date of issuance.

2. Communications with Headquarters

Since there are relatively few materials listed in 46 CFR 148, most bulk solid cargoes are shipped under special permit or do not meet the definition of a hazardous material in 49 CFR 171.8. When in doubt about a particular cargo, Commandant (G-MTH-1) should be contacted at 202-267-1217.

C. CARRIAGE OF INTERMODAL PACKAGES AND PORTABLE TANKS

1. Introduction

The Office of Hazardous Materials Transportation (OHMT), Department of Transportation (DOT), has authority for the regulation of packaged shipment of hazardous materials. The regulations for "packaged" hazardous materials (49 CFR, Subchapter C) pertain to any material that is loaded and offloaded in an intact container (drum, box, portable tank, barrel, tank truck, or railroad tank car). The Coast Guard has the responsibility to enforce the "package regulations" on vessels. It may not issue, amend, or waive them, or issue exemptions to them under 49 CFR 107. However, there are provisions for "approvals" that can be exercised by the Coast Guard. Some of these approvals are issued by the Commandant (see 49 CFR 176.76(a) and 176.340), and others by the district commander (see 49 CFR 176.88). The captain of the port (COTP) can also approve alternative stowage procedures under 49 CFR 176.65. As these approvals are provided for in the regulations, they are not considered "exemptions."

2. Exemption Procedures

These are contained in 49 CFR 107. Although exemptions must be issued by the OHMT, the Coast Guard is consulted if the shipment involves marine transportation. There is also provision for emergency exemption in the case of severe economic loss or threat to life. In such a case, the shipper shall be directed to contact Commandant (G-MTH-1), which will forward the request to the OHMT. If a shipment is being made under the provisions of an OHMT exemption, the shipper must indicate the exemption number on all shipping papers and attach a copy of the exemption to the shipping papers.

3. Application of Regulations

IMO & DOT Classification and Labeling

General

a. IMO Classification and Labeling, with Corresponding DOT Classification for Shipment by Other Modes of Transportation (49 CFR 171.12(b)).

(1) General. Under 171.12(b) and (f), shippers may offer hazardous materials (except Class A and Class B explosives or radioactive materials) for import or export shipment if any portion of the transportation is by vessel between points in a state or between states, or if they are prepared in accordance with the Optional Hazardous Materials Table in 49 CFR 172.102. The Optional Table is derived from the International Maritime Dangerous Goods (IMDG) Code. The intent of this option is to facilitate the shipment of hazardous materials in international trade. Accordingly, a shipper may offer a hazardous material for transportation by any mode under the proper shipping name, classification, and label specified by the Optional Table, provided:

(a) The shipper includes in the description of the hazardous material (on the shipping documentation) the name of the DOT class most closely corresponding to the material's IMO class.

(b) The material is otherwise offered in accordance with the DOT regulations.

(c) Column 1 of the Optional Hazardous Material Table does not contain the letter "N." The letter "N" means that the entry is not an acceptable alternative and the material must be transported under the appropriate entry in 172.101.

NOTE: When a shipper elects this option, the shipper is, in effect, reclassifying the material in accordance with the IMDG Code. Therefore, those DOT requirements imposed on the material according to its class (such as placarding and segregation) shall be those of the DOT class most closely corresponding to the IMO classification of the material (e.g., IMO Class 4.3, DOT Class Flammable Solid). All other provisions for shipment of the hazardous material shall be as required by the DOT regulations.

Exemption from Coast Guard Control

(2) Exemption from Coast Guard Control. Materials that are listed in the IMDG Code, but not regulated by DOT, are not subject to Subchapter C, and are therefore exempt from Coast Guard enforcement action. To eliminate confusion in transporting such materials, shippers should be encouraged to include a notation on the shipping papers that the material is considered regulated under the IMDG Code only.

Example

(3) Example. As an example, triisobutyl aluminum would be shipped domestically as "Pyrophoric liquid, n.o.s. (triisobutyl aluminum), flammable liquid, UN 2845." For import or export, under the provisions of 49 CFR 171.12(b), 172.102, 172.201(a)(4)(i), and 172.203(i)(2), it may be shipped as "Triisobutyl aluminum, flammable liquid, 4.2, UN 1930, spontaneously combustible." The package must have the "SPONTANEOUSLY COMBUSTIBLE" label affixed. The "FLAMMABLE LIQUID" label may also be affixed, as provided by 49 CFR 172.401(a).

NOTE: Placarding for IMO is accomplished with an enlarged "SPONTANEOUSLY COMBUSTIBLE" label. However, the "FLAMMABLE" placard may be used for domestic transportation; the IMO placard may also be affixed.

Transportation by Water Outside the U.S.

b. Transportation by Water Outside the U.S. (49 CFR 172.203(i)(2)), And Shipments By Water (49 CFR 172.302(b)). When a mixture contains more than one material classed as a hazardous material, the technical name required in parentheses is the name of the constituent that is of the same hazard class as the total mixture. In addition, if the mixture is labeled with any subsidiary labels, the technical name of the material that compels the use of the subsidiary label must also be shown. When a mixture contains more than one material of the same hazard class, which results in that class or label being applied, only the technical name of the material that is the predominant reason for the class of label must be shown. When a mixture contains more than one material of the same hazard class in approximately the same percentages, only the name of the material with the highest level of hazard in the class (e.g., lowest flashpoint, most toxicity, etc.) need be shown.

Shipper's Certification

c. Shipper's Certification: See 49 CFR 172.204.

Carriage to the Marine Terminal

(1) Carriage to the Marine Terminal. The highway common carrier, regardless of whether or not it is the initial carrier, must tender shipping papers to the marine terminal. 49 CFR 171.2 provides that "no person may offer or accept a hazardous material for transportation . . . unless that material is properly classed, described, packaged, marked, labeled, and in the condition for shipment as required by this subchapter." In addition, 49 CFR 177.817(a) states that "a carrier may not transport a hazardous material unless it is accompanied by a shipping paper that is prepared in accordance with Sections 172.201, 172.202, and 172.203 . . ." Intermediate or interline motor carriers must accurately transfer from the original shipping papers all of the information required by 49 CFR 172.201, 172.202, and 172.203 (see 49 CFR 177.817).

Marine Shipment

(2) Marine Shipment. The marine carrier may not transport hazardous materials without a certificate prepared in accordance with 49 CFR 172.204. As the shipping papers presented by the interline motor carrier are not required to include this certificate, the marine carrier must obtain the shipper's certification from the shipper or the shipper's authorized representative. In many cases, the shipper satisfies this requirement by preparing a "dock receipt," which the shipper certifies and forwards to the carrier in advance of the shipment. In other cases, arrangements are made with motor carriers to provide a copy of a certified shipping paper when the shipment is delivered to the pier. In any event, it must be reemphasized that this certification is the responsibility of the shipper. A preprinted signature on the shipping document is not authorized, because it is made before the applicable conditions and acts have come into existence.

Reuse of Packaging

d. Reuse of Packaging (49 CFR 173.28). Many hazardous materials packagings of a durable nature are reused after fulfilling their initial purpose, either for shipment of other materials or for uses not related to commercial transportation. Several restrictions and requirements are placed on the reuse of packagings by 49 CFR 173.28. Among these is a requirement that all old hazardous materials markings and labels be thoroughly removed or obliterated before the packaging is used for other materials. In addition, an empty packaging bearing hazardous materials markings or labels is prohibited from being offered for transportation (except under certain specified conditions) by 49 CFR 173.29(d) unless it contains some of the hazardous material for which the markings are required. These restrictions apply even if the packaging is used for purposes other than transportation in the traditional sense. The act of offering such a package for sale is considered to be offering it for transportation.

Consumer Commodities

e. Consumer Commodities (49 CFR 173.1200). Packages complying with these requirements may be combined in a strong overpack whose gross weight exceeds 65 pounds. The overpack, when marked in accordance with 49 CFR 173.25, can be shipped as a "consumer commodity." The 65-pound limitation is intended to limit the weight of individual inside packages, not the additional overpack (not required by 173.1200).

Interchangeability of IMO and DOT Requirements

f. Interchangeability of IMO and DOT Requirements (49 CFR 176.11(a)). Hazardous materials, except Class A and B explosives and radioactive materials, may be accepted for transportation by vessel when in conformance with the IMDG Code pertaining to packaging, marking, labeling, classification, description, certification, and placarding. All hazardous materials must otherwise be stowed and carried in accordance with 49 CFR, Subchapter C. Differences in the stowage and segregation requirements of the DOT and IMO regulations are generally minor, and may be handled by the COTP through approval of alternate stowage procedures authorized by 49 CFR 176.65. The word "may" indicates the optional nature of such authorization. For example, if a hazardous material is packaged in accordance with DOT but is described, labeled, etc., in accordance with the IMDG Code, it is acceptable for marine shipment.

Motor Vehicles and their Equipment

g. Motor Vehicles and their Equipment (49 CFR 176.905(1)). The term "equipment" includes any devices related to the functioning of a motor vehicle or other mechanized equipment. Each item will be considered on an individual basis, with the following general exceptions. Fire extinguishers are considered related to the functioning of vehicles in which they are carried, because of their application against fires originating in those vehicles. By the same reasoning, tire inflators placed in vehicles also are directly related to their functioning.

NOTE: This interpretation cannot be given to oxygen tanks, which are not used directly in association with operation of the vehicle.

Motor vehicles themselves may be shipped as non-hazardous cargo, provided:

(1) Their fuel tanks are emptied;

(2) Their engines are run until they stall for lack of fuel;

(3) Their battery cables are disconnected; and

(4) No hazardous materials are stored in them.

NOTE: Residual amounts of fuel left in vehicle tanks are acceptable; stringent enforcement measures, such as the use of listening tubes, are not required for determination that a tank is "empty."

4 Intermodal Portable Tanks

A "portable tank" is a container having a capacity of more than 110 U.S. gallons, which is designed to be loaded into or on, or temporarily attached to, a transporting vehicle or vessel. It may be equipped with skids, lifting lugs, or intermodal container corner castings to facilitate handling. Certain DOT and Coast Guard specification portable tanks are explicitly authorized by Subchapter C for the carriage of particular regulated commodities. When a regulated commodity is shipped in such a tank, the marking, labeling, and placarding requirements of 49 CFR 172 apply. Non-specification portable tanks may also be used to transport regulated commodities when authorized by OHMT exemption, or a Coast Guard Letter of Authorization for combustible liquids (see 49 CFR 176.340). When inspecting a portable tank carrying a regulated commodity, the inspector should be alert to the following items:

a. Evidence of any leakage from valves, attachments, or safety relief devices;

b. Proof that hydrostatic testing has been performed within the prescribed period;

c. Evidence that all required inspections have been performed in a timely manner;

d. Evidence that securing and handling attachments are sound; and

e. Evidence of compliance with any special handling or stowage requirements that may be dictated by regulations or exemptions.

5. Radioactive Materials

Radioactive materials are regulated under Subchapter C as are other packaged hazardous materials. Particular requirements for shipments of radioactive materials are located in 49 CFR 173.401-478 and 176.700. The following pamphlets concerning radioactive materials have been published jointly by DOT and the Nuclear Regulatory Commission (NRC), and may be obtained from Commandant (G-MTH-1):

a. A Guide for the Inspection of Radioactive Material Shipments by Motor Vehicle or at Freight Facilities; and

b. A Review of the Department of Transportation (DOT) Regulations for Transportation of Radioactive Materials.

6. Liquid Materials Toxic by Inhalation

There are special requirements for certain poisonous materials, those liquids toxic by inhalation. While the originally published list included 36 materials, any material meeting the toxicity criteria found in 49 CFR 173.3a is subject to these requirements. The following materials are known to be toxic by inhalation:

- Acetone cyanohydrin*
- Acrolein, inhibited
- Allyl alcohol
- Allylamine*
- Bromine trifluoride
- n-Butyl isocyanate*
- Chlorine trifluoride
- Chloroacetonitrile*
- Chloropicrin
- Crotonaldehyde*
- Dimethylhydrazine, unsymmetrical
- Ethyl chloroformate
- Ethylene chlorohydrin*
- Ethyleneimine
- Ethyl isocyanate*
- Isopropyl chloroformate*
- Mesitylene
- Methacrylonitrile
- Methyl bromide
- Methyl chloroformate
- Methylchloromethyl ether
- Methylhydrazine
- Methyl isocyanate*
- Monochloroacetic acid, liquid
- Nickel carbonyl
- Nitric Acid, red fuming
- t-Octylmercaptan*
- Pentaborane
- Phosphorus oxychloride
- Phosphorus trichloride
- Propionitrile*
- n-Propyl chloroformate*
- Tetramethoxy silane*
- Tetranitromethane
- Titanium tetrachloride
- Trimethoxy silane*

All of these materials (in a packaging with a primary containment unit greater than 1 liter) must have "Poison-Inhalation Hazard" as a shipping paper description (49 CFR 172.203(k)(4)). The package (primary containment unit greater than 1 liter, packaging less than 110 gallons) must also be marked "Inhalation Hazard" (49 CFR 172.301(a)). Furthermore, the packages must be labelled and placarded as poisons. In addition, those materials with an asterisk (*) preceding the commodity name are shipped as "not otherwise specified" (n.o.s.) materials and must be transported in either a Poison A packaging or one approved by the Director, Office of Hazardous Materials Transportation (Research and Special Programs Administration (RSPA)). The approval is in the form of a letter and approval number. Poison A packaging are any appropriate packagings listed in the Poison A materials packaging sections, 49 CFR 173.328 through 173.337. Other packagings are approved on an individual basis.

D. CARRIAGE OF MARINE PORTABLE TANKS

Marine portable tanks (MPT's) are liquid-carrying containers that may be on or offloaded in a filled or empty condition, or filled and discharged while aboard a vessel, which are not permanently installed on the vessel. The regulations for use of these tanks are in 46 CFR 98.30. MPT's are limited to carriage of certain listed cargoes (see 46 CFR 64.9, 90.05-35, and 98.30-3). Authorization under 46 CFR 98.35 to carry combustible liquids aboard vessels in portable tanks constructed and inspected before 1 October 1974, was terminated on 1 October 1984.

NOTE: See MSM II, F2 for further information on MPT's.

E. CARRIAGE OF EXPLOSIVES

1. Commercial Explosives

Commercial explosives are shipped under 49 CFR, Chapter 1, Subchapter C as are other packaged hazardous materials. Shipments of Class A explosives in intermodal freight containers is permitted only by special approval of Commandant (G-MTH-1) (see paragraph E.3 below). The approval document specifies:

a. The condition of the containers (new or like new, with nonmetallic, non-sparking interiors, free of protrusions, etc.);

b. The handling equipment and sequence of operations to be employed; and

c. Stowage, segregation, and firefighting.

NOTE: All shipments of Class A explosives require COTP issued loading permits. Also, Class A and B explosives must be shipped under DOT regulations rather than IMO classification, even when they are shipped for export (see paragraph E.4 below relating to import shipments).

2. Military Explosives

General Requirements

a. General Requirements. Marine shipment of military explosives is regulated under 46 CFR 146. However, these regulations are closely tied to the commercial explosives regulations in 49 CFR, and reference is made in these regulations to the marking and labeling requirements of 49 CFR 172 and the exemption procedures of 49 CFR 107. All shipments of military explosives, except those assigned to Coast Guard Class I (see 46 CFR 146.29-13) and those carried aboard public vessels, require loading permits from the COTP. The COTP may authorize, in writing, alternate stowage or handling methods based on equivalent safety (see 46 CFR 146.02-25(b)). Most shipments of military explosives in intermodal freight containers must be approved by Commandant (G-MTH-1) in the same manner as are shipments of commercial explosives (see 46 CFR 146.29.11(a)(16)). All other deviations from transportation provisions provided for by rule must be in the form of an exemption and must be approved by the Director, Office of Hazardous Materials Transportation, DOT (see 46 CFR 146.02-25(a)).

NOTE: Commandant (G-MTH) recognizes the problems arising from the existence of three regulatory codes applying to the transport of explosives. A rulemaking project is nearing completion which will incorporate the military explosives requirements into 49 CFR 176. This project will also incorporate the United Nations' scheme for classification and segregation of all explosives (Commercial and military) for marine shipment, and should provide domestic and international harmony for all explosives.

Definition

b. Definition. "Military explosives" are explosive substances and devices shipped by, for, or to the following:

(1) Any department or agency of the U.S. Department of Defense; or

(2) The government of "any country whose defense is deemed vital to the defense of the United States."

The first of the above conditions is self-explanatory.

The second refers to a shipment of munitions or other explosives for which the U.S. State Department Office of Munitions Control has issued a "License for Export of Defense Articles" in accordance with 22 CFR 123 and 126. The State Department's policy is to deny licenses for the export of defense articles to countries or areas with respect to which the United States maintains an arms embargo, or "whenever an export would not otherwise be in furtherance of world peace and the security and foreign policy of the United States" (22 CFR 126.1).

Proper Shipping Name

c. Proper Shipping Name. The reference in 46 CFR 146.29-14(c)(4) to "true shipping name . . . specified in 146.29-100," is a regulatory anachronism which will be eliminated by the rulemaking action is effective, military explosives should be identified on the Dangerous Cargo Manifest by their DOT proper shipping name. The proper shipping name and hazard class of a military explosive is assigned to that explosive on the basis of an examination and tests by a laboratory recognized under 49 CFR 173.86 or 46 CFR 146.20-14, and approved by the Director, Office of Hazardous Materials Transportation or a DOD agency authorized to approve explosives under those sections. The proper shipping name to be used on the Dangerous Cargo Manifest should be the same as appears on the shipper's government bill of lading (GBL) or other shipping paper from which the manifest is compiled (46 CFR 146.05-12(a), 146.29-14(b)). It should also be as marked on the package. Two sources for proper shipping names assigned to military explosives are the following:

(1) Hazard Classification of United States Military Explosives and Hazardous Munitions, U.S. Army Defense Ammunition Center and School, Savanna, IL 61074-9639, October 1988.

(2) Navy Transportation Safety Handbook for Ammunition, Explosives and Related Materials, NAVSEA OP2165, Vol. 2, Commander, Naval Sea Systems Command, July 1986.

Compliance with Title 49 CFR or the IMDG Code

d. Compliance with Title 49 CFR or the IMDG Code. Whenever it is impracticable for a shipment of military explosives to comply with the handling, stowage, or segregation provisions of 46 CFR 146, the COTP may authorize alternative methods in writing (see 46 CFR 146.02-25). Compliance with the equivalent provisions of 49 CFR 176 or the IMDG Code is considered appropriate. Authorizations for alternative handling, stowage, or segregation should be limited to "one ship, one time," otherwise the shipper, carrier, or agent must obtain an exemption from the DOT Office of Hazardous Materials Transportation per 49 CFR 107, Subpart B. Although the COTP may authorize any alternative method that provides an equivalent level of safety, it is recommended that whenever 49 CFR or the IMDG Code is authorized, complete compliance with that code should be specified.

Classification of Military Explosives

e. Classification of Military Explosives. Figure F5-3 is a supplement to the Classification, Handling, and Stowage Chart in 46 CFR 146.29-100 which may be used by stowage planners and others to determine the Coast Guard stowage class of a military explosive when its DOT proper shipping name and hazard class are known. It is the responsibility of the shipper to determine the DOT proper shipping name, hazard class, and Coast Guard stowage class of military explosives. In most cases, this information may be readily obtained from the DOD Joint Hazard Classification System or various DOD manuals and Publications.

FIGURE F5-3:

COAST GUARD STOWAGE CLASSES OF MILITARY EXPLOSIVES

The purpose of Figure F5-3 is to serve as a link between the Department of Transportation Hazard Classification system in 49 CFR Chapter I, Subchapter C, and the Coast Guard Stowage Classification system in 46 CFR Subpart 146.29. This Figure lists alphabetically all the DOT authorized proper shipping names which apply to military explosives items. Using the shipping description from a shipper's incoming bill of lading or other shipping papers, a stowage planner may determine the stowage class applying to the item described. Each line entry contains a DOT proper shipping name, a DOT explosives class, and one or more applicable stowage classes. Where an entry lists more than one stowage class, the planner must have or obtain additional information concerning the construction or explosive composition of the particular item. For example, "Ammunition for cannon with smoke projectile" may fall into Class II-D, II-E, or II-F, depending whether its smoke making component is while phosphorus, hexachloroethane, sulfur trioxide/chloro-sulphonic acid, or titanium tetrachloride. When more than one stowage class is listed, the class definitions, descriptions, and examples in the chart, 46 CFR 146.29-100, should be consulted to determine the applicable stowage class.

DOT Proper Shipping Name	DOT Explosive Class	Coast Guard Stowage Class
Actuating cartridge, explosive	C	I
Ammunition, chemical, explosive with Poison A material	A	XI-A, XI-B
Ammunition, chemical, explosive with Poison B material	A	XI-A, XI-B
Ammunition, chemical, explosive with irritant material	A	XI-B
Ammunition for cannon with empty projectile	B	II-B
Ammunition for cannon with explosive projectile	A	IV
Ammunition for cannon with gas projectile	A	XI-A, XI-B
Ammunition for cannon with illuminating projectile	A	IV
Ammunition for cannon with incendiary projectile	A	IV
Ammunition for cannon with inert loaded projectile	B	II-b
Ammunition for cannon with smoke projectile	A	II-D, II-E, II-F
Ammunition for cannon with solid projectile	B	II-B
Ammunition for cannon with tear gas projectile	B	XI-B
Ammunition for small arms with explosive projectile	A	IV
Ammunition for small arms with incendiary projectile	A	IV
Black powder	A	IX-A
Black powder igniter with empty cartridge bag	C	I

Booster, explosive	A	VIII, X-A
Burster, explosive	C	X-A
Cannon primer	C	I, III
Cartridge bags, empty with black powder igniter	C	I
Cartridge, practice ammunition	C	I, II-B, II-C
Chemical ammunition, non-explosive (See NOTE A)	Irritant	XI-B
Chemical ammunition, non-explosive	Poison A	XI-A, XI-B
Chemical ammunition, non-explosive	Poison B	XI-A, XI-B
Combination fuse	C	III
Combination primer	C	I, III
Cord, detonating	A	I, VIII
Cord, detonating (See NOTE B)	C	I
Delay electric igniter	C	II-C
Detonating fuse, Class A explosive	A	VI, VIII
Detonating fuse, Class C explosive	C	I, III
Detonating primers, Class A explosive	A	VIII
Detonating primers, Class C explosive	C	III
Detonators, Class A explosive (See NOTE C)	A	VIII
Detonators Class C explosive	C	VIII
Electric squib	C	II-C
Empty cartridge bag with black powder igniter	C	I
Empty cartridge case, primed	C	I
Explosive bomb	A	II-E, II-G, II-J, VIII, X-A, X-B, XI-A, XI-B
Explosive cable cutter	C	I
Explosive mine	A	IV, VII, X-A, X-B, XI-A, XI-B
Explosive power device, Class B	B	II-B
Explosive power device, Class C	C	I
Explosive projectile (See NOTE D)	A	II-D, V, VII, X-A, X-B, XI-A, XI-B
Explosive release device	C	I
Explosive rivet	C	I
Explosive torpedo	A	X-A, X-B
Fireworks, common	C	II-C
Fireworks, special	B	II-B, II-C, II-D, II-E, II-G, II-J
Flexible linear shaped charge, metal clad	C	VIII
Fuse igniter	C	II-C
Fuse, instantaneous	C	II-C
Fuse lighter	C	I, II-C
Fuse mild detonating, metal-clad	C	III
Fuse safety	C	I
Fuze, combination	C	III
Fuze, detonating	A	VI, VIII
Fuze, detonating, Class C explosive	C	I
Fuze, detonating, radioactive	A	VI, VIII
Fuze, percussion	C	I, III, VIII
Fuze, time	C	I, III, VIII
Fuze, tracer	C	III

Grenade, empty primed	C	I
Grenade, hand or rifle, explosive	A	II-J, IV
Grenade, tear gas (See NOTE A)	Irritant	XI-B
Grenade (with incendiary material)	B	II-J
Grenade (with Poison A material)	Poison A	XI-A, XI-B
Grenade (with Poison B material)	Poison B	II-D, II-E, II-F
Grenade (with smoke charge)	C	II-D, II-E, II-F
Hand signal device	C	II-C
High explosive	A	IX-A, IX-B
High explosive liquid	A	IX-A, IX-B
Igniter	C	I, II-C, II-D, II-J
Igniter cord	C	I
Igniter, fuse, metal-clad	C	III
Igniter, jet thrust (JATO)	A	IX-A
Igniter, jet thrust (JATO)	B	III
Igniter, rocket motor	A	IX-A
Igniter, rocket motor	B	III
Initiating explosive	A	IX-C
Jet thrust unit	A	X-C
Jet thrust unit	B	II-B
Low explosive	A	IX-A
Percussion cap	C	I, III, VIII
Percussion fuze	C	I, III, VIII
Propellant explosive	A	II-A, IX-A
Propellant explosive in water	B	IX-A
Propellant explosive in water, unstable condemned, or deteriorated (See NOTE E)	B	IX-A
Propellant explosive, liquid	B	IX-A
Propellant explosive, solid	B	II-A, IX-A
Rocket ammunition with empty, inert or solid loaded projectile	A	II-B
Rocket ammunition with empty projectile	B	II-B
Rocket ammunition with explosive projectile	A	IV, X-C, X-D
Rocket ammunition with gas projectile	A	XI-A, XI-B
Rocket ammunition with illuminating projectile	A	IV
Rocket ammunition with incendiary projectile	A	IV
Rocket ammunition with inert loaded projectile	B	II-B
Rocket ammunition with smoke projectile	A	II-D, II-F
Rocket ammunition with solid projectile	B	I-B
Rocket engine, liquid	B	II-B, X-E
Rocket head	A	II-D, VII, X-A, X-B, XI-A, XI-B
Rocket motor	A	X-C
Rocket motor	B	II-C
Safety fuse	C	I
Safety squib	C	II-C
Signal flare	C	II-C
Small-arms ammunition	C	I

Small-arms ammunition (for personal care or household use) (See NOTE F)	ORM-D	I
Small-arms ammunition, irritating cartridge	C	I
Small-arms primer	C	I
Smoke candle	C	II-C, II-D, II-E, II-F
Smokeless powder for small-arms	Flam. Sld.	IX-A
Smoke pot	C	II-C, II-E
Smoke signal	C	II-C
Starter cartridge	B	II-A
Starter cartridge	C	I, II-C
Supplementary charge (explosive)	A	IX-B
Torpedo, railway	B	II-C
Tracer	C	II-C
Tracer fuze	C	III

NOTES:

A. The hazard class formerly identified as "Poison C" is now called "Irritating Material."

B. Replaces former description "Cordeau detonant."

C. Replaces former descriptions "Blasting caps," "Blasting caps with safety fuse," and Electric blasting caps."

D. The DOD source publications from which Figure 29-3 was compiled list no DOD ammunition items in Coast Guard Stowage Class V. However, such items may exist. If a DOD agency ships explosive projectiles containing "Explosive D" (ammonium picrate), CG Class V may be used.

E. The hazard of propellant explosive (smokeless powder) in water, even when "unstable, condemned, or deteriorated" is flammability, not mass detonation. Therefore, its DOT hazard class is properly Class B explosive.

F. Small arms ammunition, DOT Class C explosive, in the forms, quantities, and packagings specified in 49 CFR 173.1201, may be reclassified as "Consumer Commodity" (DOT Class ORM-D). Although no known DOD ammunition item is classed as ORM-D, it is possible that small arms ammunition so classed might be shipped on board a vessel with military explosives. When is the case, Coast Guard Class I applies for stowage purposes.

3. Commandant Approvals for Shipment of Explosives

The following information concerns approvals issued by Commandant (G-MTH) for equipment used in handling and transporting military and Class A explosives by cargo vessel, and other requirements for explosives.

a. The shipment of explosives by cargo vessel is regulated by 46 CFR 146 (military explosives) and 49 CFR 171-179 (all other types of explosives). The following provisions of these regulations authorize Commandant (G-MTH) to approve certain equipment used in handling or transporting military and Class A explosives:

(1) 46 CFR 146.29-42 and 49 CFR 176.76(a): Authorizes Commandant (G-MTH) to approve transport vehicles and freight containers for the transportation of military and Class A explosives.

(2) 49 CFR 176.78(d): Prohibits use of power-operated industrial trucks in holds and compartments containing explosives, unless approved by Commandant (G-MTH).

(3) 49 CFR 176.150(b): Authorizes Commandant (G-MTH) to approve the construction, handling, and stowage of portable magazines with capacity exceeding 110 cubic feet.

b. To implement the above regulations, Commandant (G-MTH) issues a document known as a "Commandant Coast Guard Approval" or CGA. This approval may be issued to a shipper, a carrier, or for an import shipment, a consignee. A person whose shipment of explosives would be affected by any of the above regulations should apply in writing or by Telex to Commandant (G-MTH), U.S. Coast Guard, Washington, DC 20593-0001 (Telex No. 892427) for an approval. The shipper should have a valid CGA in hand when applying for a permit to handle "designated dangerous cargo," i.e., military or Class A explosives, under 33 CFR 126.17 and 49 CFR 176.100. Figures F5-4 and F5-5 provide a sample CGA and a list of CGA's that are currently in effect.

c. CGA's issued since mid-1983 for the transportation of military or Class A explosives in freight containers and portable magazines have an open-ended expiration provision. Most CGA's for other purposes expire 2 years after their date of issue. The person or organization in whose name a CGA is issued may not transfer that CGA to another person or organization. If a company changes its name, address, or corporate affiliation, it must apply for a new or amended CGA.

d. Marine Safety Offices (MSO's) and COTP's should ensure that shippers, carriers, and others responsible for shipments of explosives are aware of the requirements concerning CGA's, and when a CGA is required, that the shipment is made in accordance with its terms.

FIGURE F5-4: SAMPLE COMMANDANT COAST GUARD APPROVAL NUMBER 012-85

In accordance with Title 49 Code of Federal Regulations, Subpart 176.76, and Title 46 Code of Federal Regulations, Subsection 146.29-11(c)(16), approval is hereby granted to Ewing Energy Corporation, 10000 Main Street, Dallas, TX 75240, for the shipment of Class A and military explosives in freight containers subject to the following conditions:

1. VESSELS: "Containership" or "Trailership" as defined in 49 CFR 171.8, or any "Cargo Vessel" as defined in 49 CFR 171.8 which has been specifically modified for the carriage of freight containers or can accommodate on deck stowage thereof.

2. PORTS: Any "Designated Waterfront Facility" as specified in 33 CFR 126.05(a), for which the captain of the port has issued the permit required in 33 CFR 126.17.

3. CONTAINERS: "Freight containers," as defined in 49 CFR 171.8, must meet the following physical requirements as determined by visual inspection. For a shipment entering the United States from a foreign country, Ewing Energy Corporation or their authorized agent must provide the captain of the port with a written certification that the containers meet these requirements.

a. Only closed freight containers may be used for the carriage of Class A and military explosives under the terms of this approval. Closed freight containers are defined as containers which totally enclose the contents by permanent structures. An open freight container which is covered by a tarpaulin or similar fabric or plastic cover is not considered a closed freight container.

b. Freight containers shall be clean enough, inside and out, to permit detailed inspection and ensure freedom from any residue of previous cargoes.

c. Freight containers shall be structurally sound and weathertight. Major defects in the main structural members that affect the structural integrity of the freight container are unacceptable. Main structural members consist of top and bottom side rails, top and bottom end rails, door sill and headers, corner posts, corner fittings, and floor crossmembers. Major defects are defined as holes, tears, fractures, or cracked or suspect welds. Dents or bends in a surface of main structural members exceeding 0.75 inch (19mm) in depth, regardless of length, are unacceptable. More than two splices per bottom or top side rail, more than one splice in the top or bottom end rail or door header, and any splice in the door sill or corner posts are unacceptable. Butt-welded, inset splices are the only acceptable repairs when splicing is permitted in main structural members. Dimensional distortion that does not permit proper engagement of lifting or tie-down devices is unacceptable.

d. There shall be no wastage of metal (or signs of wastage that may have been covered with paint or otherwise concealed) in any structural component. Deterioration in any component of a freight container, whether of ferrous or nonferrous material construction, such as rusted-out metal in sidewalls or disintegrated fiberglass, is unacceptable. Normal wear, including oxidation (rust), and minor damage that does not affect the structural integrity or weathertightness of the freight container are acceptable. Lap-welded or buck-riveted patches in the walls, roof, floor, and doors are acceptable if neatly made and weathertight and not affecting the structural integrity of the container.

FIGURE F5-4 (Cont.)

e. Each container must bear, in addition to a manufacturer's data plate, a CSC Safety Approval Plate; or, if in transportation between points within the United States as defined in 49 CFR 171.8, a decal or other certification showing that the container was built to, and met the requirements of, the International Convention for Safe Containers or the rules of a recognized classification society. These organizations are: American Bureau of Shipping; Germanischer Lloyd; Registro Italiano Navale; Nippon Kaiji Kyokai; Lloyd's Register of Industrial Services; Bureau Veritas; Det Norske Veritas; Register of Shipping of the USSR; and Polish Register of Shipping. A certification by a recognized inspection organization that is not listed here may also be acceptable and may be verified by Commandant (G-MTH-1), U.S. Coast Guard, phone 202-267-1577.

f. The interior of the container shall be a nonmetallic surface free of protrusions and nonsparking in nature. Floors shall be wood or wood-covered. Steel and aluminum containers shall be lined with a minimum of 1/4-inch plywood. Metal parts of fiberglass containers shall be covered with a minimum of 1/4-inch plywood. , All linings shall extend from the floor to the height of the lading or higher.

g. Cargo placed in each container shall be adequately blocked, braced, and secured in conformance with the requirements of 49 CFR 176.76(a)(2) and to the satisfaction of the captain of the port. [NOTE: Paragraphs 3(h) and 3(i) apply to Roll-On, Roll-Off service only.]

h. Each container used for the carriage of explosives in Roll-On, Roll-Off service shall be permanently attached to a chassis (i.e., a trailer vehicle) or secured to a container chassis specifically designed to accommodate freight containers. Freight containers on flat bed trailers are prohibited.

i. Closed van trailers manufactured and tested in accordance with Association of American Railroads (AAR) Specification No. M-931, and meeting the structural requirements contained in paragraph 3, excluding subparagraph 3(e), are authorized for the carriage of explosives and do not require a CSC Safety Approval Plate or a classification society decal.

4. INSPECTION:

a. For a shipment originating in the United States, the captain of the port or an authorized representative may inspect the loaded containers before they are placed on the vessel. Containers which exhibit defects or damage to any of the structural, supporting, or lifting components, or containers in which the lading is not properly secured, will not be permitted on board the vessel.

b. For a shipment entering the United States from a foreign nation, the captain of the port or an authorized representative may inspect the loaded containers before they are unloaded from the vessel. Containers which exhibit defects or damage to any of the structural, supporting, or lifting components, or containers in which the lading is not properly secured, may be prohibited from removal from the vessel.

FIGURE F5-4 (Cont.)

5. CARGO GEAR: Except in the case of an emergency, cargo gear which is used to load, off-load, or handle freight containers of explosives is limited to cargo gear which has been specifically designed or modified for the handling of freight containers. The Safe Working Load of the cargo gear shall be verified by a valid certificate issued by a recognized testing or regulatory agency. The Safe Working Load must be equivalent to or greater than the weight of the heaviest explosives-laden freight container to be transferred by such gear. Prior to the handling of any freight container loaded with explosives using ship's equipment, the master of the vessel or an authorized representative, or the Officer in Charge of a Coast Guard Explosives Loading Detail, if assigned, shall inspect the cargo gear to ensure that it is in safe working condition. In the case where shore-based equipment is used, the Terminal Operator or an authorized representative, or the Coast Guard Officer in Charge shall conduct the inspection to ensure that the cargo gear is in safe working condition. In the event that a valid certificate indicating the Safe Working Load for cargo gear is not available, or if any discrepancies are discovered in the inspection of the cargo gear, it must be dynamically tested with an inert proof load equivalent to at least 150 percent of the weight of the heaviest container to be transferred. In no case shall this 150 percent proof load exceed the weight of the proof load used in the prior certification of the cargo gear.

6. HANDLING: The handling of the containers of explosives during either loading or unloading operations must be scheduled such that the containers are moved in and out of the port area as quickly as possible. Storage of containers of explosives in the port area is not permitted except as specifically authorized by the captain of the port and the local port authority.

7. STOWAGE/SEGREGATION:

a. On containerships, containers of explosives may be stowed and secured "on deck" or "under deck away from heat" as defined in 49 CFR 176.63. When below deck stowage is utilized, the containers must be the last cargo to be stowed under the deck, and the hatches must be closed immediately after stowage is completed and before continuing loading of containers in other hatches or on deck.

b. On cargo vessels which are not containerships, containers of explosives must be stowed and secured "on deck" only, except that these containers may be stowed below deck, away from heat, in holds only which have been modified specifically for the carriage of containers in cellular guides or the equivalent. Stowage in other than cellular guides shall be to the satisfaction of the captain of the port.

c. On trailerships, "on deck" stowage may be in accordance with 49 CFR 176.76(e). Container chassis units must be secured to structural portions of the body of the vessel to the satisfaction of the captain of the port. Tiedowns and lashings to the units will be made to proper fittings provided on the units.

d. The on deck stowage locations for any vessel described above must be such that the containers of explosives are protected from boarding seas by ship's structures, other containers, or artificial barriers, to the greatest extent possible.

e. The segregation requirements of 49 CFR 176 apply to shipments by vessel. If the commodities being shipped require segregation, the separation shall be equal to or greater than the requirements for "separated from" segregation defined in 49 CFR 176.83. Containers shall be effectively secured to prevent movement during the voyage.

8. FIREFIGHTING/EMERGENCY ACTION: Firefighting equipment capable of reaching and piercing the containers loaded with explosives must be readily accessible to each container during unloading operations. Fire hoses shall be laid out and charged during handling operations.

FIGURE F5-4 (Cont.)

9. REPORTING REQUIREMENTS: Any incident occurring while shipping Class A and military explosives under the terms of this approval shall be reported in accordance with 49 CFR 171.16. In addition, a copy shall be immediately forwarded to the Commandant (G-MTH), U.S. Coast Guard, Washington, DC 20593-0001.

10. In addition to any special requirements prescribed herein, all applicable DOT Regulations, 49 CFR 171-179, apply to shipments of Class A and military explosives in freight containers or transport vehicles.

11. A copy of this approval must be on board each vessel transporting Class A and military explosives under the provisions of this approval.

12. EXPIRATION DATE: This approval remains in effect unless withdrawn, superseded by a revised approval, or the regulations are amended to cover the provisions of this approval.

AUTHORIZED BY:

A. B. CEE / Date
Commander, U.S. Coast Guard
Chief, Hazardous Materials Branch
Marine Technical and Hazardous Materials Division
By direction of the Commandant

FIGURE F5-5:COMMANDANT COAST GUARD APPROVAL (CGA) IN EFFECT 01APR89

CGA #	COMPANY	*	CGA #	COMPANY	*
003-80, Rev. 1	Nissho Iwai American Corp.	2	004-80, Rev. 3	Petty-Ray Div., Geosource, Inc.	2
002-81, Rev. 1	Zim Container Service.	1	006-81, Rev. 1	Olin Corp.	1
007-81, Rev. 2	Alaska Explosives Ltd.	1	013-81, Rev. 1	Government of Portugal	1
014-81, Rev. 1	Kerr Steamship Co.	1	018-81, Rev. 2	Schlumberger Well Services	1
019-81, Rev. 2	Dept. of Defense	1	020-81, Rev. 2	Atlas Powder International Ltd.	1
004-82, Rev. 1	Norton Lilly and Co.	1	005-82, Rev. 1	Atlas Powder Co.	1
008-82	Matson Agencies, Inc.	1	011-82, Rev. 1	Pacific Powder Co.	1
012-82, Rev. 1	Barber Steamship Lines	1	018-82, Rev. 1	Baker Sand Control	1
020-82, Rev. 2	Pacific Powder Co.	2	003-83, Rev. 2	U.S. International Mgt & Mktg	1
004-83, Rev. 1	Goex, Inc.	1	006-83, Rev. 1	Ensign Bickford	1
010-83, Rev. 1	Hercules, Inc.	1	011-83, Rev. 1	German Military Representative	1
013-83	Coonies Explosives, Inc.	1	014-83	Action Manufacturing Co.	1
015-83	Expro Chemical Products	1	001-84	Pengo International	1
002-84	Austin Powder	1	004-84	Gearhart Industries	1
005-84	Alaska Explosives	2	006-84	Koek Freight Co.	1
007-84	Berg Boat Co.	1	008-84	E. I. Du Pont de Nemours & Co.	1
009-84	ASCA Marine Inc.	1	010-84, Rev. 1	Nat'l Shipping Lines of Saudi Arabia	1
011-84	Petro – Systems, Inc.	1	012-84	N.L. McCullough Industries	1
013-84	Pakistan National Shipping Corp.	1	001-85	Sherwood International Corp.	1
002-85	Accurate International	1	003-85, Rev. 1	Transatlantica Agency USA	1
004-85	Braintree Companies	3	005-85, Rev. 1	Nedlloyd Lines	1
006-85	Pacific Powder Co.	4	007-85	Jet Research Center, Inc.	1
008-85	Southwest Explosives	1	001-86	Satin Air Freight	1
002-86	Israel Military Industries	1	003-86	Southwest Explosives	2
004-86	Thermex Energey Corp.	1	005-86	Lykes Bros. Steamship Co.	1
006-86	Government Supply Co.	1	007-86	Farrell Lines	1
008-86	Phillips-Parr, Inc.	1	009-86	Ireco, Inc.	1
010-86	Puerto Rico Marine Management	1	011-86	Mitsui O.S.K. Lines	1
012-86	Scol Shipping (N.A.)	1	001-87	Beaufort Shipping, Inc.	1
002-87	MacDonnel-Douglas Aerospace	1	003-87	Ridgeway International, Ltd.	1
004-87	C.C.C. Georgia, Inc.	1	005-87	ETI Explosive Technologies Int'l	3
006-87	ETI Explosive Technologies Int'l	2	007-87	ETI Explosive Technologies Int'l	1
008-87	Texas Instruments, Inc.	1	009-87	M. L. Marketing Company	1
010-87	Navigest, Inc.	1	011-87	Embassy of Australia	1
012-87	Trojan Corporation	1	013-87	Johns Hopkins University	1
014-87	Empremar Line	1	001-88	Alaska Explosives, Ltd.	4
002-88	Solar Int'l Shipping Agency	1	003-88	LTV Missiles and Electronics	1
004-88	Atlas Powder Co.	4	005-88	Hardrock Construction Co.	1

FIGURE F5-5: COMMANDANT COAST GUARD APPROVAL (CGA) IN EFFECT 01APR89 (Continued)

CGA #	COMPANY	*	CGA #	COMPANY	*
006-88	Woods Hole Oceanographic Institute	2	007-88	Western Atlas International	1
008-88	Marine Specialty, Inc.	1	009-88	Pan Oceans, Inc.	1
010-88	Alaska Explosives, Ltd.	1	011-88	Demex International, Ltd.	1
012-88	Marine Specialty, Inc.	2	013-88	Raytheon Company	1
014-88	Dock Express Contractors, Inc.	1	015-88	Kintetsu Intermodal (U.S.A.)	1
016-88	Loral Hycor, Inc.	1	017-88	Fire Art Corporation	1
018-88	Western State Energy Co.	1	019-88	Zai Chem, Inc.	1
001-89	Hogg Robinson (G.F.A.), Ltd.	1	002-89	Naval Weapons Sta, Concord, CA	3
003-89	Old Dominion Stevedoring Corp.	3	004-89	Guiberson Div., Dresser Industries, Inc.	1
005-89	Royal Ordnance, plc.	1	006-89	Otter Creek Chemical Corp.	1

*NOTES:

1. Freight container for military or Class A explosives
2. Oversize portable magazine
3. Industrial truck for use in explosives hold
4. Class A explosives in rail freight car

4. Import Shipments of Explosives

Import shipments of military, Class A, and Class B explosives must be in complete compliance with the applicable provisions of 46 and 49 CFR. The option of complying with the IMDG Code does not extend to these shipments. An import shipment of military or Class A explosives in a freight container or oversize portable magazine must therefore be in compliance with a CGA issued by Commandant (G-MTH).

5. Testing and Approval of Explosives ("EX" Numbers)

Every explosive, other than a military explosive, transported within the United States must at some time have been tested and approved in accordance with 49 CFR 173.86 or 171.19. Military explosives must have been tested and approved in accordance with 46 CFR 146.20-13. If a COTP has any doubt about the proper shipping name or hazard classification of an explosives shipment, the shipper may be requested to provide documentation of the approval. Approvals issued by the DOT's Office of Hazardous Materials Transportation (OHMT), are identified by a seven digit number prefixed by the letters "EX." Approvals issued by other agencies have been "grandfathered" and remain valid. COTP's should ensure that foreign shippers, importers, or their agents are aware of this requirement and have obtained a valid OHMT approval before attempting to import explosives of foreign origin. Figure F5-6 provides a sample OHMT explosives classification approval letter.

FIGURE F5-6: SAMPLE OHMT EXPLOSIVES CLASSIFICATION APPROVAL

April 30, 1987

Mr. J. R. Ewing
Ewing Energy Corporation
10000 Main Street
Dallas, TX 75240

Dear Mr. Ewing:

Based on the documentation submitted by Ewing Energy Corporation in accordance with Sections 173.86 and 173.114a, Title 49, Code of Federal Regulations, the new explosive products listed below have been approved for shipment and are hereby classified as follows:

Reference	Product Designation	Description	Hazard Class
EX-8604670	001-3700-473	Detonators	Class A explosives
EX-8604671	001-3700-453	Detonators	Class A explosives

Only explosives and explosive devices as described in the recommending agency report are authorized.

Should you have any questions regarding these classifications, please call this office at (202) 366-4514.

Sincerely,

X. Y. Zee
Chief, Approvals Branch
Office of Hazardous Materials Transportation

6. Segregation of Containerized Explosives

49 CFR 176.83(a) prohibits the stowage of incompatible explosives in the same hold or compartment. On containerships this prohibition may be impracticable when it is necessary to stow freight containers containing incompatible explosives. In this case, a COTP may authorize as alternative stowage "separate from" segregation in accordance with 49 CFR 176.83(d)(3)(ii)(A), which provides an equivalent level of safety.

F. SHIPS' STORES

1. Introduction

Hazardous materials used as ships' stores (i.e., other than as fuel for the main propulsion plant) are regulated under 46 CFR 147. It should be noted that the term "ships' stores" does not apply only to small containers. Some vessels have large, boxed deck tanks for such stores (e.g., a deck tank carrying nitrogen as an inert gas supply).

2. Authorization for Carriage

A hazardous material may be carried on board a vessel as a ships' store if it is labeled according to 46 CFR 147.30 and if it is not prohibited in Subpart B of 46 CFR 147. Certain materials, including flammable liquids not addressed in Subpart B, Class A Explosives, and Class A Poisons must be approved for carriage by Commandant (G-MTH-1). A list of materials approved under this provision may be obtained from Commandant (G-MTH-1). Waivers of any of the carriage requirements in 46 CFR 147 may also be obtained from Commandant (G-MTH-1) as detailed in 46 CFR 147.9.

G. FUMIGATION

Interim regulations for shipboard fumigation are located in 46 CFR 147A. They apply to foreign and U.S. vessels as described in 46 CFR 146.02-2.

> **NOTE:** These regulations are under review, having been found inadequate to address unmanned barges, LASH or SEABEE type barges carried aboard ship, and intermodal freight containers. The rules for these particular applications are contained in two special permits: SP 2-75 and SP 52-75.

Questions should be directed to Commandant (G-MTH-1).

Reporting of Deficiencies

Deficiency Codes for Data Entry and Reporting

The following codes shall be used for entering deficiencies discovered during all types of CG Inspections (Port State Control, Alternative Compliance Program, Streamlined Inspection Program, or Traditional Inspections).

Code	Category
0100	**Ship's Certificates / Logbooks**
0110	cargo ship safety equipment
0111	cargo ship safety construction
0112	passenger ship safety
0113	cargo ship safety radio
0114	cargo ship safety
0120	load lines
0130	liquefied gases in bulk (CoF/GC Code)
0131	liquefied gases in bulk (CoF/IBC Code)
0135	minimum safe manning document
0140	dangerous chemicals in bulk (CoFIBC Code)
0141	dangerous chemicals in bulk (CoF/IBC Code)
0150	prevention of pollution by oil (IOPP)
0155	pollution prevention noxious liquid substances in bulk
0170	document of compliance dangerous goods
0180	tonnage certificate
0190	logbooks / compulsory entries
0199	Vessel detained due to contravention of ILO or STOW conventions. (Code 199 to be used in reporting when there is no certificate applicable to the convention violation. Possible detainable deficiencies relating to ILO or STCW conventions are listed under main items 0200, 0300, 0400 and 0500.)
0200	**Crew**
0210	minimum age
0220	certificates of competency
0230	number/composition (according to the Safe Manning Document, if available)
0240	medical certificates
0250	certificated persons for survival craft
0299	other

APPENDIX A: DEFICIENCY CODES (Quick Reference)

Code	Category
0300	**Accommodation**
0310	dirty, parasites
0320	ventilation, heating
0330	sanitary facilities
0340	drainage
0350	lighting
0360	pipes, wires (insulation)
0370	sick bay
0371	medical equipment
0399	other
0400	**Food and Catering**
0410	galley, handling rooms
0420	provisions
0430	water, pipes and tanks
0499	other
0500	**Working Spaces**
0510	ventilation, heating
0520	lighting
0599	other

Code	Category
0600	**Life Saving Appliances**
0610	lifeboats
0611	lifeboat inventory
0613	stowage of lifeboats
0615	rescue boats
0616	rescue boat inventory
0618	stowage of rescue boats
0620	inflatable liferafts
0625	rigid liferafts
0628	stowage of liferafts
0630	launching arrangements for survival craft
0635	launching arrangements for rescue boats
0640	distress flares
0650	lifebuoys
0660	lifejackets
0663	immersion suits
0666	thermal protective aids
0669	radio lifesaving appliances
0670	portable radio apparatus for survival craft
0671	radiotelegraph instalation for survival craft
0672	EPIRBs for survival craft
0673	2-way radiotelephone apparatus for survival craft
0674	emergency equipment for 2-way communication
0675	general emergency alarm
0676	public address system
0680	embarkation arrangements - survival craft
0683	embarkation arrangements - rescue boats
0684	means of recovery of lifesaving appliances
0686	buoyant apparatus
0690	line throwing appliance
0695	on board training and instructions
0696	record of inspections / maintenance
0699	other

Code	Category
0700	**Fire Fighting Appliances**
0710	fire prevention
0711	inert gas system
0715	detection
0720	fire fighting equipment
0725	fixed fire extinguishing installation
0730	appliances (general equipment)
0735	personal equipment
0740	pumps
0745	ventilation, fire-dampers, valves, quick closing devices, means of control
0750	international shore connection
0799	other
0800	**Accident Prevention**
0810	personal equipment
0820	protection machines/parts
0830	pipes, wires (insulation)
0899	other

Code	Category
0900	**Safety in General**
0910	hydraulic and other closing devices/watertight doors
0915	signs, indications
0920	safety plans
0925	musters and drills
0930	stability and strength
0936	steering gear
0938	damage to hull due to weather or ship operation
0940	ballast, fuel and other tanks
0945	emergency lighting, batteries and switches
0950	electric equipment in general
0955	pilot ladders
0956	gangway, accommodation ladder
0960	means of escape
0970	location of emergency installations
0981	beams, frames, floors - operational damage
0982	beams, frames, floors - corrosion
0983	hull — corrosion
0984	hull — cracking
0985	bulkheads — corrosion
0986	bulkheads — operational damage
0987	bulkheads — cracking
0988	decks — corrosion
0989	decks — cracking
0999	other
1000	**Alarm Signals**
1010	general alarm
1020	fire alarm
1030	steering-gear alarm
1040	engineers' alarm
1050	inert gas alarm
1060	machinery controls alarm
1070	UMS-alarms
1080	boiler-alarm
1099	other

Code	Category
1100	**Cargo**
1110	stowage of cargo
1120	grain
1130	stowage/packaging of dangerous goods
1135	dangerous liquid chemicals in bulk
1138	liquefied gases in bulk
1140	other cargo
1150	loading and unloading equipment
1160	holds and tanks
1170	dangerous goods codes
1199	other
1200	**Load Lines**
1210	overloading
1220	freeboard marks
1230	railing, cat walks
1240	cargo and other hatchways
1250	covers (hatchway-, portable-, tarpaulins, etc.)
1260	windows, side scuttles
1270	doors
1275	ventilators, air pipes, casings
1280	machinery space openings
1282	manholes/flush scuttles
1284	cargo ports/etc.
1286	scuppers, inlets, etc.
1288	freeing ports
1290	lashings (timber)
1299	other
1300	**MoorIng Arrangements**
1310	ropes, wires
1320	anchoring devices
1330	winches and capstans
1340	adequate lighting

Code	Category
1399	other
1400	**Propulsion and Auxiliary Machinery**
1410	propulsion main engine
1420	cleanliness of engine room
1430	auxiliary engine
1440	bilge pumping arrangements
1450	UMS-ship
1460	guards/fencing around dangerous machinery parts
1470	insulation wetted through (oil)
1499	other
1500	**Navigation**
1510	equipment
1520	shipborne navigational equipment
1530	radar
1540	gyro compass
1541	magnetic compass
1550	lights, shapes, sound-signals
1551	signalling lamp
1560	ship's charts
1570	ship's nautical publications
1575	echosounder
1580	log
1581	rudder angle indicator
1582	revolution counter
1583	variable pitch indicator
1585	rate-of-turn indicator
1590	international code of signals
1599	other

Code	Category
1600	**Radio**
1610	auto alarm
1615	watch receiver 2182kHz
1620	main installation
1621	MF radio installation
1623	MF/HF radio installation
1625	INMARSAT ship earth station
1630	reserve installation
1635	maintenance/duplication of equipment
1640	direction finder
1650	vhf station
1651	VHF radio installation

➔ **NOTE:** Odd codes are for ships equipped for GMDSS.

1655	facilities for reception of marine safety information
1660	radio telegraph installation lifeboat
1670	portable radio installation
1671	satellite EPIRB 406MHz/1.6 GHz
1673	VHF EPIRB
1675	ship's radar transponder
1677	reserve source of energy
1680	radio log (diary)
1685	operation/maintenance
1699	other

Code	Category
1700	**Marine Pollution - Annex I**
1705	shipboard oil pollution emergency plan (SOPEP)
1710	oil record book
1720	control of discharge of oil
1721	retention of oil on board
1725	segregation of oil and water ballast
1730	oily-water separating equipment
1735	pumping, piping and discharge arrangements of oil tankers
1740	oil discharge monitoring and control system
1745	15 PPM alarm arrangements
1750	oil/water interface detector
1760	standard discharge connection
1770	SBT, CBT, COW
1780	pollution report
1790	ship type designation
1795	suspected of discharge violation
1799	other
1800	**Tankers**
1810	cargo area segregation
1815	air intakes/openings to accommodation, machinery, and control station spaces
1816	wheelhouse door, window
1820	cargo pumproom/handling spaces
1825	spaces in cargo areas
1830	cargo transfer
1835	cargo vent system
1836	temperature control
1840	instrumentation
1850	fire protection cargo deck area
1860	personal protection
1870	special requirements
1880	cargo information
1885	tank entry
1899	other

Code	Category
1900	**Marine Pollution - Annex II**
1910	cargo record book
1911	P&A manual
1920	efficient stripping
1925	residue discharge systems
1930	tank washing equipment
1940	prohibited discharge of NLS slops
1960	cargo heating systems - cat. B substances
1970	ventilation procedures/equipment
1980	pollution report
1990	ship type designation
1999	other
2000	**SOLAS Related Operational Deficiencies**
2010	muster list
2015	communication
2020	fire drills
2025	abandon ship drills
2030	damage control plan
2035	fire control plan
2040	bridge operation
2045	cargo operation
2050	operation of machinery
2055	manuals, instructions, etc.
2060	dangerous goods or harmful substances in packaged form
2099	other

Code	Category
2100	**MARPOL related operational deficiencies**
2110	oil and oily mixtures from machinery spaces
2115	loading, unloading and cleaning procedures for cargo spaces of tankers
2120	garbage
2199	other
2200	marine pollution - annex III
2210	packaging
2220	marking and labelling

➔ The codes 2000 and 2100 are for statistical purposes only and Should not be used in Inspection reports for nonspecific deficiencies. If non-specific deficiencies must be included in the inspection reports, codes 2099 and 2199 should respectively be applied.

2230	documentation
2240	stowage
2299	other
9800	
9801	all other deficiencies (clearly hazardous to safety, health or environment, specified in clear text)
9900	
9901	other deficiencies (not clearly hazardous to safety, health or environment, specified in clear text)

APPENDIX A1: DEFICIENCY CODES

Code	Category	Description	Cite

Reporting of Deficiencies

Deficiency Codes for Data Entry and Reporting

The following codes shall be used for entering deficiencies discovered during all types of CG Inspections (Port State Control, Alternative Compliance Program, Streamlined Inspection Program, or Traditional Inspections).

Code	Category	Description	Cite
Ship's Certificates/Logbooks			
0110	Cargo Ship Safety Equipment	Duration and validity	S74P88 Chap I Reg 14
		Issue	S74 Chap I Reg 12
		Surveys	S74-88 Chap I Reg 8
		Intermediate survey (Tankers >= 10yrs old)	S74P78 Chap I Reg 8 b
		Duration and validity	S74P78 Chap I Reg 14
		Duration	S74 Chap I Reg 14
		Issue or endorsement (other government)	S74P88
		Issue (other government)	S74 Chap I Reg 13
		Issue or endorsement	S74P88 Chap I Reg 12
		Issue	S74-88 Chap I Reg 12
		Surveys	S74P88 Chap I Reg 8
0111	Cargo Ship Safety Construction	Issue (other government)	S74 Chap I Reg 13
		Intermediate survey (Tankers >= 10yrs old)	S74P78 Chap I Reg 10 a ii
		Surveys	S74P88 Chap I Reg 10
			S74P78 Chap I Reg 10
			S74 Chap I Reg 10
		Intermediate survey (Tankers >= 10yrs old)	S74P78 Chap I Reg 10 c
		Duration and validity	S74P88 Chap I Reg 14
			S74P78 Chap I Reg 14
		Issue or endorsment (other government)	S74P88 Chap I Reg 13
		Issue and endorsement	S74P88 Chap I Reg 12
		Issue	S74 Chap I Reg 12
		Duration	S74 Chap I Reg 14
0112	Passenger Ship Safety	Duration and validity	S74P88 Chap I Reg 14
		Issue	S74-88 Chap I Reg 12
		Surveys	S74-88 Chap I Reg 7 b
			S74P88 Chap I Reg 7
			S74P78 Chap I Reg 7
			S74 Chap I Reg 7
		Duration	S74 Chap I Reg 14
		Issue or endorsment (other government)	S74P88 Chap I Reg 13
		Issue	S74 Chap I Reg 12
		Issue or endorsement	S74P88 Chap I Reg 12
		Duration and validity	S74P78 Chap I Reg 14
		Issue (other government)	S74 Chap I Reg 13

Code	Category	Description	Cite
Ship's Certificates/Logbooks (Continued)			
0113	Cargo Ship Safety Radio/Radiotelephony	Issue	S74 Chap I Reg 12
	Cargo Ship Safety Radio	Surveys	S74P88 Chap I Reg 9
			S74-88 Chap I Reg 9
		Duration and validity	S74P88 Chap I Reg 14
		Duration	S74-88 Chap I Reg 14
		Issue or endorsement (other government)	S74P88 Chap I Reg 13
		Issue or endorsement	S74P88 Chap I Reg 12
		Issue	S74-88 Chap I Reg 12
	Cargo Ship Safety Radio/Radiotelephony	Issue (other government)	S74 Chap I Reg 13
	Cargo Ship Safety Radio/Radiotelegraphy	Duration	S74 Chap I Reg 14
		Issue	S74 Chap I Reg 12
	Cargo Ship Safety Radio/Radiotelephony	Duration	S74 Chap I Reg 14
0114	Cargo Ship Safety	Duration and validity	S74P88 Chap I Reg 14
		Surveys	S74P88 Chap I Reg 8,9,10
		Issue or endorsement (other government)	S74P88 Chap I Reg 13
		Issue or endorsement	S74P88 Chap I Reg 12
0120	Load Lines	Issue	LL66P88 Art 16
		Issue (other government)	LL66 Art 17
			LL66P88 Art 17
		Duration	LL66 Art 19
			LL66P88 Art 19
		Initial/Periodical	LL66 Art 14
		Issue/Periodical	LL66P88 Art 14
		Issue	LL66 Art 16
0130	Liquefied Gases in Bulk (CoF/GC-Code)	Duration	GCC-4 Chap I No 1.6 5
		Additional survey	GCC-4 Chap I No 1.6 1 e
		Annual survey	GCC-4 Chap I No 1.6 1 d
		Intermediate survey	GCC-4 Chap I No 1.6 1 c
		Initial survey	GCC-4 Chap I No 1.6 1 a
		Issue (other government)	GCC-4 Chap I No 1.6 4
		Issue	GCC-4 Chap I No 1.6 3
		Periodical survey	GCC-4 Chap I No 1.6 1 b
0131	Liquefied Gases in Bulk (CoF/IGC Code)	Additional survey	IGCC*) Chap I No 1.5 2 1.5
		Issue	IGCC*) Chap I No 1.5 4
		Issue (other government)	IGCC*) Chap I No 1.5 5
		Duration	IGCC*) Chap I No 1.5 6
		Initial survey	IGCC*) Chap I No 1.5 2 1.1
		Periodical survey	IGCC*) Chap I No 1.5 2 1.2
		Intermediate survey	IGCC*) Chap I No 1.5 2 1.3
		Annual survey	IGCC*) Chap I No 1.5 2 1.4
0135	Safe Manning Document	Safe Manning Document	S74-89 Chap V Reg 13 6
0140	Dangerous Chemicals in Bulk	Issue (other government)	BCC-10 Chap I No 1.6 4 (CoF/BC-Code)
		Duration	BCC-10 Chap I No 1.6 5
		Initial survey	BCC-10 Chap I No 1.6 1 1
		Periodical survey	BCC-10 Chap I No 1.6 1 2
		Intermediate survey	BCC-10 Chap I No 1.6 1 3
		Annual survey	BCC-10 Chap I No 1.6 1 4
		Additional survey	BCC-10 Chap I No 1.6 1 5
		Issue	BCC-10 Chap I No 1.6 3

Code	Category	Description	Cite
Ship's Certificates/Logbooks (Continued)			
0141	Dangerous Chemicals in Bulk	Initial survey	IBCC*) Chap I No 1.5 2 1.1 (CoF/IBC-Code)
		Additional survey	IBCC*) Chap I No 1.5 2 1.5
		Annual survey	IBCC*) Chap I No 1.5 2 1.4
		Periodical survey	IBCC*) Chap I No 1.5 2 1.2
		Duration	IBCC*) Chap I No 1.5 6
		Issue (other government)	IBCC*) Chap I No 1.5 5
		Issue	IBCC*) Chap I No 1.5 4
		Intermediate survey	IBCC*) Chap I No 1.5 2 1.3
0150	Prevention of Pollution by Oil (IOPP)	Issue	M73/78 Annex I Reg 5
		Issue (other government)	M73/78 Annex I Reg 6
		Duration	M73/78 Annex I Reg 8
		Initial survey	M73/78 Annex I Reg 4 1 a
		Periodical survey	M73/78 Annex I Reg 4 1 b
		Intermediate survey	M73/78 Annex I Reg 4 1 c
		Annual survey	M73/78 Annex I Reg 4 3 b
0155	Pollution Prevention NLS in Bulk	Intermediate survey	M73/78 Annex II Reg 10 1 c
		Periodical survey	M73/78 Annex II Reg 10 1 b
		Annual survey	M73/78 Annex II Reg 10 1 d
		Duration	M73/78 Annex II Reg 12
		Issue	M73/78 Annex II Reg 11 2
		Issue (other government)	M73/78 Annex II Reg 11 3
		Initial survey	M73/78 Annex II Reg 10 1 a
0170	Doc. of Compliance Dangerous Goods	Issue	S74-81 Chap II-2 Reg 54 3
0180	Tonnage Certificate	Tonnage Certificate	T69 Art 7 1
0190	Logbooks/compulsory entries	Radio (see code 1680)	
		Safety - Opening/closing doors, etc. (Passenger ship)	S74-81 Chap II-1 Reg 15 12 2 S74-81 Chap II-1 Reg 25 1,2 S74-88 Chap II-1 Reg 20-1 5 S74-89 Chap II-1 Reg 15 9 4 S74-89 Chap II-1 Reg 15 10 2 S74-81 Chap II-1 Reg 15 11 2
		Steering gear tests/checks	S74P78 Chap V Reg 19-2 f S74-81 Chap V Reg 19-2 f
		Safety - Opening/closing doors, etc. (Passenger ship)	S74-89 Chap II-1 Reg 15 11
		Life saving appliances - Musters, drills/fire	S74-83 Chap III Reg 18 5
		Safety - Opening/closing doors, etc. (Passenger ship)	S74 Chap II-1 Reg 22 a,b
		Life saving appliances - Musters, drills/fire	S74 Chap III Reg 26 a iv
		Life saving appliances - Inspection	S74-83 Chap III Reg 52 7 S74-83 Chap III Reg 19 7
		Safety - Musters/drills/inspections - Passengership	S74 Chap II-1 Reg 22 a,c S74-81 Chap II-1 Reg 25 1,3
		Safety - All ships	S74-83 Chap III Reg 18 5
		Safety - Muster/drills/inspections - Passengership	S60 Chap II Reg 22
		Safety - Opening/closing doors, etc.	

Code	Category	Description	Cite
		(Passenger ship)	
Crew			
0210	Minimum age	Minimum age	ILO7 Art 2
0220	Certificates of Competency	Certificates (content)	STCW Chap I Reg I/2
		Minimum Requirements - Watch Engineroom Rating	STCW Chap III Reg III/6
		Minimum Requirements - Radio Officer	STCW Chap IV Reg IV/1
		Minimum Requirements - Radiotelephone operator	STCW Chap IV Reg IV/3
		Training and Qualifications (master, officers, rating) - Oil tanker	STCW Chap V Reg V/1
		Certificates (form of endorsement)	STCW A6 juncto
		Training and Qualifications (master, officers, rating) - Liquified gas carrier	STCW Chap V Reg V/3
0220	Certificates of Competency (>=750KW)	Minimum Requirements - Watch-Engineer	STCW Chap III Reg III/4
		Minimum Requirements - Master + Nav Officer (ship<200 grt)	STCW Chap II Reg II/3
		Certificates (form of endorsement)	STCW Chap I Reg I/2
		Training and Qualifications (master, officers, rating) - Chemical tanker	STCW Chap V Reg V/2
		Minimum Requirements - Chief - 2nd Engineer (>=3000KW)	STCW Chap III Reg III/2
		Minimum Requirements - Chief - 2nd Engineer (750KW - 3000KW)	STCW Chap III Reg III/3
		Nav. Rating (ship>=200grt)	STCW Chap II Reg II/6
		Minimum Requirements - Nav. Officer (ship>=200grt)	STCW Chap II Reg II/4
		Minimum Requirements - Master + Chief Mate (200grt<=ship<1600grt)	STCW Chap II Reg II/2 3,4,5
		General - Radio personnel	S74-88 Chap IV Reg 16
		General - Radiotelephone operator	S74 Chap IV Reg 2 f
		General - Radio officer	S74 Chap IV Reg 2 e
		General - Master, officer, rating	STCW A.VI
		General - Officer	ILO53 Art. 3/4
		Minimum Requirements - Master + Chief Mate (ship >=1600grt)	STCW Chap II Reg II/2 1,2,3
0230	Number/composition	Radio personnel Radiotelehone operator (number)	S74-81 Chap IV Reg 7 b
		Radio personnel	S74-88 Chap IV Reg 16
		Manning (General)	S74-89 Chap V Reg 13 S74 Chap V Reg 13 S60 Chap V Reg 13
		Radio officer (number)	S74 Chap IV Reg 6
		Radiotelephone operator (number)	S74 Chap IV Reg 7 a
0240	Medical certificates	Signature/issue	ILO73 Art 3
		Validity	ILO73 Art 5
0250	Certificated persons for survival craft	Certificate proficiency in survival craft	STCW Chap VI Reg VI/1
		Certificated persons	S74-83 Chap III Reg 3 1
		Manning numbers	S74-83 Chap III Reg 10 3
0290	Other	Other	

Code	Category	Description	Cite
Accommodation			
0310	Dirty, parasites	Dirty, parasites	ILO92 Part III Art 17 1
0320	Heating Ventillation	Heating Ventillation	ILO92 Part III Art 8 ILO92 Part III Art 7
0330	Sanitary Facilities	Sanitary Facilities	ILO92 Part III Art 13
0340	Drainage	Drainage	ILO92 Part III Art 6 13
0350	Lighting	Lighting	ILO92 Part III Art 9
0360	Pipes, wires (insulation)	Pipes, wires (insulation)	ILO92 Part III Art 6 6
0370	Sickbay	Sickbay	ILO92 Part III Art 14 1
0371	Medical Equipment	Medical Equipment	ILO92 Part III Art 14 7
0399	Other	Laundry Access/Structure Sleeping room - No direct openings Sleeping room - Furnishings Sleeping room - berth dimensions, etc. Sleeping room - Clear head Messroom (location) Oil skin locker	ILO92 Part III Art 13 14 ILO92 Part III Art 6 1 ILO92 Part III Art 6 2 ILO92 Part III Art. 10 22,23,25 ILO92 Part III Art. 10 12,13,16,19 ILO92 Part III Art. 10 7 ILO92 Part III Art. 11 8 ILO92 Part III Art 15 1
Food and Catering			
0410	Galley, handlingroom	Ventilation/lighting Maintenance	ILO68 Art 2 a ILO68 A5 juncto ILO68 Art 5 2 b
0420	Provisions	Provisions	ILO68 Art 5 2 a
0430	Water, pipes, tanks	Water, pipes, tanks	ILO68 Art 5 1
0499	Other	Other	

Code	Category	Description	Cite
Working Spaces			
0510	Ventilation/heating	Ventilation/heating	ILO134 Art 4 3 a
0520	Lighting	Lighting	ILO134 Art 4 3 a,d
0599	Other	Danger areas - Warning notice	
		Danger areas - Noxious gases/O2	ILO134 Art 4 3 d,h
		Protection machinery - Steam pipes, etc.	ILO134 Art 4 3 a,d
		Protection machinery - Machinery	ILO134 Art 4 3 c
		Safe means of access - Obstruction/slippin,	ILO134 Art 4 3 a,d
		Safe means of access - Deck - hold/tank, etc.	ILO134 Art 4 3 a
		Safe means of access - Shore -ship	
		Protection machinery - Electrical	ILO134 Art 4 3 a,c
Life Saving Appliances			
0610	Lifeboats	Free-fall lifeboats	S74-83 Chap III Reg 44 6
		Motor lifeboats - Number (Cargo ship)	S74-83 Chap III Reg 26
		Motor lifeboats - Specification	S74 Chap III Reg 9
		Motor lifeboats - Propulsion	S74 Chap III Reg 41 6
		Mechanically propelled lifeboats	S74 Chap III Reg 10
		Partially enclosed lifeboats	S74-83 Chap III Reg 42
			S74-88 Chap III Reg 42 5
		General - Carrying capacity	S74-83 Chap III Reg 41 2
		Totally enclosed lifeboats	S74-83 Chap III Reg 44
		Lifeboats qith self contained air support	S74-83 Chap III Reg 45
		Fire protected lifeboats	S74-83 Chap III Reg 46
		Motor lifeboats - Number (Cargo ship)	S74 Chap III Reg 35
		Self-righting partially enclosed lifeboats	S74-83 Chap III Reg 43
		Motor lifeboats - Number (Passenger ship)	S74-83 Chap III Reg 20
			S74 Chap III Reg 27
			S74 Chap III Reg 8 a
		General - Fittings	S74-88 Chap III Reg 41 7 8
			S74-83 Chap III Reg 41 7
		General - Construction	S74 Chap III Reg 5
		General - Marking	S74 Chap III Reg 20 a,e
			S74-83 Chap III Reg 41 9
		General - Carrying capacity	S74 Chap III Reg 7
		General - Cubic capacity	S74 Chap III Reg 6
		General - Constuction	S74-83 Chap III Reg 41 1
		Motor lifeboats - Number (Cargo ship)	S74 Chap III Reg 8 b,c
0611	Lifeboat inventory	Equipment	S74 Chap III Reg 11
		Security	S74-83 Chap III Reg 41 8
			S74 Chap III Reg 12
		Equipment	S74-83 Chap III Reg 41 8
			S74-88 Chap III Reg 41 8 30
0613	Lifeboat stowage	Passenger ships	S74 Chap III Reg 29
			S74-83 Chap III Reg 13 1,2,3
		Cargo ships	S74 Chap III Reg 36 a,c
			S74-83 Chap III Reg 13 1,2,3

Code	Category	Description	Cite
Life Saving Appliances			
0615	Rescue boats	General requirements - Number (Passenger ship)	S74-83 Chap III Reg 20 2
		General requirements - Carrying capacity	S74-83 Chap III Reg 41 2
		Inflated rescue boats	S74-83 Chap III Reg 47 3
		General requirements - Propulsion	S74-83 Chap III Reg 47 1 7
			S74-83 Chap III Reg 41 6
		General requirements - Number (Cargo ship)	S74-83 Chap III Reg 26 2
		General requirements - Fittings	S74-83 Chap III Reg 41 7 6,7,9,12
		General requirements - Construction	S74-83 Chap III Reg 41 1
		General requirements - Marking	S74-83 Chap III Reg 41 9
		General requirements - Fittings	S74-88 Chap III Reg 41 7 8
		General requirements - Marking	S74-83 Chap III Reg 47 3 4
0616	Rescue boat inventory	Equipment	S74-83 Chap III Reg 47 2
		Security	S74-83 Chap III Reg 47 2 2.1
0618	Rescue boat stowage	Rescue boat stowage	S74-83 Chap III Reg 14
0620	Inflatable liferafts	Davit launched	S74-83 Chap III Reg 38 4
		Number (Passenger ship)	S74-83 Chap III Reg 20
		Number (Cargo ship)	S74 Chap III Reg 35
			S74-83 Chap III Reg 26
		Equipment	S74 Chap III Reg 17
			S74-83 Chap III Reg 38 5
			S74-88 Chap III Reg 38 5 1.14
		Security	S74-83 Chap III Reg 38 5 5.4
		Davit launched	S74-83 Chap III Reg 39 9
		Fittings	S74-88 Chap III Reg 38 3
			S74-83 Chap III Reg 39 6
		Equipment	S74-83 Chap III Reg 39 10
		Carrying capacity	S74 Chap III Reg 15 j,n
		Fittings	S74-83 Chap III Reg 38 3
		Number (Passenger ship)	S74 Chap III Reg 27
		Construction	S74 Chap III Reg 15
			S74-83 Chap III Reg 39 2
		Carrying capacity	S74-83 Chap III Reg 38 2
			S74-83 Chap III Reg 39 3
		Marking	S74-83 Chap III Reg 38 5 2,3
			S74-83 Chap III Reg 39 8
		Marking container	S74 Chap III Reg 20 c
			S74-83 Chap III Reg 39 7 3
		Marking	S74 Chap III Reg 20 c,e
		Fittings	S74 Chap III Reg 15
		Construction	S74-83 Chap III Reg 38 1

Code	Category	Description	Cite
Life Saving Appliances – continued			
0625	Rigid liferafts	Security	S74-83 Chap III Reg 38 5 5.4
		Davit launched	S74-83 Chap III Reg 40 8
		Number (Passenger ship)	S74-83 Chap III Reg 20 1
		Number (Cargo ship)	S74-83 Chap III Reg 26 1,3
		Equipment	S74 Chap III Reg 17
			S74-88 Chap III Reg 38 5 1.14
		Fittings	S74-83 Chap III Reg 40 6
		Number (Passenger ship)	S74 Chap III Reg 27
		Equipment	S74-83 Chap III Reg 38 5
		Fittings	S74-83 Chap III Reg 38 3
			S74 Chap III Reg 16
		Marking	S74-83 Chap III Reg 40 7
			S74 Chap III Reg 20 d,e
		Carrying capacity	S74-83 Chap III Reg 40 3
			S74-83 Chap III Reg 38 2
		Construction	S74-83 Chap III Reg 40 2
			S74-83 Chap III Reg 38 1
			S74 Chap III Reg 16
		Number (Cargo ship)	S74 Chap III Reg 35
		Fittings	S74-88 Chap III Reg 38 3
0628	Liferaft stowage	Passenger ship	S74-83 Chap III Reg 23
		Cargo ship	S74-83 Chap III Reg 29
			S74 Chap III Reg 36
		Passenger ship	S74 Chap III Reg 29
		General	S74-83 Chap III Reg 13 1,4,5,6
		Cargo ship	S74-83 Chap III Reg 26 3 2
0630	Launching arrangements for survival craft	General	S74-83 Chap III Reg 15
			S74-83 Chap III Reg 48
		Handling (Passenger ship)	S74 Chap III Reg 29
			S74-83 Chap III Reg 20 1 4
		Handling (Cargo ship)	S74 Chap III Reg 36
			S74-83 Chap III Reg 26 1 5
		Handling (Cargo ship >=20,000 tons)	S74-83 Chap III Reg 28 2
0635	Launching arrangements for rescue boats	Handling (Cargo ship)	S74-83 Chap III Reg 26 1 5
		General	S74-83 Chap III Reg 15
			S74-83 Chap III Reg 16
			S74-83 Chap III Reg 48
	Launching arrangements for rescue boats	Handling (Passenger ship)	S74-83 Chap III Reg 20 1 4
0640	Distress flares	Distress flares	S74-83 Chap III Reg 6 3
			S74 Chap III Reg 24
0650	Lifebuoys	Requirements/specifications	S74 Chap III Reg 21
			S74-83 Chap III Reg 7 1
			S74-83 Chap III Reg 30
			S74-83 Chap III Reg 32
		Number (Passenger ship)	S74 Chap III Reg 34
			S74-83 Chap III Reg 21 1
		Number (Cargo ship)	S74 Chap III Reg 37
			S74-83 Chap III Reg 27 1

Code	Category	Description	Cite
Life Saving Appliances – continued			
0660	Lifejackets	Requirements Number (Cargo ship) Number (Passenger ship) Requirements	S74-83 Chap III Reg 7 2 S74 Chap III Reg 22 S74-83 Chap III Reg 21 2 S74 Chap III Reg 22 S74-83 Chap III Reg 30 S74 Chap III Reg 22 S74-83 Chap III Reg 32
0663	Immersion suits	Number (Cargo ship) Requirements Number (Passenger ship)	S74-83 Chap III Reg 27 3 S74-83 Chap III Reg 7 3 S74-83 Chap III Reg 30 S74-83 Chap III Reg 33 S74-83 Chap III Reg 21 4
0666	Thermal protective aids	Number (Cargo ship) Requirements	S74-83 Chap III Reg 27 3 S74-83 Chap III Reg 30 S74-83 Chap III Reg 34
0669	Radio life-saving appliances	Two-way VHF radio telephone apparatus Radar transponders (see also code 1675)	S74-88 Chap III Reg 1 6 S74-88 Chap III Reg 6 2.1 S74-88 Chap III Reg 1 6 S74-88 Chap III Reg 6 2.2
0670	Portable radio apparatus for survival craft	Portable radio apparatus for survival craft (see also code 1670)	S60 Chap III Reg 13 S74 Chap III Reg 13 S74-83 Chap III Reg 6 2 1
0671	Radiotelegraph installation for survival craft	Radiotelegraph installation for survival craft	S74 Chap III Reg 14 (see also code 1660) S74-83 Chap III Reg 6 2 2.3 (see also code 1660) S60 Chap III Reg 14
0672	EPIRB's for survival craft 2.3	EPIRB's for survival craft (see also code 1699)	S74-83 Chap III Reg 6 1,2
0673	Two-way radiotelephone appliances for survival craft	Two-way radiotelephone appliances for survival craft (see also code 1699)	S74-83 Chap III Reg 6 1,2 2.4
0674	Emergency equipment for 2-way communications	Emergency equipment for 2-way communications	S74-83 Chap III Reg 6 4 1
0675	General emergency alarm S74-83 Chap III Reg 6 4 2 S74-83 Chap III Reg 50	General emergency alarm	S74 Chap III Reg 26 d
0676	Public address system	Public address system	S74-83 Chap III Reg 6 4 2

Code	Category	Description	Cite
Life Saving Appliances – continued			
0680	Embarkation arrangement survival craft	Passenger ship	S74-83 Chap III Reg 22 1
		Cargo ship	S74-83 Chap III Reg 28
			S74 Chap III Reg 36 h
		General	S74-83 Chap III Reg 11
			S74 Chap III Reg 19
		Passenger ship	S74 Chap III Reg 29 i
0683	Embarkation arrangement for rescue boats	General	S74-83 Chap III Reg 16
			S74-83 Chap III Reg 11
		Passenger ship	S74-83 Chap III Reg 22 2
0684	Means of recovery of life saving appliances	Survival craft	S74 Chap III Reg 29 j,l
			S74 Chap III Reg 36 i,k
			S74-83 Chap III Reg 15
		Rescue boats	S74-83 Chap III Reg 16
0686	Buoyant apparatus	Construction	S74 Chap III Reg 33 a
		Stowage	S74 Chap III Reg 29 a iv
		Number (Passenger ship)	S74 Chap III Reg 27 c vi
		Carrying capacity	S74 Chap III Reg 33 b
		Marking	S74 Chap III Reg 20 b,e
0690	Line-throwing appliance	Line-throwing appliance	S74 Chap III Reg 23
			S74-83 Chap III Reg 17
			S74-83 Chap III Reg 49
0695	On board training and instructions	Training manual	S74-83 Chap III Reg 18 2
		Emergency instructions	S74-83 Chap III Reg 53
		Emergency instructions	S74-83 Chap III Reg 8 2
		Training manual	S74-83 Chap III Reg 51
		Practice musters and drills	S74-83 Chap III Reg 18 3
0695	On board training and insturctions	Practice musters and drills	S74 Chap III Reg 26
		Training in use	S74-83 Chap III Reg 18 4
			S74 Chap III Reg 18
		Practice musters and drills	S74-83 Chap III Reg 25
0696	Record of inspection/maintenance	Record of inspection	S74-83 Chap III Reg 52 7
		Maintenance	S74-83 Chap III Reg 19 3,4
			S74-83 Chap III Reg 52
		Record of inspection	S74 Chap III Reg 26 a iv
0699	Other	Other	

Code	Category	Description	Cite
	Fire Fighting Appliances		
0710	Fire prevention	Location/separation of spaces (Cargo ship)	S74-89 Chap II-2 Reg 44 S74-81 Chap II-2 Reg 44
		Location/separation of spaces (Cargo ship >=4000 tons)	S60 Chap II Reg 54 e
		Location/separation of spaces (Passenger ship; other-cars)	S74-89 Chap II-2 Reg 38 S74-81 Chap II-2 Reg 38
		Location/separation of spaces (Tanker)	S74 Chap II-2 Reg 56,57
		Location/separation of spaces (Passenger ship <=36; accom. + service)	S74 Chap II-2 Reg 40
		Fire patrol (Passenger ship >36)	S74-81 Chap II-2 Reg 40 6
		Location/separation of spaces (Passenger ship <=36; accom. vs. other)	S74 Chap II-2 Reg 39
		Location/separation of spaces (Passenger ship; special category)	S74-81 Chap II-2 Reg 37 1 1.1
		Location/separation of spaces (Tanker)	S74-81 Chap II-2 Reg 56,58 S74-83 Chap II-2 Reg 56 S74-89 Chap II-2 Reg 56,58
		Fire patrol (Passenger ship >36)	S74 Chap II-2 Reg 32 a i
		Fire patrol (Passenger ship <=36)	S74 Chap II-2 Reg 47 a
		Fire patrol (Passenger ship; special category)	S74-81 Chap II Reg 37 1 1.4.1 S74-83 Chap II-2 Reg 37 1 1.4.1
		Location/separation of spaces (Passenger ship <=36; accom. vs. other)	S60 Chap II Reg 53
		General structure (Cargo ship >=4000 tons)	S60 Chap II Reg 54
		Fire patrol (Passenger ship)	S60 Chap II Reg 64 a i
		General structure (Tanker)	S74-81 Chap II-2 R57 juncto 42,43
		General structure (Passenger ship >36)	S60 Chap II Reg 36
		General structure (Passenger ship >36)	S74 Chap II-2 Reg 17
		General structure (Passenger ship)	S74-81 Chap II-2 R23,24,25
		General structure (Passenger ship <=36)	S60 Chap II Reg 53 S74 Chap II-2 Reg 35
		General structure (Cargo ship)	S74-81 Chap II-2 Reg 42,43
		General structure (Tanker)	S74 Chap II-2 Reg 57
		General structure	ILO134 Art 4 3 f
		Location/separation of spaces (Passenger ship >36; other-cars)	S74 Chap II-2 Reg 31
		Division - main zones (Passenger ship >36)	S60 Chap II Reg 37 S74 Chap II-2 Reg 18
		Division - main zones (Passenger ship)	S74-81 Chap II-2 Reg 24,25
		Division - main zones (Passenger ship <=36	S60 Chap II Reg 53
		Division - main zones (Passenger ship <=36)	S74 Chap II-2 Reg 36 S74-81 Chap II-2 Reg 24,25
		Location/separation of spaces (Passenger ship >36; accom. vs. other)	S60 Chap II Reg 40
		Location/separation of spaces (Passenger ship >36; special category)	S74 Chap II-2 Reg 30
		General structure (Cargo ship <=4000 tons)	S74 Chap II-2 Reg 51
0711	Inert gas system	Inert gas system	S74-83 Chap II-2 Reg 62 14 1 S74-89 Chap II-2 Reg 62 1,19(1,2) S74 Chap II-2 Reg 62 S60 Chap II Reg 58 d S74-81 Chap II-2 Reg 60,62

Code	Category	Description	Cite
Fire Fighting Appliances - continued			
0715	Detection	Cargo spaces/dangerous goods	S74-89 Chap II-2 Reg 40 2
		Automatic alarm and detection (Cargo ship)	S74-81 Chap II-2 Reg 52 2,3,4 S74-83 Chap II-2 Reg 52 1,3
		Special spaces/alarm and detection (Passenger ship >36; unattend mach. space)	S74 Chap II-2 Reg 32 L ii
		Special spaces/alarm and detection (Pass./cargo ship; unattend mach space)	S74-81 Chap II-2 Reg 14
		Special category spaces/automatic detection (Passenger ship >36)	S74 Chap II-2 Reg 30 d i
		Special category spaces/automatic detection (Passenger ship)	S74-81 Chap II-2 Reg 37 1 1.4.1 S74-83 Chap II-2 Reg 37 1 1.4.1
		Other cargo spaces (Passenger ships >36; cars)	S74 Chap II-2 Reg 31 a
		Other cargo spaces (Passenger ship; cars)	S74-81 Chap II-2 Reg 38 1 S74-89 Chap II-2 Reg 38 1
		Other cargo spaces (Cargo ship; cars)	S74-81 Chap II-2 Reg 53 3
		Fire detection/alarm (Cargo ship; accommodation and service spaces)	S74-83 Chap II-2 Reg 52
		Cargo spaces/dangerous goods	S74-81 Chap II-2 Reg 40 2 S74-81 Chap II-2 Reg 54 2 2.3 S74-89 Chap II-2 Reg 54 2 2.3
		Cargo spaces RO/RO (cargo ship)	S74-81 Chap II-2 Reg 53 2 2.1 S74-89 Chap II-2 Reg 54 2 2.1
		Smoke detection/fire detection (Cargo ship; explosives)	S60 Chap II Reg 65 f iv(2) S74 Chap II-2 Reg 52 f iii(2)
		Fire detection/alarm (Passenger ship <=36; accommodation and service spaces)	S74 Chap II-2 Reg 40 b ii
		Fire detection/alarm (Cargo ship; accommodation and service spaces)	S74-81 Chap II-2 Reg 52
		Automatic alarm and detection (Cargo ship)	S74-89 Chap II-2 Reg 13-1
		Automatic alarm and detection (Passenger	S74-83 Chap II-2 Reg 36 1
		Other cargo spaces (Cargo ship; cars)	S74-89 Chap II-2 Reg 53 3
		General (Cargo ship)	S74-81 Chap II-2 Reg 52
		General (Passenger ship)	S60 Chap II Reg 61 S74-81 Chap II-2 Reg 36 S74-83 Chap II-2 Reg 36
		General (Passenger ship >36)	S74 Chap II-2 Reg 29
		Automatic alarm and detection (Passenger	S74-81 Chap II-2 Reg 40 2
		General (Cargo ship)	S60 Chap II Reg 61
		Automatic alarm and detection (Cargo ship)	S74-81 Chap II-2 Reg 13
		General (Cargo ship)	S74-83 Chap II-2 Reg 52
		Automatic sprinkler/alarm and detection (Passenger ship >36; method II)	S60 Chap II Reg 51
		Automatic sprinkler/alarm and detection (Passenger ship/cargo ship)	S74 Chap II-2 Reg 12
		Automatic sprinkler/alarm and detection (Passenger ship)	S74-81 Chap II-2 Reg 36 1.1 juncto R12) S74-83 Chap II-2 Reg 36
		Automatic sprinkler/alarm and detection (Cargo ship)	S74-83 Chap II-2 Reg 52 2
		Automatic alarm and detection (Passenger ship >36; method III)	S60 Chap II Reg 52
		Automatic alarm and detection (Passenger ship >36)	S74 Chap II-2 Reg 13 a,b,c,d,e,f,g,h
		Automatic alarm and detection (Passenger ship <=36)	S74 Chap II-2 Reg 13 i,j,k
		Automatic alarm and detection (Passenger	S74-81 Chap II-2 Reg 36 1,2 S74-81 Chap II-2 Reg 13
		Automatic alarm and detection (Cargo ship)	S74 Chap II-2 Reg 13 i,k

Code	Category	Description	Cite
		Automatic alarm and detection (Passenger	S74-89 Chap II-2 Reg 13-1

Code	Category	Description	Cite
Fire Fighting Appliances - continued			
0715	Detection	General (Passenger ship <=36)	S74 Chap II-2 Reg 47
		Automatic alarm and detection (Passenger ship)	S74-83 Chap II-2 Reg 40 2 S74-89 Chap II-2 Reg 40 2
		Automatic sprinkler/alarm and detection (Cargo ship)	S74-81 Chap II-2 Reg 52 2 juncto R12
0720	Fire fighting equipment	Ready availability	S60 Chap II Reg 66 S74 Chap II-2 R15,2(g) S74-81 Chap II-2 R21,2(2.7)
0725	Fixed fire extinguishing installation	Fixed foam - Fixed high-ex machinery spaces	S74-81 Chap II-2 Reg 9
		Fixed deck foam (Tanker)	S74-81 Chap II-2 Reg 60,61
		Fixed deck foam (Tank & combination carrier)	S74P78 Chap II-2 Reg 60 S74 Chap II-2 Reg 60,61
		Fixed pressure water-spraying - Cargo spaces/dangerous goods	S74-81 Chap II-2 Reg 54 2 2.1.1, 2.9
		Fixed pressure water-spraying - Special category spaces (Passenger ship >36)	S74 Chap II-2 Reg 30 c
		Fixed pressure water-spraying - Special category spaces (Passenger ship)	S74-81 Chap II-2 Reg 37 1 1.3
		Fixed pressure water-spraying - Machinery spaces	S74-81 Chap II-2 Reg 63 1 1.3 S74-81 Chap II-2 Reg 10 S74 Chap II-2 Reg 11 S60 Chap II Reg 62
		Fixed foam - Fixed lo-ex machinery spaces	S74-81 Chap II-2 Reg 8
		Fixed gas - Cargo spaces, RO/RO (cargo ship)	S74-81 Chap II-2 Reg 53 2 2.2.1
		Fixed foam - Fixed hi-ex machinery spaces	S74 Chap II-2 Reg 10
		Fixed gas - Gas/steam/CO2	S60 Chap II Reg 58 S74 Chap II-2 Reg 8
		Fixed gas - Halogen/CO2 (Tanker)	S74-81 Chap II-2 Reg 63 1
		Fixed gas - Cargo spaces, RO/RO (cargo ship)	S74-83 Chap II-2 Reg 53 2 2.2.1
		Fixed pressure water-spraying -, Cargo spaces RO/RO (Cargo ship)l	S74-81 Chap II-2 Reg 53 2 2.2.2
		Fixed gas - Cargo spaces, RO/RO (Cargo ship)	S74-81 Chap II-2 Reg 39 3
		Fixed gas - Other cargo spaces (cars)	S74-81 Chap II-2 Reg 53 3 S74-89 Chap II-2 Reg 53 3
		Fixed gas (Tanker >=2000 tons)	S74-81 Chap II-2 Reg 60
		Fixed foam - fixed foam	S60 Chap II Reg 60
		Fixed foam - machinery spaces	S74 Chap II-2 Reg 9
		Fixed gas - Gas/steam/halogen/CO2	S74-81 Chap II-2 Reg 5
0730	Appliances (general equipment)	Special requirements - Dangerous goods	S74-81 Chap II-2 Reg 54 2 2.7
		Fire extinguishers - Requirements (Passenger ship)	S74-81 Chap II-2 Reg 38 2 3
		Fire extinguishers - General	S74 Chap II-2 Reg 7 S74-81 Chap II-2 Reg 6
		Fire extinguishers - Requirements (Passenger ship)	S60 Chap II Reg 64 e,g S74-81 Chap II-2 Reg 7 S74-81 Chap II-2 Reg 37 1 1.5
		Fire extinguishers - Requirements	S74 Chap II-2 Reg 32

Code	Category	Description	Cite
Fire Fighting Appliances - continued			
0730	Appliances (general equipment)	(Passenger ship >36)	e,g(iii),h(ii)(iii) S74-81 Chap II-2 Reg 7 6
		Fire extinguishers - Requirements (Passenger ship <=36)	S74 Chap II-2 Reg 47 e,g(ii),h(ii)
		Fire extinguishers - Requirements (Cargo ship)	S60 Chap II Reg 65 e
		Fire extinguisher - Requirements (Cargo ship)	S74 Chap II-2 Reg 52 e,g(ii)h(ii)
		Fire extinguishers - General	S60 Chap II Reg 57
		Fire extinguishers - Requirements (Cargo ship)	S74-81 Chap II-2 Reg 53 2.2
		Fire hydrant/hose/nozzle - Requirements (Passenger ship <=36)	S74 Chap II-2 Reg 47 c
		Fire extinguishers - Requirements (Cargo ship)	S74-81 Chap II-2 Reg 7
		Fire hydrant, hose, nozzle - Number/position hydrant	S60 Chap II Reg 56 d
		Fire hydrant, hose, nozzle - General	S60 Chap II Reg 56 e,f,g S74 Chap II-2 Reg 5 e,f,g
		Fire hydrant/hose/nozzle - Requirements (Cargo ship)	S74 Chap II-2 Reg 52 c
		Fire hydrant, hose, nozzle - General	S74-89 Chap II-2 Reg 4 7 7.1
		Fire hydrant/hose/nozzle - Requirements (Cargo ship)	S74-89 Chap II-2 Reg 4
		Fire hydrant, hose, nozzle - Number/position hydrant	S74 Chap II-2 Reg 5 d S74-81 Chap II-2 Reg 4 5
		Fire hydrant/hose/nozzle - Requirements (Passenger ship)	S60 Chap II Reg 64 c S74-81 Chap II-2 Reg 4 S74-89 Chap II-2 Reg 4
		Fire hydrant/hose/nozzle - Requirements (Passenger ship >36)	S74 Chap II-2 Reg 32 c
		Fire hydrant/hose/nozzle - Requirements (Cargo ship)	S60 Chap II Reg 65 c S74-81 Chap II-2 Reg 4
		Fire hydrant, hose, nozzle - General	S74-81 Chap II-2 Reg 4 6,7,8
0735	Personal equipment	Fireman's outfit - Number (Passenger ship >36)	S74 Chap II-2 Reg 32 m
		Fireman's outfit - Number (Cargo ship; dangerous goods)	S74-81 Chap II-2 Reg 54 2 6
		Fireman's outfit - Number (Cargo ship)	S74-81 Chap II-2 Reg 17 3 S74 Chap II-2 Reg 52 j S60 Chap II Reg 65 j
		Fireman's outfit - Number (Tanker)	S74-81 Chap II-2 Reg 17 3
		Fireman's outfit - Number (Passenger ship >36)	S74-81 Chap II-2 Reg 17 3 2
		Fireman's outfit - Number (Passenger ship)	S60 Chap II Reg 64 i
		Fireman's outfit - General	S74-81 Chap II-2 Reg 17 1,2 S74 Chap II-2 Reg 14 S60 Chap II Reg 63
		General	ILO134 Art 4 3 i
		Fireman's outfit - Number (Passenger ship <=36)	S74 Chap II-2 Reg 47 j
		Fireman's outfit - Number (Passenger ship)	S74-81 Chap II-2 Reg 17 3

Code	Category	Description	Cite
Fire Fighting Appliances - continued			
0740	Pumps	Fire pumps special (Cargo ship)	S74-81 Chap II-2 Reg 4 3 S74-89 Chap II-2 Reg 4 3 3.2.5 S74 Chap II-2 Reg 52 b S60 Chap II Reg 65 b
		Fire pumps special (Passenger ship <=36)	S74 Chap II-2 Reg 47 b
		Fire pumps special (Passenger ship >36)	S74 Chap II-2 Reg 32 b
		Fire pumps general	S60 Chap II Reg 56 a,b,c
		Fire pumps special (Passenger ship)	S74-81 Chap II-2 Reg 4 3
		Fire pumps special (Passenger ship)	S60 Chap II Reg 64 b
		Fire pumps general	S74-81 Chap II-2 Reg 4 1,2,4 S74 Chap II-2 Reg 5 a,b,c
		Fire pumps special (Passenger ship)	S74-89 Chap II-2 Reg 4 3 3.2.5
		Fire pumps special (Cargo ship; dangerous goods)	S74-81 Chap II-2 Reg 54 2 2.1.1
0745	Ventilation, fire-dampers, valves,	Stopping power ventilation - Special spaces quick-closing devices, means of control	S74-81 Chap II-2 Reg 53 2,3 (Cargo ship; other-cars)
		Stopping power ventilation - Special spaces (Cargo ship; RO/RO spaces)	S74-81 Chap II-2 Reg 53 2 3
		Stopping power ventilation - Special spaces (Passenger ship; other-cars)	S74-81 Chap II-2 Reg 38 3
		Stopping power ventilation - Special spaces (Passenger ship >36; other spaces)	S74 Chap II-2 Reg 31 c
		Stopping power ventilation - Special spaces (Passenger ship; special cat.)	S74-81 Chap II-2 Reg 37 1 6
		Stopping power ventilation - Special spaces (Passenger ship >36; special cat.)	S74 Chap II-2 Reg 30 f
		Stopping power ventilation - Cargo spaces (Cargo ship)	S60 Chap II Reg 69 a
		Stopping power ventilation - Machinery spaces (Cargo ship)	
		Stopping power ventilation - Cargo spaces (Passenger ship)	
		Stopping power ventilation - Machinery spaces (Tanker)	S74 Chap II-2 Reg 57 xiii
		Stopping power ventilation - Machinery spaces (Cargo ship)	S74-81 Chap II-2 Reg 15 2 2 S74-81 Chap II-2 Reg 11 4,5,6
		Means of control - Special spaces (Cargo ship; other-cars)	S74-89 Chap II-2 Reg 53 3
		Stopping power ventilation - Special spaces (Cargo ship; other-cars)	
		Means of control - Machinery spaces (Cargo ship)	S74 Chap II-2 Reg 54
		Stopping power ventilation - Machinery spaces (Tanker)	S74-81 Chap II-2 Reg 15 2 2
		Means of control - Machinery spaces (Passenger ship >36)	S74 Chap II-2 Reg 34 d
		Stopping power ventilation - Machinery spaces (Passenger ship <=36)	S74-81 Chap II-2 Reg 11 4,5,6
		Means of control - Special spaces (Cargo ship; other-cars)	S74-81 Chap II-2 Reg 53 3
		Means of control - Special spaces (Cargo ship; RO/RO spaces)	S74-81 Chap II-2 Reg 53 2 3
		Means of control - Special spaces (Passenger ship; other-cars)	S74-81 Chap II-2 Reg 38 3 1
		Means of control - Special spaces (Passenger ship; special category)	S74-81 Chap II-2 Reg 37 1 6
		Means of control - Machinery spaces (Cargo ship)	S74-81 Chap II-2 Reg 11

Code	Category	Description	Cite
Fire Fighting Appliances - continued			
0745	Ventilation, fire-dampers, valves,	Means of control - Machinery spaces (Passenger ship <=36)	S74 Chap II-2 Reg 50
		Means of control - Machinery spaces (Passenger ship >36)	S74-81 Chap II-2 Reg 32 1 6
		Stopping power ventilation - Special spaces (Dangerous goods spaces)	S74-81 Chap II-2 Reg 54 2 4
		Means of control - Machinery spaces (Passenger ship)	S74-81 Chap II-2 Reg 11 S60 Chap II Reg 69 a
		Stopping power ventilation - Special spaces (Tanker; cargo + adjacent)	S74-83 Chap II-2 Reg 59 3 3 S74-81 Chap II-2 Reg 59 3 3
		Stopping power ventilation - Special spaces (Tanker; cargo pumproom)	S74-81 Chap II-2 Reg 59 3 1 S74 Chap II-2 Reg 58 c
		Means of control - Machinery spaces (Cargo ship)	S60 Chap II Reg 69 a
		Ventilation - General (Passenger ship<=36)	S74-81 Chap II-2 R32 juncto R16 2
		Fire dampers (Passenger ship <=36; auto. fail-safe)	S74-81 Chap II-2 Reg 32 2 S74 Chap II-2 Reg 37 b
		Fire dampers (Passenger ship >36; auto. fail-safe)	S74-81 Chap II-2 Reg 32 1 1 S74 Chap II-2 Reg 23 b
		Fire dampers (Passenger ship <=36; local control)	S60 Chap II Reg 53
		Main inlet/outlet vent. system (Passenger ship >36)	S60 Chap II Reg 47 a
		Ventilation - General (Cargo ship)	S74-81 Chap II-2 R48 juncto R16
		Main inlet/outlet vent. system (Passenger ship >36)	S74 Chap II-2 Reg 25 c
		Ventilation - General (Passenger ship <=36)	S74 Chap II-2 Reg 45
		Ventilation - General (Passenger ship >36)	S74-81 Chap II-2 R32 juncto R16 1 S74 Chap II-2 Reg 25 S60 Chap II Reg 47
		Stopping power ventilation - Machinery spaces (Cargo ship)	S74 Chap II-2 Reg 51 h
		Stopping power ventilation - Machinery spaces quick-closing devices, means of control (Passenger ship <=36)	S74 Chap II-2 Reg 50 a
		Fire dampers (Passenger ship >36; local control)	S60 Chap II Reg 38 b
		Stopping power ventilation - General (Passenger ship >36)	S74-81 Chap II-2 Reg 32 1 6
		Stopping power ventilation - Machinery spaces (Passenger ship <=36)	S74 Chap II-2 Reg 45
		Stopping power ventilation - Machinery spaces (Passenger ship >36)	S74-81 Chap II-2 Reg 11 4,5,6 S74-81 Chap II-2 Reg 32 1 6 S74 Chap II-2 Reg 34 d iv,v
		Stopping power ventilation - Machinery spaces (Passenger ship)	S74-81 Chap II-2 Reg 15 2 2 S60 Chap II Reg 69 a
		Fire dampers (Cargo ship)	S74-81 Chap II-2 Reg 48
		Stopping power ventilation - General (Passenger ship <=36)	S74-81 Chap II-2 Reg 32 2
		Main inlet/outlet vent. system (Passenger ship >36)	S74-81 Chap II-2 Reg 32 1 1

Code	Category	Description	Cite
Fire Fighting Appliances - continued			
0745	Ventilation, fire-dampers, valves,	Stopping power ventilation - General (Passenger ship >36)	S74 Chap II-2 Reg 25 f
		Stopping power ventilation - General (Passenger ship)	S60 Chap II Reg 47 b
		Main inlet/outlet vent. system (Tanker)	S74-81 Chap II-2 Reg 59 3 2 S74 Chap II-2 Reg 58 b
		Main inlet/outlet vent. system (Cargo ship)	S74-81 Chap II-2 Reg 16 9
		Main inlet/outlet vent. system (Passenger ship <=36)	S74-81 Chap II-2 Reg 32 2 1
		Stopping power ventilation - General (Cargo ship)	S74-81 Chap II-2 Reg 48
0750	International shore-connection	Requirement (Passenger ship <=36 and >=1000 grt)	S74 Chap II-2 Reg 47 d
		General	S60 Chap II Reg 56 h
		Requirement (Cargo ship >=1000 grt)	S74 Chap II-2 Reg 52 d
		Requirement (Cargo ship)	S60 Chap II Reg 65 d
		Requirement (Passenger ship)	S60 Chap II Reg 64 d
		General	S74-81 Chap II-2 Reg 19 S74 Chap II-2 Reg 5 h
		Requirement (Passenger ship >36 and >=1000grt)	S74 Chap II-2 Reg 32 d
0799	Other		
Accident Prevention			
0810	Personal equipment	Personal equipment	ILO134 Art 4 3 i
0820	Protection machines/parts	Protection machines/parts	ILO134 Art 4 3 a,d S74-81 Chap II-1 Reg 26 1
0830	Pipes, wires (insulation)	Pipes, wires (insulation)	ILO134 Art 4 3 a,d
0899	Other	Structural features (ship)	ILO134 Art 4 3 b
		Entry dangerous spaces (instructions,	ILO134 Art 4 3 a,d

Code	Category	Description	Cite
Safety in General			
0910	Hydraulic and other closing	Fire dampers (Passenger ship >36) devices/watertight doors	S60 Chap II Reg 38 b
		Main vertical zone - Stairway enclosure (Tanker)	S74 Chap II-2 Reg 57 b vii
		Main vertical zone - Doors within S60 Chap II Reg 39 a i (Passenger	ship >36; method I)
		Fire dampers (Cargo ship)	S74-81 Chap II-2 Reg 16 2,3,4,5,6,7
		Main vertical zone - Doors within	S60 Chap II Reg 39 b i s(Passenger hip >36; method III)
		Main vertical zone - Stairway enclosure (Cargo ship)	S74-81 Chap II-2 Reg 46
		Main vertical zone - Doors within (Passenger ship >36)	S74 Chap II-2 Reg 19 b ii
		Main vertical zone - Doors within (Passenger ship)	S74-81 Chap II-2 Reg 25 2 2
		Doors in fire resisting divisions (Cargo ships)	S74-81 Chap II-2 Reg 47
		Fire dampers (Passenger ship >36)	S74 Chap II-2 Reg 23 b S74-81 Chap II-2 Reg 16 2,3,4,5,6,7,8
		Fire dampers (Passenger ship <=36)	S60 Chap II Reg 53 S74 Chap II-2 Reg 37 b S74-81 Chap II-2 Reg 16 2,3,4,5,6,7,8
		Fire dampers (Cargo ship)	S74 Chap II-2 Reg 54 a
		Fire dampers (Tanker)	S74 Chap II-2 Reg 57 d
		Watertight doors - General (Passenger ship)	S74-89 Chap II-1 Reg 15
		Main vertical zone - Stairway enclosure (Passenger ship <=36)	S74 Chap II-2 Reg 37 f
		Fire dampers (Cargo ship)	S60 Chap II Reg 69 a
		Construction/test	S74-81 Chap II-1 Reg 18
		Construction/test (Passenger ship)	S60 Chap II Reg 15
		Main vertical zone - stairway enclosure (Passenger ship)	S74-81 Chap II-2 Reg 30 4
		Watertight doors - General (Passenger ship)	S74-81 Chap II-1 Reg 15
		Watertight doors - General; devices/watertight doors Cargo 2,3,4 loading doors) (Passenger ship)	S74-88 Chap II-1 Reg 20-1
		Watertight doors - General (Passenger ship)	S60 Chap II Reg 13
		Construction/test	S74 Chap II-1 Reg 15
		Watertight doors - General (Passenger ship)	S74 Chap II-1 Reg 13
		Construction/test (Cargo ship)	S74-81 Chap II-1 Reg 18 2
		Marking/periodic operation & inspection (Passenger ship)	S60 Chap II Reg 21
		Main vertical zone - Fire doors (Passenger ship <=36)	S74 Chap II-2 Reg 37 f
		Main vertical zone - Stairway enclosure (Passenger ship >36)	S74 Chap II-2 Reg 23 f S60 Chap II Reg 42 a iii
		Marking/periodic operation & inspection (Passenger ship)	S74 Chap II-1 Reg 21
		Main vertical zone - Fire doors (Passenger ship <=36)	S60 Chap II Reg 53
		Main vertical zone - fire doors) (Passenger ship	S74-81 Chap II-2 Reg 30 4
		Main vertical zone - Fire doors (Passenger ship >36)	S74 Chap II-2 Reg 23 f S60 Chap II Reg 38 e

Code	Category	Description	Cite
		Marking/periodic operation & inspection (Passenger ship)	S74-81 Chap II-1 Reg 24

Code	Category	Description	Cite
Safety in General			
0915	Signs, indications	Sprinkler indicator (Passenger ship)	S60 Chap II Reg 59
		Fire detector indicator - Unattended machinery spaces	S74-81 Chap II-2 Reg 14
		Sprinkler indicator (Passenger ship)	S74-81 Chap II-2 Reg 12 1 2.1
		Sprinkler indicator (Cargo ship)	S74 Chap II-2 Reg 12 a ii S74-81 Chap II-2 Reg 12 1 2.2
		Ventilation indicator (Cargo ship; RO/RO	S74-81 Chap II-2 Reg 53 2 3.3
		Fire damper indicator (Passenger ship >36)	S60 Chap II Reg 38 b
		Sprinkler indicator (Passenger ship)	S74 Chap II-2 Reg 12 a ii
		Fire damper indicator (Passenger ship >36)	S74 Chap II-2 Reg 23 b
		Fire damper indicator (Passenger ship)	S74-81 Chap II-2 Reg 16 8
		Fire damper indicator	S60 Chap II Reg 53
		(Passenger ship <=36)	S74 Chap II-2 Reg 37 b
		Fire damper indicator (Cargo ship)	S74-81 Chap II-2 Reg 16 2 2
		Ventilation indicator (Passenger ship >36; special category space)	S74 Chap II-2 Reg 30 f iii
		Ventilation indicator (Passenger ship; special category space)	S74-81 Chap II-2 Reg 37 1 6.3
		Ventilation indicator (Passenger ship; other-cars)	S74-81 Chap II-2 Reg 38 3 3
		Watertight doors indicator (Passenger ship)	S74-89 Chap II-1 Reg 15 9 3
		Fire detector indicator (Cargo ship)	S74-81 Chap II-2 Reg 13 1 6
		Ventilation indicator (Passenger ship >36; other-cars)	S74 Chap II-2 Reg 31 c iii
		Watertight doors indicator (Passenger ship)	S74-89 Chap II-1 Reg 15 7 3.1,3.2
		Watertight doors indicator (Passenger ship; special category space)	S74-88 Chap II-1 Reg 23-2 1,2
		Fire detector indicator (Cargo ship)	S74 Chap II-2 Reg 13 i
		Watertight door indicator (Passenger ship)	S60 Chap II Reg 13 b,i S74 Chap II-1 Reg 13 b,i
		Watertight doors indicator (Passenger ship)	S74-81 Chap II-1 Reg 15 6 5 S74-81 Chap II-1 Reg 15 9 S74-89 Chap II-1 Reg 15 7 1.6 S74-89 Chap II-1 Reg 15 7 7 S74-89 Chap II-1 Reg 15 8 2
		Watertight doors indicator (Passenger ship; special category space)	S74-81 Chap II-2 Reg 37 1 2.2
		Watertight doors indicator (Cargo ship; dry cargo)	S74-89 Chap II-1 Reg 23-1 2
		Fire detector indicator (Passenger ship)	S60 Chap II Reg 61 S74-81 Chap II-2 Reg 13 1 6
		Fire detector indicator (Passenger ship >36)	S74 Chap II-2 Reg 13 a ii
		Fire detector indicator (Passenger ship <=36)	S74 Chap II-2 Reg 13 i
		Fire detector indicator (Cargo ship)	S60 Chap II Reg 61 a,c
		Watertight doors indicator (Passenger ship)	S74-89 Chap II-1 Reg 15 6 4
0920	Safety plans	Damage control plan (Passenger ship)	S74 Chap II-2 Reg 20
		Fire control plans - all ships	S60 Chap II Reg 70
		Fire control plan - all ships	S74-81 Chap II-2 Reg 20 S74 Chap II-2 Reg 4
		Damage control plan (Passenger ship)	S74-81 Chap II-1 Reg 23 S60 Chap II Reg 20
		Damage control plan (Cargo ship; dry cargo)	S74-89 Chap II-1 Reg 23-1 1

Code	Category	Description	Cite
Safety in General			
0925	Muster and drills	Practice muster/drill - Lifesaving (all ships)	S74 Chap III Reg 26
		Drill watertight doors (Passenger ship)	S74-81 Chap II-1 Reg 24
			S74 Chap II-1 Reg 21
			S60 Chap II Reg 21
		Practice muster/drill - Lifesaving (all ships)	S74-83 Chap III Reg 18 3,4
			S60 Chap III Reg 26
		Muster list	S74-83 Chap III Reg 53
			S74-83 Chap III Reg 8
			S74 Chap III Reg 25
			S60 Chap III Reg 25
		Practice muster/drill - Lifesaving (Passenger ship)	S74-83 Chap III Reg 25
0930	Stability and strength	Damaged condition (Passenger ship)	S74 Chap II-1 Reg 7
		S74-88 Chap II-1 Reg 8	
		Timber deck cargo	LL66 Annex I Reg 44 10
		Grain carriage (intact stability)	S74 Chap VI Reg 4
		Damaged condition (Passenger ship)	S74-81 Chap II-1 Reg 8
		Information (all ships)	S74-88 Chap II-1 Reg 22
			S74-81 Chap II-1 Reg 22
			S74 Chap II-1 Reg 19
			S60 Chap II Reg 19
		Timber deck cargo	LL66P88 Annex I Reg 44 7
		Damaged condition (Passenger ship)	S60 Chap II Reg 7
0936	Steering gear	Electric/eletro-hydraulic	S60 Chap II Reg 30
		Testing and drills	S74-81 Chap V Reg 19-2
			S74-81 Chap V Reg 19
			S74P78 Chap V Reg 19-2
			S74P78 Chap V Reg 19
		Operation	S74-81 Chap V Reg 19-1
			S74P78 Chap V Reg 19-1
		Electric/electro-hydraulic	S74 Chap II-1 Reg 30
		General (Tankers>=10,000 tons)	S74P78 Chap II-1 Reg 29
		General	S74-81 Chap II-1 Reg 29
			S74 Chap II-1 Reg 29
			S60 Chap II Reg 29
		Operation	S74 Chap V Reg 19
0938	Hull damage impairing seaworthiness	Tanker (type A)	LL66 Annex I Reg 27 3
		Cargo ship	LL66P88 Annex I Reg 27 8 d
			LL66P88 Annex I Reg 27 10
		Tanker (type A)	LL66P88 Annex I Reg 27 3
		Passenger ship	S74-81 Chap II-1 Reg 8
			S74 Chap II-1 Reg 7
		Cargo ship	LL66 Annex I Reg 27 7
		Passenger ship	S74-88 Chap II-1 Reg 8 2,6,7

Code	Category	Description	Cite
Safety in General			
0940	Ballast, fuel and other tanks	Double bottom (Cargo ship; other than tanker)	S74-89 Chap II-1 Reg 12-1
		Fuel, Lube and other flammable) oil (All ships	S74-89 Chap II-2 Reg 15 S74-83 Chap II-2 Reg 15 S74-81 Chap II-2 Reg 15
		Fuel, lube and other flammable oil (Passenger ship >36))	S74 Chap II-2 Reg 33
		Double bottom - Grain carriage	S60 Chap VI Reg 13
		Double bottom (Passenger ship)	S74-89 Chap II-1 Reg 12 5 S74-81 Chap II-1 Reg 12 S74 Chap II-1 Reg 10 S60 Chap II Reg 10
		Ballast general (Passenger ship)	S74-81 Chap II-1 Reg 9 S74 Chap II-1 Reg 8 S60 Chap II Reg 8
		Double bottom - Timber	LL66 Annex I Reg 43 2
0945	Emergency lighting, batteries and switches	Source and supply to misc safety services (Passenger ship; Special cat. spaces)	S74-88 Chap II-1 Reg 42-1
		Source and supply to misc safety services (Passenger ship)	S60 Chap II Reg 25 S74 Chap II-1 Reg 25 S74-81 Chap II-1 Reg 25 S74-83 Chap II-1 Reg 42 2
		Source and supply to misc safety services (Passenger ship; RO/RO spaces)	S74-88 Chap II-1 Reg 42-1
		Source and supply to misc safety services (Cargo ship)	S60 Chap II Reg 26 S74 Chap II-1 Reg 26 S74-81 Chap II-1 Reg 43 S74-83 Chap II-1 Reg 43 2 1
		Starting arrangements for generating set (Passenger ship)	S60 Chap II Reg 25 c i S74 Chap II-1 Reg 25 c i S74-81 Chap II-1 Reg 44
		Starting arrangements for generating set (Cargo ship >=5000 tons)	S60 Chap II Reg 26 a iii S74 Chap II-1 Reg 26 a iii
		Starting arrangements for generating set (Cargo ship)	S74-81 Chap II-1 Reg 44
		Source and supply to misc safety services (Passenger ship)	S74-89 Chap II-1 Reg 42 2,4
0950	Electric equipment general	Main source (Passenger ship)	S74 Chap II-1 Reg 24
		Precaution against shock, fire, etc.	S74-81 Chap II-1 Reg 45
		Precaution against sjock, fire, etc.	S74 Chap II-1 Reg 27
		Precaution against shock, fire, etc.	S60 Chap II Reg 27
		Main source (Passenger ship)	S74-81 Chap II-1 Reg 41 S60 Chap II Reg 24
		Main source (Cargo ship)	S74-81 Chap II-1 Reg 41
0955	Pilot ladders	Ladder	S60 Chap V Reg 17 S74 Chap V Reg 17 a
		Hoist	S74 Chap V Reg 17 b

Code	Category	Description	Cite
Safety in General			
0956	Gangway, accommodation-ladder	Gangway, accommodation-ladder	ILO134 Art 4 3 a
0960	Means of escape	Cargo ship Passenger ship >36 Tanker Cargo ship Passenger ship <=36 Passenger ship Cargo ship	S74 Chap II-2 Reg 53 S74 Chap II-2 Reg 21 S74 Chap II-2 Reg 53,59 S74-81 Chap II-2 Reg 45 S74 Chap II-2 Reg 48 S60 Chap II Reg 68 a S74-81 Chap II-2 Reg 28 S60 Chap II Reg 68 b
0970	Location of emergency installations	Passenger ship	S60 Chap II Reg 32 S74 Chap II-1 Reg 31 S74-81 Chap II-1 Reg 39
0981	Beams, frames, floors-operational damage	Maintenance of condition	LL66 Art 15 LL66 Annex I Reg 1 S74P88 Chap I Reg 11 S74P78 Chap I Reg 11 S74 Chap I Reg 11 S60 Chap I Reg 11 LL66P88 Annex I Reg 1
0982	Beams, frames, floors - corrosion		S60 Chap I Reg 11 S74 Chap I Reg 11 S74P78 Chap I Reg 11 S74P88 Chap I Reg 11 LL66 Art 15 LL66 Annex I Reg 1 LL66P88 Annex I Reg 1
0983	Hull - corrosion	Maintenance of condition	LL66 Annex I Reg 1 S74P78 Chap I Reg 11 LL66P88 Annex I Reg 1 S60 Chap I Reg 11 LL66 Art 15 S74 Chap I Reg 11 S74P88 Chap I Reg 11
0984	Hull -	cracking	S60 Chap I Reg 11 S74 Chap I Reg 11 S74P78 Chap I Reg 11 S74P88 Chap I Reg 11 LL66 Art 15 LL66 Annex I Reg 1 LL66P88 Annex I Reg 11
0985	Bulkheads -	corrosion	S74P78 Chap I Reg 11 LL66P88 Annex I Reg 1 LL66 Annex I Reg 1 S74P88 Chap I Reg 11 S74 Chap I Reg 11 S60 Chap I Reg 11

Code	Category	Description	Cite
			LL66 Art 15

Code	Category	Description	Cite
Safety in General			
0986	Bulkheads -	operational damage	LL66P88 Annex I Reg 1 S60 Chap I Reg 11 S74 Chap I Reg 11 S74P78 Chap I Reg 11 S74P88 Chap I Reg 11 LL66 Art 15 LL66 Annex I Reg 1
0987	Bulkheads -	cracking	LL66 Art 15 LL66 Annex I Reg 1 LL66P88 Annex I Reg 1 S74P78 Chap I Reg 11 S60 Chap I Reg 11 S74P88 Chap I Reg 11 S74 Chap I Reg 11
0988	Decks -	corrosion	LL66P88 Annex I Reg 1 S60 Chap I Reg 11
0988	Decks - corrosion	Maintenance of condition	S74 Chap I Reg 11 S74P78 Chap I Reg 11 S74P88 Chap I Reg 11 LL66 Art 15 LL66 Annex I Reg 1
0989	Decks -	cracking	LL66P88 Annex I Reg 1 LL66 Annex I Reg 1 LL66 Art 15 S74P88 Chap I Reg 11 S74P78 Chap I Reg 11 S60 Chap I Reg 11 S74 Chap I Reg 11
0999	Other		

Code	Category	Description	Cite
	Alarm Signals		
1010	General alarm	Emergency signal (Passenger ship)	S60 Chap III Reg 26 d
		Emergency alarm (All ships)	S74 Chap III Reg 26 d
		Crew alarm (Passenger ship)	S74-81 Chap II-2 Reg 40 4
		Crew alarm (Passenger ship >36)	S74 Chap II-2 Reg 32 a v
		General alarm	S60 Chap III Reg 25 f S74-83 Chap III Reg 6 4 2 S74 Chap III Reg 25 h
		Emergency signal (All ships)	S74-83 Chap III Reg 50
1020	Fire alarm	Sprinkler alarm	S74-81 Chap II-2 Reg 12 1 2
		Detection - Alarm (Passenger ship)	S60 Chap II Reg 61 c S74-89 Chap II-2 Reg 13-1 1 6
		Detection - Alarm (Passenger ship <=36)	S74 Chap II-2 Reg 13 i
		Detection - Alarm (Cargo ship)	S60 Chap II Reg 61 c S74 Chap II-2 Reg 13 i
		Detection - Alarms (Cargo ship)	S74-81 Chap II-2 Reg 13 1 4
		Detection - Alarm (Cargo ship)	S74-89 Chap II-2 Reg 13-1 1 6
		Automatic - General (Passenger ship <=36)	S74 Chap II-2 Reg 47 a i
		Sprinkler alarm	S74 Chap II-2 Reg 12 a ii
		Detection - Alarm (Passenger ship)	S74-81 Chap II-2 Reg 13 1 4
		Fire-extinguishing gas (CO2) alarm	S60 Chap II Reg 58 f S74 Chap II-2 Reg 8 g S74-81 Chap II-2 Reg 5 1 6
		Sprinkler alarm	S60 Chap II Reg 59 b
		Manual (Passenger ship)	S60 Chap II Reg 64 a i
		General	S60 Chap III Reg 25 f S74 Chap III Reg 25 h
		Detection - Alarm (Passenger ship >36)	S74 Chap II-2 Reg 13 a i
		UMS-alarm (general)	S74-81 Chap II-1 Reg 47 1
		Automatic - General (Passenger ship >36)	S74 Chap II-2 Reg 32 a iii
		Manual (Passenger ship)	S74-81 Chap II-2 Reg 40 1 S74-83 Chap II-2 Reg 13 2 1 S74-83 Chap II-2 Reg 40 1
		Manual (Passenger ship <=36)	S74 Chap II-2 Reg 47 a i
		Manual (Cargo ship)	S74-83 Chap II-2 Reg 13 2 1
		Automatic - General (Passenger ship)	S60 Chap II Reg 64 a ii S74-89 Chap II-2 Reg 40 2 S74-81 Chap II-2 Reg 40 2
		General	S74-83 Chap III Reg 6 4
		Automatic - General (Passenger ship)	S74-83 Chap II-2 Reg 40 2
		Manual (Passenger ship>36)	S74 Chap II-2 Reg 32 a ii
1030	Steering gear alarm	Steering gear alarm	S74-81 Chap II-1 Reg 29 8 4
1040	Engineers' alarm	Engineers' alarm	S74-81 Chap II-1 Reg 38
1050	Inert gas alarm	Inert gas alarm	S74-81 Chap II-2 Reg 62 19 S74-89 Chap II-2 Reg 62 19 1,2 S74 Chap II-2 Reg 62 o
1060	Machinery controls alarm	Remote control failure	S74-81 Chap II-1 Reg 31 2 7
		Low starting air-pressure	S74-81 Chap II-1 Reg 31 2 9

Code	Category	Description	Cite
	Alarm Signals		
1070	UMS - alarms	Alarm system for pressure, temperatures, fluid levels and other parameters	S74-81 Chap II-1 Reg 53 4 3
	Fault inidicating alarm	S74-81 Chap II-1 Reg 51	
	Alarm console	S74-81 Chap II-1 Reg 53 4 4	
	Auto change-over alarm	S74-81 Chap II-1 Reg 53 4 2	
	High-temp. for heated daily service tank	S74-81 Chap II-2 Reg 15 5 3	
	Remote auto control (failure)	S74-81 Chap II-1 Reg 49 5	
	HP - oil fuel pipes	S74-81 Chap II-2 Reg 15 5 1	
	Fixed fire alarm	S74-81 Chap II-2 Reg 14 2	
1080	Boiler alarm	Boiler alarm	S74-81 Chap II-1 Reg 32 2
1099	Other	Opening/closing watertight doors alarm	S74-89 Chap II-1 Reg 15 7.1 6
		Opening/closing watertight doors alarm	S74-89 Chap II-1 Reg 15 7.3 1
			S74-89 Chap II-1 Reg 15 7.8
	Cargo		
1110	Stowage of cargo	Deck cargo (general; safe access)	ILO134 Art 4 3 a,d
1120	Grain	Longitudinal divisions and saucers	S74 Chap VI Reg 5
		Combination arrangements	S74 Chap VI Reg 8
			S60 Chap VI Reg 8
		Feeders and trunks	S60 Chap VI Reg 7
		Longitudinal divisions and saucers	S60 Chap VI Reg 4,5,6
		Stability	S74 Chap VI Reg 4
		Loading information	S74 Chap VI Reg 11
			S60 Chap VI Reg 15
		Feeders and trunks	S74 Chap VI Reg 7
1130	Stowage/packaging dangerous goods	Marking/labelling	S74 Chap VII Reg 4
		Explosives (Passenger ship)	S74-83 Chap VII Reg 7
			S74 Chap VII Reg 7
			S60 Chap VII Reg 8
		Stowage requirements	S74-83 Chap VII Reg 6
			S74 Chap VII Reg 6
			S60 Chap VII Reg 7
		Documents	S74-83 Chap VII Reg 5
			S74 Chap VII Reg 5
		Explosives (Passenger ship)	S74-89 Chap VII Reg 7
		Marking/labelling	S60 Chap VII Reg 4
		Packing	S74-83 Chap VII Reg 3
			S74 Chap VII Reg 3
			S60 Chap VII Reg 3
		Special requirements	S74-89 Chap II-2 Reg 54
			S74-83 Chap II-2 Reg 54
			S74-81 Chap II-2 Reg 54
		General (see also code 1170)	ILO134 Art 4 3 h
		Documents	S60 Chap VII Reg 5
		Marking/labelling	S74-83 Chap VII Reg 4

Code	Category	Description	Cite
	Cargo		
1135	Dangerous liquid chemicals in bulk	Application Requirements	S74-83 Chap VII Reg 9 S74-83 Chap VII Reg 10
1138	Liquefied gases in bulk Requirements	Application S74-83 Chap VII Reg 13	S74-83 Chap VII Reg 12
1140	Other cargo LL66P88 Annex I Reg 44 Timber - deck - construction (DB-tanks, bulwarks, etc.)	Stowage LL66 Annex I Reg 43	LL66 Annex I Reg 44
1150	Loading and unloading equipment Certificates, etc. SWL	Condition	ILO134 Art 4 3 e
1160	Holds and tanks	Rails/fencing No open/naked lights (Passenger ship) No open/naked lights (Tanker; gastight lighting, pumproom) No open/naked lights (Cargo ship) No open/naked lights (Passenger ship) No open/naked lights Fixed ladder Adequate lighting No open/naked lights (Passenger ship)	ILO134 Art 4 3 a,d S74-81 Chap II-1 Reg 40 S74-81 Chap II-2 Reg 58 5 S74-81 Chap II-1 Reg 40 S74 Chap II-1 Reg 23 a ii S60 Chap II Reg 23 ILO134 Art 4 3 a ILO134 Art 4 3 a,d ILO134 Art 4 3 a S74-81 Chap II-1 Reg 40 S74 Chap II-1 Reg 23 a ii
1170	Dangerous Goods Code	Dangerous Goods Code	S60 Chap VII Reg 1 d S74 Chap VII Reg 1 d S74-83 Chap VII Reg 1 4
1199	Other	Other	

Code	Category	Description	Cite
	Load Lines		
1210	Overloading	Overloading	LL66 Art 12
1220	Freeboard marks	Deck line Details of marking Lines (LL-mark) Load line mark	LL66 Annex I Reg 4 LL6 Annex I Reg 8 LL66 Annex I Reg 6 LL66 Annex I Reg 5 LL66P88 Annex I Reg 5
1230	Railing, catwalks	Condition Protection (crew) Deck cargo (access) Deck cargo (timber)	LL66 Art 14 1 c LL66P88 Annex A Art 14 1 c LL66 Annex I Reg 25 LL66 Annex I Reg 25 5 LL66 Annex I Reg 44 11 LL66P88 Annex I Reg 44 8
1240	Cargo & other hatchways	Condition	LL66 Annex I Reg 14
1250	Covers (hatchway, portable, tarpaulins)	Steel or equivalent Portable + tarpaulins + battening devices Portable + tarpaulins+ battening devices	LL66 Annex I Reg 16 LL66P88 Annex I Reg 15 LL66 Annex I Reg 15
1260	Windows, side scuttles	Windows, side scuttles	LL66P88 Annex I Reg 23 LL66 Annex I Reg 23
1270	Doors Gaskets, closing devices)	LL66 Annex I Reg 12	
1275	Ventilators, air pipes, casings	Ventilators Air pipes	LL66 Annex I Reg 19 LL66 Annex I Reg 20
1280	Machinery space openings	Machinery space openings	LL66 Annex I Reg 17
1282	Manholes/flush scuttles	Manholes/flush scuttles	LL66 Annex I Reg 18
1284	Cargo ports, etc.	Cargo ports, etc.	LL66 Annex I Reg 21
1286	Scuppers, inlets, etc.	Scuppers, inlets, etc. Reg 22	LL66 Annex I Reg 22 LL66P88 Annex I
1288	Freeing ports	Freeing ports	LL66P88 Annex I Reg 24 LL66 Annex I Reg 24
1290	Lashings (timber)	Lashings (timber)	LL66 Annex I Reg 44 6,7,8,9 LL66P88 Annex I Reg 44 4

Code	Category	Description	Cite
1299	Other	Other	

Code	Category	Description	Cite
	Mooring Arrangements		
1310	Ropes & wires	Ropes & wires	ILO134 Art 4 3 g
1320	Anchoring devices	Anchoring devices	
1330	Winches & capstans	Winches & capstans	
1340	Adequate lighting	Adequate lighting	ILO134 Art 4 3 a S74-81 Chap II-1 Reg 40
1399	Other	Other	
	Propulsion & Auxiliary Machinery		
1410	Propulsion main engine	Astern power	S74-81 Chap II-1 Reg 28
		Protection - main engine; against lube oil supply failure	S74-81 Chap II-1 Reg 27 5
		Protection - main engine; against explosion	S74-81 Chap II-1 Reg 27 4,5
		Protection - main engine; against maximum working stresses	S74-81 Chap II-1 Reg 27 3
		General	S74-81 Chap II-1 Reg 26
		Protection - main engine; against excessive pressure	S74-81 Chap II-1 Reg 27 2
		Astern power	S74 Chap II-1 Reg 28 S60 Chap II Reg 28
		Protection - main engine; against	S74-81 Chap II-1 Reg 27 1
1420	Cleanliness of engine room	Cleanliness of engine room	ILO134 Art 4 3 a S74-81 Chap II-1 Reg 26 7
1430	Auxiliary engine	Protection - auxiliary engine; against maximum working stresses	S74-81 Chap II-1 Reg 27 3
		Protection - auxiliary engine; explosion	S74-81 Chap II-1 Reg 27 5
		Protection - auxiliary engine; lube oil supply failure	
		Protection - auxiliary engine; against excessive pressure	S74-81 Chap II-1 Reg 27 2
		Protection - auxiliary engine; against overspeeding	S74-81 Chap II-1 Reg 27 1
		General	S74-81 Chap II-1 Reg 26
1440	Bilge pumping arrangements	Passenger ship	S74 Chap II-1 Reg 18 S74-81 Chap II-1 Reg 21 1,2 S74-89 Chap II-1 Reg 21 1 6 S74-89 Chap II-1 Reg 21 2 9
		Cargo ship	S74-81 Chap II-1 Reg 21 1,3 S74-89 Chap II-1 Reg 21 1 6
		Passenger ship	S60 Chap II Reg 18

Code	Category	Description	Cite
Propulsion & Auxiliary Machinery			
1450	UMS - ship	General Control of propulsion	S74-81 Chap II-1 Reg 46 S74-81 Chap II-1 Reg 49
1460	Guards/fencing around dangerous	Guards/fencing around dangerous machinery machinery parts	ILO134 Art 4 3 c S74-81 Chap II-1 Reg 26 1
1470	Insulation wetted through (oil)	General UMS - Ship	S74-81 Chap II-2 Reg 15 2 4 S74-81 Chap II-2 Reg 15 5 S74 Chap II-2 Reg 33 a (iv)(2)
1499	Other	Other	
Navigation			
1510	Equipment	Approved by the Administration - Rudder angle indicator Approved by the Administration - Pitch and operational mode indicator Approved by the Administration - Revolution counter Approved by the Administration - Log Approved by the Administration - Echo sounder Approved by the Administration - Gyro & repeater Approved by the Administration - Magnetic compass Approved by the Administration - Radar Approved by the Administration - Radar Approved by the Administration - Rate of turn indicator Approved by the Administration - Automatic radar plotting aid (ARPA)	S74-81 Chap V Reg 12 r S74P78 Chap V Reg 12 a S74 Chap V Reg 12 a S74-81 Chap V Reg 12 r
1520	Shipboard navigation equipment	Shipboard navigation equipment	S74P78 Chap V Reg 12 a S74-81 Chap V Reg 12 S74 Chap V Reg 12

Code	Category	Description	Cite
Navigation			
1530	Radar Compulsory 1x (Ships >=1600 tons)	S74 Chap V Reg 12 a	
		Plotting aid - Facilities	S74P78 Chap V Reg 12 a
		Compulsory 2x (Ships >=10,000 tons)	
		Plotting aid - Facilities	S74 Chap V Reg 12 a
		Plotting aid - Automatic radar plotting aid (ARPA)	S74-81 Chap V Reg 12 j
		Compulsory 2x (Ships >=10,000 tons)	S74-88 Chap V Reg 12 h
			S74-81 Chap V Reg 12 h
		Plotting aid - Facilities	S74-81 Chap V Reg 12 i
		Compulsory 1x (Passenger ship <300 tons))	S74-88 Chap V Reg 12 g
		Compulsory 1x (1600 tons <= ship < 10,000 tons))	S74P78 Chap V Reg 12 a
		Compulsory 1x (Ships >=1600 tons)	S74-81 Chap V Reg 12 g
		Compulsory 1x (Ships >=500 tons; constructed on/after 1 Sep 84)	S74-88 Chap V Reg 12 g
			S74-81 Chap V Reg 12 g
		Compulsory 1x (Ships >=1600 tons)	S74-88 Chap V Reg 12 g
		Compulsory 1x (300 tons <= Cargo ship < 500 tons)	
1540	Gyro compass	Gyro repeater (Ships >= 500 tons; constructed after 1 Sep 84)	S74-81 Chap V Reg 12 d i
		Gyro repeater (Ships >=1600 tons)	S74-81 Chap V Reg 12 d ii
		Ships >= 500 tons	S74-81 Chap V Reg 12 d
		Ships >= 1600 tons	S74-81 Chap V Reg 12 e
			S74 Chap V Reg 12 c
1541	Magnetic compass	Ships >=1600 tons	
		Steering compass (Ships <150 tons)	S74-81 Chap V Reg 12 c
		Steering compass (Ships >=150 tons)	S74-81 Chap V Reg 12 b i(2)
		Ships >=150 tons	S74-81 Chap V Reg 12 b
1550	Lights, shapes, sound-signals	Lights, shapes, sound-signals	C72 Part C C72 Part D C72-1 Part C C72-1 Part D
1551	Signaling lamp	Ships >150 tons	S60 Chap V Reg 11 S74 Chap V Reg 11
1560	Charts, ship's	Charts, ship's	S74 Chap V Reg 20
1570	Nautical publications, ship's	Nautical publications, ship's	
1575	Echo sounder	Ships >=500 tons	S74 Chap V Reg 12 d S74-81 Chap V Reg 12 k
1580	Log	Ships >=500 tons; constructed on/after 1 Sep	S74-81 Chap V Reg 12 l 84

Code	Category	Description	Cite
Navigation			
1581	Rudder angle indicator	Ships >=1600 tons Ships >=500 tons; constructed on/after 1 Sep 84	S74-81 Chap V Reg 12 m
1582	Revolution counter	Ships >=1600 tons Ships >=500 tons; constructed on/after 1 Sep 84	
1583	Variable pitch indicator	Ships >=1600 tons Ships >=500 tons; constructed on/after 1 Sep 84	
1585	Rate-of-turn indicator	Ships >=10,000 tons; constructed on/after 1 Sep 84	S74-81 Chap V Reg 12 n
1590	International code of signals	International code of signals	S74 Chap V Reg 21 S74-88 Chap V Reg 21
1599	Other	Other	
	Radio		
1610	Auto alarm	Radiotelephone Radiotelegraph	S74 Chap IV Reg 18 S74 Chap IV Reg 10 h iv S74 Chap IV Reg 16 d,e S74-81 Chap IV Reg 10 h iv S74-88 Chap IV Reg 7 3,4 S60 Chap IV Reg 10 S74 Chap IV Reg 11
1615	Watch receiver 2182 kHz S74-88 Chap IV Reg 12 2,4 S74 Chap IV Reg 10 h iii S74-88 Chap IV Reg 12 4	Watch receiver 2182 kHz	S74 Chap IV Reg 16 g
1620	Main installation	Radiotelegraph - station Radiotelegraph - installation Radiotelegraph - station Radiotelegraph - compulsory Radiotelephone - compulsory Radiotelephone - installation Radiotelephone - station Radiotelephone - compulsory Radiotelephone - installation Radiotelegraph - installation	S60 Chap IV Reg 8 S74-81 Chap IV Reg 10 S74 Chap IV Reg 10 S74 Chap IV Reg 9 S74 Chap IV Reg 3 S60 Chap IV Reg 3 S60 Chap IV Reg 4 S74 Chap IV Reg 16 S60 Chap IV Reg 15 S74 Chap IV Reg 15 S60 Chap IV Reg 14 S74 Chap IV Reg 4 S74-81 Chap IV Reg 16 S60 Chap IV Reg 9

Code	Category	Description	Cite
	Radio		
1621	MF Radio Installation	Equipment - Sea area A4	S74-88 Chap IV Reg 11 1
		Equipment - Sea area A3	S74-88 Chap IV Reg 10 1 2
		Equipment - Sea area A2	S74-88 Chap IV Reg 9 1 1,3.1
		Equipment - Sea area A1	S74-88 Chap IV Reg 8 1 3
		Requirement	S74-88 Chap IV Reg 4
		Installation	S74-88 Chap IV Reg 6
1623	MF/HF Radio installation	Requirement	S74-88 Chap IV Reg 4
		Equipment - Sea are A4	S74-88 Chap IV Reg 11 1
		Equipment - Sea area A3	S74-88 Chap IV Reg 10 2 1
		Installation	S74-88 Chap IV Reg 6
1625	INMARSAT ship earth station	Requirement	S74-88 Chap IV Reg 4
		Installation	S74-88 Chap IV Reg 6
		Equipment - Sea area A1	S74-88 Chap IV Reg 8 1 5.1
		Equipment - Sea area A2	S74-88 Chap IV Reg 9 3 2
		Equipment - Sea area A3	S74-88 Chap IV Reg 10 1 1
			S74-88 Chap IV Reg 10 2 3.2.1
		Equipment - Sea area A4	S74-88 Chap IV Reg 11 1
1630	Reserve Installation	Radiotelegraph	S74 Chap IV Reg 10
			S74-81 Chap IV Reg 10
			S60 Chap IV Reg 9
1635	Maintenance/duplication of equipment	Sea area A1 and A2	S74-88 Chap IV Reg 6
		Sea area A3 and A4	S74-88 Chap IV Reg 7
		General	S74-88 Chap IV R1,2,3,4,5,8
1640	Direction finder	Compulsory	S60 Chap V Reg 12
			S74 Chap V Reg 12 b
		Compuslory	S74-81 Chap V Reg 12 p
		Compulsory	S74-88 Chap V Reg 12 p
		Apparatus	S60 Chap IV Reg 11
			S74 Chap IV Reg 12
1650	VHF	Station	S74 Chap IV Reg 17
			S74-81 Chap IV Reg 17
		Compulsory	S74-81 Chap IV Reg 4-1
			S74-81 Chap V Reg 18
			S74 Chap V Reg 18
1651	VHF radio installation	Installation	S74-88 Chap IV Reg 6
		Equipment - General	S74-88 Chap IV Reg 7 1 1,2
		Equipment - Sea area A1	S74-88 Chap IV Reg 8 1 1
			S74-88 Chap IV Reg 8 2
		Equipment - Sea area A2	S74-88 Chap IV Reg 9 4
		Equipment - Sea area A3	S74-88 Chap IV Reg 10 4
		Equipment - Sea area A4	S74-88 Chap IV Reg 11 2
		Requirement	S74-88 Chap IV Reg 4

Code	Category	Description	Cite
	Radio		
1655	Facilities for reception of marine safety	Equipment - General information Equipment - Sea area A4 Equipment - Sea area A3 Equipment - General Installation Requirement Equipment - Sea area A2	S74-88 Chap IV Reg 7 1 4,5 S74-88 Chap IV Reg 11 1 S74-88 Chap IV Reg 10 2 1,2 S74-88 Chap IV Reg 10 1 1,2 S74-88 Chap IV Reg 7 4 S74-88 Chap IV Reg 6 S74-88 Chap IV Reg 4 1 7 S74-88 Chap IV Reg 9 1 1
1660	Radiotelegraph installation for lifeboats (see also code 0671)	Radiotelegraph installation for lifeboats	S60 Chap IV Reg 12 S74 Chap IV Reg 13 S74-89 Chap IV Reg 13 a
1670	Portable radio installation (see also code 0670)	Portable radio installation (see also code	S74-89 Chap IV Reg 14 a S60 Chap IV Reg 13 S74 Chap IV Reg 14
1671	Satellite EPIRB 406Mhz/1.6Ghz	Equipment - Sea area A2 Equipment - Sea area A4 Equipment - Sea area A3 Equipment - Sea area A1 Equipment - General Installation Requirement Equipment - Sea area A1	S74-88 Chap IV Reg 9 1 3.1,3.3.2 S74-88 Chap IV Reg 11 1 S74-88 Chap IV Reg 10 2 3.1,3.2.2 S74-88 Chap IV Reg 10 1 4.1,4.3 S74-88 Chap IV Reg 8 1 2,5.2 S74-88 Chap IV Reg 7 1 6 S74-88 Chap IV Reg 6 S74-88 Chap IV Reg 4 1 S74-88 Chap IV Reg 8 3
1673	VHF EPIRB	Requirement Installation Equipment - Sea area A1	S74-88 Chap IV Reg 4 1 S74-88 Chap IV Reg 6 S74-88 Chap IV Reg 8 1 1 S74-88 Chap IV Reg 8 3
1675	Radar transponder, ship's Equipment - General) (see also code 0669	Installation S74-88 Chap IV Reg 7 1 3	S74-88 Chap IV Reg 6
1677	Reserve source of energy	Sources Installation	S74-88 Chap IV Reg 13 S74-88 Chap IV Reg 6
1680	Radio log	Radio log	S60 Chap IV Reg 16 S74 Chap IV Reg 19 S74-81 Chap IV Reg 19 S74-88 Chap IV Reg 17
1685	Operation/maintenance	Operation/maintenance	S74-88 Chap IV Reg 15

Code	Category	Description	Cite
	Radio		
1699	Other	EPIRB for survival craft - Apparatus	S74-83 Chap IV Reg 14-1
		2-way radiotelephone appliance for survival craft (see also code 0673)	S74-83 Chap IV Reg 14-3
		Homing device	S74-88 Chap V Reg 12 q S74-81 Chap V Reg 12 q S74 Chap V Reg 12 f
		EPIRB for survival craft - Inspection/maintenance (see also code 0673)	S74-83 Chap IV Reg 14-2
	Marine Pollution (MARPOL) - Annex I		
1705	Shipboard oil pollution emergency plan (SOPEP)	Oil tanker >=150 tons/ Other ship >=400 tons	M73/78 Annex I Reg 26
1710	Oil record book	Part I (Oil tanker >=150 tons/ other ships >=400 tons)	M73/78 Annex I Reg 20
		Part II (Oil tanker >=150 tons)	
1720	Control of discharge of oil	Outside special areas - Machinery spaces (ship >=400 tons)	M73/78 Annex I Reg 9 1 b
		Outside special areas - Cargo/ballast	M73/78 Annex I Reg 9 1 a
		Inside special areas - Machinery spaces (all ships)	M73/78 Annex I Reg 10 2,3
		Inside special areas - Cargo/ballast (Oil tanker)	
1721	Retention of oil on board	Tank for oil residue - sludge (Oil tanker >=150tons; cargo/sloptank)	M73/78 Annex I Reg 15
		Tank for oil residue - sludge (Ship >=400 tons)	M73/78 Annex I Reg 17
1725	Segregation of oil and water ballast	No water ballast in cargo tank not crude oil washed	M73/78 Annex I Reg 13B 2
		No water ballast in fuel tank (New oil tanker >=150 tons and other ship >=4000 tons)	M73/78 Annex I Reg 14 1
		No water ballast in cargo tank (All SBT and CBT tankers)	M73/78 Annex I Reg 13 3
1730	Oily-water separating equipment	Machinery spaces - 100ppm (400<= all ships <10,000 tons)	M73/78 Annex I Reg 16 1
		Machinery spaces - 15ppm (All ships >=10,000 tons)	M73/78 Annex I Reg 16 2
		Fuel/ballast tank (All ships >=400 tons)	M73/78 Annex I Reg 16 1,2
1735	Pumping, piping and discharge	Discharge manifold to shore arrangements on oil tankers	M73/78 Annex I Reg 18 1
		Discharge to sea (all tankers)	M73/78 Annex I Reg 18 2
		Stop sea discharge (new tanker)	M73/78 Annex I Reg 18 3
		Small diameter discharge line (new and existing CBT or COW)	M73/78 Annex I Reg 18 4 b
		Small diameter discharge line (new and existing CBT and COW)	M73/78 Annex I Reg 18 5

Code	Category	Description	Cite
Marine Pollution (MARPOL) - Annex I			
1740	Oil discharge monitoring and control system	Cargo spaces (Oil tanker >=150 tons)	M73/78 Annex I Reg 15 3 a
		Machinery spaces (400 tons <=all ships<10,000 tons; fuel/ballast; alt. to code 1745)	M73/78 Annex I Reg 16 1
		Machinery spaces (all ships >= 10,000 tons; alternative to code 1745)	M73/78 Annex I Reg 16 2
1745	15 PPM Alarm arrangements	Machinery spaces (400 tons<=all ships<10,000 tons; fuel/ballast; alt code for 1740)	M73/78 Annex I Reg 16 7
		Machinery spaces (All ships >=10,000 tons; alternative to code 1740)	
1750	Oil/water interface detector	Oil tanker >=150 tons	M73/78 Annex I Reg 15 3 b
1760	Standard discharge connection	Standard discharge connection	M73/78 Annex I Reg 19
1770	SBT, CBT, COW	Crude oil washing (New tanker >=20,000 DWT)	M73/78 Annex I Reg 13 6
		Special trades (Existing tanker >=40,000 DWT)	M73/78 Annex I Reg 13C
		Special ballast arrangements (Existing tanker >=40,000 DWT)	M73/78 Annex I Reg 13D
		COW Manual	M73/78 Annex I Reg 13B 5
		Crude oil washing (Existing tanker >=40,000 DWT)	M73/78 Annex I Reg 13B
		COW (New tanker >=20,000 DWT)	
		Clean ballast tanks - CBT Manual	M73/78 Annex I Reg 13A 4
		Clean ballast tanks (Existing tanker >=40,000)	M73/78 Annex I Reg 13A
		DWT; resticted time for crude tanker)	M73/78 Annex I Reg 13 10
			M73/78 Annex I Reg 13 9
		Segregated ballast tanks (Existing tanker >=40,000 DWT)	M73/78 Annex I Reg 13 7
		Segregated ballast tanks (New product tanker >=30,000 DWT)	M73/78 Annex I Reg 13 1
		Segregated ballast tanks (New crude tanker >=20,000 DWT)	
		Crude oil washing (Existing tanker >=40,000 DWT)	M73/78 Annex I Reg 13 8
1780	Pollution Report	Pollution Report M73/78 Annex I Reg 10 6	M73/78 Annex I Reg 9 3
1790	Ship type designation	No product oil in crude oil tanker	M73/78 Annex I Reg 1 29
		No Annex I product (oil) in chemical tanker unless designated as oil tanker	M73/78 Annex I Reg 1 4
		No crude oil in product tanker	M73/78 Annex I Reg 1 30
		No Annex I products (oil) =200cbm in non-tankers unless comply with Reg 2.2	M73/78 Annex I Reg 2 2

Code	Category	Description	Cite
Marine Pollution (MARPOL) - Annex I - continued			
1795	Suspected of discharge violation	Suspected of discharge violation	M73/78 Annex I Art 4 R9
1799	Other Other		
	Tankers		
1810	Cargo area segregation	From accommodation, service and control station spaces - Oil	S74-83 Chap II-2 Reg 56 2
		From accommodation, service and control station spaces - Gas (existing)	GEX-3 Chap III No 3 1 1
		From accommodation, service and control station spaces - Gas	IGCC Chap 3 No 3 2 1 IGCC Chap 3 No 3 1 1 GCC-4 Chap III No 3 2 1 GCC-4 Chap III No 3 1 1
		From accommodation, service and control station spaces - Chemical	IBCC Chap 3 No 3 2 1 IBCC Chap 3 No 3 1 1 BCC-10 Chap II No 2 7 1
		From accommodation, service and control station spaces - Oil	S74-89 Chap II-2 Reg 56 2
		From machinery spaces - Chemical	IBCC Chap 3 No 3 1 1
		From machinery spaces - Oil	S74 Chap II-2 Reg 56 a S74-81 Chap II-2 Reg 56 1 S74-83 Chap II-2 Reg 56 1
		From accommodation, service and control station spaces - Chemical	BCC-10 Chap II No 2 6 1
		From machinery spaces - Chemical	
		From accommodation, service and control station spaces - Oil	S74-81 Chap II-2 Reg 56 2
		From machinery spaces - Gas	GCC-4 Chap III No 3 1 1 IGCC Chap 3 No 3 1 1
		From machinery spaces - Gas (existing)	GEX-3 Chap III No 3 1 1
		From accommodation, service and control station spaces - Oil	S74 Chap II-2 Reg 56 b
		From machinery spaces - Oil	S74-89 Chap II-2 Reg 56 1
1815	Air intakes/openings to accommodation, machinery and control station spaces	Chemical	BCC-10 Chap II No 2 7 2,3
		Gas	GCC-4 Chap III No 3 2 IGCC Chap 3 No 3 2
		Chemical	IBCC Chap 3 No 3 2 2,3
		Oil	S74-83 Chap II-2 Reg 56 8 1,2,3 S74 Chap II-2 Reg 56 f S74-81 Chap II-2 Reg 56 6 1,2,3 S74-89 Chap II-2 Reg 56 8 1,2,3
		Gas (existing)	GEX-3 Chap III No 3 2

Code	Category	Description	Cite
	Tankers - continued		
1816	Wheelhouse door, window	Oil	S74-89 Chap II-2 Reg 56 8 2
		Gas (existing)	GEX-3 Chap III No 3 2 2c
		Gas	IGCC Chap 3 No 3 2 4
			GCC-4 Chap III No 3 2 4
		Chemical	BCC-10 Chap II No 2 7 3
		Oil	S74-83 Chap II-2 Reg 56 8 2
			S74-81 Chap II-2 Reg 56 6 2
			S74 Chap II-2 Reg 56 f ii
		Chemical	IBCC Chap 3 No 3 2 3
1820	Cargo pumproom/handling spaces	Ventilation system and air changes - Chemical	BCC-10 Chap III No 3 1
		Ventilation system and air changes - Gas	IGCC Chap 12 No 12 1
			GCC-4 Chap XII No 12 1
		Ventilation system and air changes - Gas (existing)	GEX-3 Chap XII No 12 1
		Ventilation system and air changes - chemical (special requirements)	IBCC Chap 15 No 15 17,18
		Ventilation system and air changes - Chemical	IBCC Chap 12 No 12 1,2
		Ventilation system and air changes - Oil	S74-81 Chap II-2 Reg 59 3 1
			S74 Chap II-2 Reg 58 c
		Ventilation system and air changes - Chemical (special requirements)	BCC-10 Chap IV No 4 13
1825	Spaces in cargo area	Access - Gas	IGCC Chap 3 No 3 5
		Ventilation - Oil	S74 Chap II-2 Reg 58 a
		Electrical requirements - Gas	IGCC Chap 10 No 10
		Electrical requirements - Gas (existing)	GEX-3 Chap X No 10
		Electrical requirements - Gas	GCC-4 Chap X No 10
		Electrical requirements - Chemical (special requirements)	IBCC Chap 17 Column i,i'',i'''
			BCC-10 Chap VI Column i
		Electrical requirements - Chemical	IBCC Chap 10 No 10 2,3
			BCC-10 Chap III No 3 3,4,5,6,7
		Electrical requirements - Oil	S74-81 Chap II-1 Reg 45 10
		Access - Gas (existing)	GEX-3 Chap III No 3 5
		Ventilation - Oil	S74-81 Chap II-2 Reg 59 1,2
		Chemical	IBCC Chap 3 No 3 4
		Access - Chemical	BCC-10 Chap II No 2 9
		Access - Oil	ILO134 Art 4 3 a,d
		Ventilation - Gas (existing)	GEX-3 Chap XII No 12 1
		Ventilation - Gas	IGCC Chap 12 No 12 1
			GCC-4 Chap XII No 12 1
		Ventilation - Chemical	IBCC Chap 12 No 12 1,2
			BCC-10 Chap III No 3 1
		Ventilation - Oil	S74-89 Chap II-2 Reg 59 2
		Access - Gas	GCC-4 Chap III No 3 5
1830	Cargo transfer	Control/method - Gas	GCC-4 Chap V No 5 5
		Control/method - Gas (existing)	GEX-3 Chap V No 5 5
		Piping - Oil	ILO134 Art 4 3 e
		Piping - Chemical	BCC-10 Chap II No 2 10
			IBCC Chap 5 No 5 5
		Piping - Gas	GCC-4 Chap V No 5 2
		Piping - Gas (existing)	GEX-3 Chap V No 5 2
		Control/method - Chemical	IBCC Chap 5 No 5 6
		Piping - Gas	IGCC Chap 5 No 5 2
		Control/method - Oil	ILO134 Art 4 3 e
		Cargo hoses - Gas (existing)	GEX-3 Chap V No 5 4

Code	Category	Description	Cite
	Tankers – continued		
1830	Cargo transfer	Cargo hoses - Gas	IGCC Chap 5 No 5 7 GCC-4 Chap V No 5 4
		Cargo hoses - Chemical	IBCC Chap 5 No 5 7 BCC-10 Chap II No 2 12
		Cargo hoses - Oil	ILO134 Art 4 3 e
		Control/method - Chemical	BCC-10 Chap II No 2 11
		Control/method	IGCC Chap 5 No 5 8
1835	Cargo vent system	Oil	S74 Chap II-2 Reg 58 a
		Gas (existing)	GEX-3 Chap VIII No 8
		Gas	IGCC Chap 8 No 8 GCC-4 Chap VIII No 8
		Chemical	IBCC Chap 8 No 8 1,2,3 BCC-10 Chap II No 2 13,14
		Oil	S74-81 Chap II-2 Reg 59 1,2 S74-89 Chap II-2 Reg 59 2
1836	Temperature control	Chemical (special requirements)	BCC-10 Chap IV No 4 18
		Gas	IGCC Chap 7 No 7
		Gas (existing)	GEX-3 Chap VII No 7
		Gas	GCC-4 Chap VII No 7
		Chemical	BCC-10 Chap II No 2 15
		Chemical (special requirements)	IBCC Chap 15 No 15 13
		Chemical	IBCC Chap 7 No 7 1
1840	Instrumentation	Oxygen meter - Oil	S74 Chap II-2 Reg 62 m
		Pressure gauges - Chemical (special requirements)	IBCC Chap 15 No 15 14 5
		Pressure gauges - Gas	GCC-4 Chap XIII No 13 4 IGCC Chap 13 No 13 5
		Pressure gauges - Gas (existing)	GEX-3 Chap XIII No 13 4
		Gas/vapor detection - Chemical	BCC-10 Chap III No 3 11 IBCC Chap 13 No 13 2
		Gas/vapor detection - Gas	GCC-4 Chap XIII No 13 6
		Pressure gauges - Chemical (special requirements)	BCC-10 Chap IV No 4 11 3
		Gas/vapor detection - Gas (existing)	GEX-3 Chap XIII No 13 6
		Oxygen meter - Chemical	IBCC Chap 9 No 9 1 3.4
		Oxygen meter - Oil	S74-81 Chap II-2 Reg 62 17
		Oxygen meter - Chemical	BCC-10 Chap II No 2 19 3d
		Oxygen meter - Gas	GCC-4 Chap XIII No 13 6 14
		Oxygen meter - Gas (existing)	GEX-3 Chap XIII No 13 6 13
		Gas/vapor detection - Gas	IGCC Chap 13 No 13 6
		Level indicator/alarm - Gas (level indicator)	GCC-4 Chap XIII No 13 2
		Temperature indicator - Gas (existing)	GEX-3 Chap XIII No 13 5
		Oxygen meter - Gas	IGCC Chap 13 No 13 6 14
		Level indicator/alarm - Chemical (high level; special requirement)	BCC-10 Chap IV No 4 14 1
		Level indicator/alarm - Chemical (special requirement)	BCC-10 Chap VI Column h
		Level indicator/alarm - Chemical (gauging)	BCC-10 Chap III No 3 9 IBCC Chap 13 No 13 1
		Level indicator/alarm - Chemical (special requirement)	IBCC Chap 17 Column h
		Level indicator/alarm - Gas (high liquid level alarm)	GCC-4 Chap XIII No 13 3

Code	Category	Description	Cite
	Tankers – continued		
1840	Instrumentation	Level indicator/alarm - Gas (level indicator)	IGCC Chap 13 No 13 2
		Level indicator/alarm - Gas (high liquid level alarm)	IGCC Chap 13 No 13 3
		Level indicator/alarm - Gas (existing; level indicator)	GEX-3 Chap XIII No 13 2
		Level indicator/alarm - Gas (existing; high liquid level alarm)	GEX-3 Chap XIII No 13 3
		Temperature indicator - Chemical	BCC-10 Chap II No 2 15 5 IBCC Chap 7 No 7 1 5
		Temperature indicator - Gas	GCC-4 Chap XIII No 13 5 IGCC Chap 13 No 13 5
		Level indicator/alarm - Chemical (high level; special requirement)	IBCC Chap 15 No 15 19 6
1850	Fire protection - cargo deck area	Gas (drypowder)	GCC-4 Chap XI No 11 4
		Gas (waterspray)	GCC-4 Chap XI No 11 3
		Gas(existing; waterspray)	GEX-3 Chap XI No 11 4
		Gas (waterspray)	IGCC Chap 11 No 11 3
		Gas (existing; drypowder)	GEX-3 Chap XI No 11 4
		Chemical	BCC-10 Chap III No 3 14
		Oil (foam)	S74-81 Chap II-2 Reg 60,61 S74P78 Chap II-2 Reg 60 S74 Chap II-2 Reg 60,61
		Gas (drypowder)	IGCC Chap 11 No 11 4
		Chemical	IBCC Chap 11 No 11 3
1860	Personal protection	Medical first aid, oxygen, resuscitation, antidotes - Gas	GCC-4 Chap XIV No 14 9
		Medical first aid, oxygen, resuscitation, antidotes - Chemical	IBCC Chap 14 No 14 2 9 BCC-10 Chap III No 3 16 11
		Stretcher - Gas (existing)	GEX-3 Chap XIV No 14 8
		Medical first aid, oxygen, resuscitation, antidotes - Gas	IGCC Chap 14 No 14 3 2
		Stretcher - Gas	GCC-4 Chap XIV No 14 8
		Decontamination shower, eyewash - Gas	IGCC Chap 14 No 14 4 3
		Stretcher - Chemical	IBCC Chap 14 No 14 2 7 BCC-10 Chap III No 3 16 9
		Stretcher - Gas	IGCC Chap 14 No 14 3 1
		Medical first aid, oxygen, resuscitation, antidotes - Gas (existing)	GEX-3 Chap XIV No 14 9
		Decontamination shower, eyewash - Chemical Gas (special requirement)	BCC-10 Chap III No 3 16 12 GCC-4 Chap XVII No 17 2 2
		Decontamination shower, eyewash - Gas (existing; special requirement)	GEX-3 Chap XVII No 17 2 2
		Respiratory protection - Chemical	BCC-10 Chap III No 3 16 10 IBCC Chap 14 No 14 2 8
		Respiratory protection - Gas (special requirement)	GCC-4 Chap XVII No 17 2 1
		Respiratory protection - Gas	IGCC Chap 14 No 14 4 2
		Respiratory protection - Gas (existing; special requirement)	GEX-3 Chap XVII No 17 2 1
		Air supplies - Gas (existing)	GEX-3 Chap XIV No 14 5
		Decontamination shower, eyewash - Chemical	IBCC Chap 14 No 14 2 10
		Safety equipment - Gas	GCC-4 Chap XIV No 14 3,4
		Protective equipment - Chemical	BCC-10 Chap III No 3 16 1,2
		Protective equipment - Gas	GCC-4 Chap XIV No 14 1 IGCC Chap 14 No 14 1

Code	Category	Description	Cite
	Tankers		
1860	Personal protection	Protective equipment - Gas (existing)	GEX-3 Chap XIV No 14 1,2
		Protective equipment - Chemical	IBCC Chap 14 No 14 1 1,2
		Safety equipment - Chemical	IBCC Chap 14 No 14 2 1,2,5
		Air supplies - Gas	IGCC Chap 14 No 14 2 3
		Safety equipment - Gas	IGCC Chap 14 No 14 2 1,2
		Safety equipment - Gas (existing)	GEX-3 Chap XIV No 14 3,4
		Air supplies - Chemical	IBCC Chap 14 No 14 2 3
		Safety equipment - Chemical	BCC-10 Chap III No 3 16 4,5
		Air supplies - Gas	GCC-4 Chap XIV No 14 5
		Safety equipment (additional) - Gas (special requirement)	GCC-4 Chap XVII No 17 2 3
		Air supplies - Chemical	BCC-10 Chap III No 3 16 6
		Fireman's outfit (additional) - Gas (existing)	GEX-3 Chap XI No 11 6
		Fireman's outfit (additional) - Gas	IGCC Chap 11 No 11 6 GCC-4 Chap XI No 11 6
		Fireman's outfit (additional) - Oil/chemical/gas	S74-81 Chap II-2 Reg 17 31,2 S74 Chap II-2 Reg 52 j i
		Safety equipment (additional) - Gas (existing; special requirement)	GEX-3 Chap XVII No 17 2 3
1870	Special requirements	Chemical	BCC-10 Chap IV IBCC Chap 15
		Gas	GCC-4 Chap XVII IGCC Chap 17
		Gas (existing)	GEX-3 Chap XVII
1880	Cargo information		GEX-3 Chap XVIII No 18 1,2,5
		Gas	IGCC Chap 18 No 18 1,2,5
		Chemical	IBCC Chap 16 No 16 2 BCC-10 Chap V No 5 2
		Gas	GCC-4 Chap XVIII No 18 1,2,5
1885	Tank entry	Oil	ILO134 Art 4 3 a
		Chemical	BCC-10 Chap V No 5 4 IBCC Chap 16 No 16 4 2,3
		Gas	GCC-4 Chap XVIII No 18 4 IGCC Chap 18 No 18 4 1,2
		Gas (existing)	GEX-3 Chap XVIII No 18 4
1899	Other	SBT, CBT, Cow - See code 1770	
		Requirements for ships engaged in the incineration at sea of liquid chemical waste	IBCC Chap 19

Code	Category	Description	Cite
	Marine Pollution (MARPOL) - Annex II		
1910	Cargo record book	Cargo record book	M73/78 Annex II Reg 9
1911	P & A manual	P & A manual	M73/78 Annex II ST Chap 2
1920	Efficient stripping	New ships (on or after 1 Jul 86) Existing ships Efficient stripping	M73/78 Annex II ST C5.2,6.2 M73/78 Annex II ST C10.2,11.2 M73/78 Annex II Reg 5A
1925	Residue discharge systems	New ships (on or after 1 Jul 86) Existing ships	M73/78 Annex II ST Chap 3 M73/78 Annex II ST Chap 8
1930	Tankwashing equipment	Tankwashing equipment	M73/78 Annex II ST App B
1940	Prohibited discharge of NLS slops	Prohibted discharge of NLS slops New ships (on or after 1 Jul 86)	M73/78 Annex II Reg 5 M73/78 Annex II Reg 8 9 M73/78 Annex II ST C10.5,11.5 M73/78 Annex II ST C5.5,6.5
1960	Cargo heating systems - Category B	Existing ships substances 1 Jul 86)	M73/78 Annex II ST C8.2 M73/78 Annex II ST Chap 3.2
1970	Ventilation procedures/equipment	Ventilation procedures/equipment	M73/78 Annex II ST App C
1980	Pollution Report	MEPC Resolution 26(23)	
1990	Ship type designation	Ship type designation	M73/78 Annex II Reg 13
1999	Other	Other	

Code	Category	Description	Cite
SOLAS Related Operational Deficiencies			
2010	Muster list	Muster list	S74 Chap XI Reg 4
2015	Communication	Communication	
2020	Fire drills	Fire drills	
2025	Abandon ship drills	Abandon ship drills	
2030	Damage control plan	Damage control plan	
2035	Fire control plan	Fire control plan	
2040	Bridge operation	Bridge operation	
2045	Cargo operation	Cargo operation	
2050	Operation of machinery	Operation of machinery	
2055	Manuals, instructions, etc.	Manuals, instructions, etc.	
2060	Dangerous goods or harmful substances in packaged form	Dangerous goods or harmful substances in packaged form	
2099	Other	Other	

Code	Category	Description	Cite
	MARPOL Related Operational Deficiencies		
2110	Oil and oily mixtures from machinery		Res.A.787(19) Chap 3 5 11
2115	Loading, unloading and cleaning	Loading, unloading and cleaning procedures for cargo spaces of tankers	Res.A.787(19) Chap 3 5 14
2120	Garbage	Garbage	
	2199 Other	Other	
Marine Pollution (MARPOL) - Annex III			
	2210 Packaging	Packaging	M73/78 Annex III Reg 2
2220	Marking and labeling	Marking and labeling	M73/78 Annex III Reg 3
	2230 Documentation	Documentation	M73/78 Annex III Reg 4
	2240 Stowage	Stowage	M73/78 Annex III Reg 5
	2299 Other	Other	
	ISM Related Deficiencies		
2501	Safety and environmental policy	Establishment of policy, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 2.1
2502	Establishment of policy, major non-conformity		
2503	Company responsibility and authority	Responsibility, authority and interrelation defined and document in SMS, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 3.2
2504		Responsibility, authority and interrelation defined and document in SMS, major non-conformity	
2505	Designated person(s)	Designated person, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 4
2506	Designated person, major non-conformity		

Code	Category	Description	Cite
	ISM Related Deficiencies - continued		
2507	Master's responsibility and authority	Master's responsibility defined and documented in SMS, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 5.1
		Master's authority documented in SMS, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 5.2
2508	Master's authority	documented in SMS, major non-conformity	
		Master's responsibility defined and documented in SMS, major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 5.1
2510	Safety and environmental policy	Implementation and maintenance of policy, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 2.2
		Implementation and maintenance of policy, major non-conformity	
2515	Company responsibility and authority	Adequate resources and shore-based support provide, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 3.3
		Adequate resources and shore-based support provide, major non-conformity	
2530	Resources and personnel	Adequate understanding by personnel involved in SMS, major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 6.4
		Effective communication in execution of SMS-related duties, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 6.7
		Relevant information in working language(s), major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 6.6
		Relevant information in working language(s), non-conformity	
		Procedures for identification of and providing training, major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 6.5
		Procedures for identification of and providing training, non-conformity	
		Procedures for new or newly assigned personnel, major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 6.3
		Procedures for new or newly assigned personnel, non-conformity	
		Manning requirements, major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 6.2
		Manning requirements, non-conformity	
		Requirements regarding Master, major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 6.1
		Requirements regarding Master, non-conformity Adequate understanding by personnel involved in SMS, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 6.4
		Effective communication in execution of SMS related duties, major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 6.7

APPENDIX B: INDEX OF OFFICIAL POLICY LETTERS AND GUIDANCE

Official Policy Letters and Guidance

Indexes of Active Policy Letters and Other Official Guidance

Many offices within CG Headquarters issue policy guidance and directives of either a temporary nature, or in advance of publication in the Marine Safety Manual (e.g., G-MOC issues MOC Policy Letters and the MSC issues Technical Notes). It is recommended that the index of those active documents are maintained in this section, following this cover page. For example, the 0-Series MOC Policy Letter Index would be kept in this appendix.

Code	Category	Description	Cite
	ISM Related Deficiencies - continued		
2535	Development of plans for shipboard operations	Development of plans for shipboard operations, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 7
		Development of plans for shipboard operations, major non-conformity	
2540	Emergency preparedness	Measures ensuring organizational response, major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 8.3
		Procedures for potential emergency shipboard situations, major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 8.1
		Programs for drills and exercises, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 8.2
		Programs for drills and exercises, major non-conformity	
		Measures ensuring organizational, response non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 8.3
		Procedures for potential emergency shipboard situations, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 8.1
2545	Reports/analysis of non-conformities, etc.	Implementation of corrective action, major non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 9.2
		Implementation of corrective action, non-conformity	
		Procedures for reporting, investigation and analysis, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 9.1
2550	Maintenance of ship and equipment	Maintenance of ship and equipment, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 10
		Maintenance of ship and equipment, major non-conformity	
2555	Documentation	Documentation, non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 11
		Documentation, major non- conformity	
2560	Company verification, review and evaluation,	Company verification, review and evaluation non-conformity	S74-94 Chap IX Reg 3,5 ISM Code, Section 12
		Company verification, review and evaluation, major non-conformity	
2565	Certification, verification and control	Safety Management Certificate, major non-conformity	S74-94 Chap IX Reg 4 3
		Ship operated by company holding a DOC, non-conformity	S74-94 Chap IX Reg 3 2
		Ship operated by company holding a DOC, major non-conformity	S74-94 Chap IX Reg 3 2
		Copy of DOC on board, non-conformity	S74-94 Chap IX Reg 4 2
		Copy of DOC on board, major non-conformity	
		Safety Management Certificate, non-conformity	S74-94 Chap IX Reg 4 3

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Navigation and Inspection Circulars (NVICs)

Indexes of Active NVICs

Navigation and Inspection Circulars (NVICs) provide valuable information to the marine safety constituency—Coast Guard, industry and the public. It is recommended that the index of those active documents are maintained in this section, following this cover page. For example, the 0-Series NVIC Index would be kept in this appendix.

APPENDIX D: LOCATION OF FORMS

Form	Stock Number	Date	Stock Point
CG-2692		06-87	Filler
CG-2752A		03-67	Filler
CG-2832	7530-00-F01-2030	04-69	ELC Balt
CG-2832A		11-88	MSC
CG-2936		11-69	Filler
CG-3308A		10-84	Filler
CG-3347		06-93	Filler
CG-3347A	7530-01-GF2-9790	02-81	ELC Balt
CG-3347B		06-93	Filler
CG-3752		03-97	Filler
CG-4100	7530-01-GF2-5080	01-91	ELC Balt
CG-4200		07-69	ELC Balt
CG-4355		06-83	Filler
CG-4359		06-93	Filler
CG-4504		12-67	Filler
CG-4602A	7530-01-GF3-0660	07-93	ELC Balt
CG-4602B		01-87	G-MEP
CG-5148	7530-01-GF2-8660	06-78	ELC Balt
CG-5148A		02-87	G-MOC
CG-5148B		02-87	G-MOC
CG-5334		08-82	G-MOC
CG-5352		06-93	Filler
CG-5401		08-92	Filler
CG-5432		06-88	G-MOC
CG-835	7530-00-F01-0250	03-68	SCB
CG-836		03-67	G-MOC
CG-840	BOOKLETS, NO LONGER FORMS		G-MOC
CG-841	7530-00-F01-0370	03-85	ELC Balt
CG-854		04-97	Filler
CG-948		04-97	Filler
CG-949		04-97	Filler
CG-967		06-93	Filler
CG-969A		03-67	Filler
CGHQ - 10030		01-86	G-MOC

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