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NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 01-06

Subj: GUIDELINES FOR ASSESSMENT OF MERCHANT MARINERS' PROFICIENCY FOR CERTIFICATION AS RATINGS FORMING PART OF AN ENGINEERING WATCH THROUGH DEMONSTRATIONS OF SKILLS

Ref: (a) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW), Regulation III/4 and Section A-III/4 of STCW Code, incorporated into regulations at 46 CFR 12.01-3
(b) Federal Register dated March 2, 2001, Docket No. USCG-2001-8920-1, Guidelines for Assessing Merchant Mariners' Proficiency Through Demonstrations of Skills for Ratings Forming Part of an Engineering Watch
(c) Guidelines for Assessing Merchant Mariners' Proficiency Through Demonstrations of Skills for Ratings Forming Part of an Engineering Watch, Docket No. USCG-2001-8920-2, available at: http://dms.dot.gov

1. PURPOSE. This Circular provides the national guidelines for the assessment of merchant mariners' proficiency through demonstrations of skills for STCW certification as ratings forming part of an engineering watch (RFPEW). These guidelines are for use in training programs approved or accepted by the U. S. Coast Guard as meeting reference (a) and by designated examiners (DEs) when carrying out their assessments unless alternatives are used as discussed in paragraph 5.d.

2. ACTION. Officers in Charge, Marine Inspection (OCMIs), should use this Circular when establishing that candidates are entitled to hold STCW certificates as RFPEW as stipulated in 46 CFR 12.15-3(e). OCMIs should also bring this Circular to the attention of the appropriate professionals in the maritime industry within their zones. This Circular is available on the

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World Wide Web at **http://www.uscg.mil/hq/g-m/nvic/**. Within the Coast Guard, it will be distributed by electronic means only.

3. DIRECTIVES AFFECTED. This NVIC cancels the checklist and assessment control sheets of enclosure (2) to National Maritime Center (NMC) Policy Letter 14-02, *Qualifications for Deck and Engineering Ratings*. In lieu of the checklist and assessment control sheets in the policy letter, applicants should use the checklist and assessment control sheets enclosed in this NVIC. However, applicants for a rating as RFPEW who began their sea service or training six months before the date this NVIC was published may continue to use the checklist and assessment control sheets from the policy letter, provided that application for the STCW rating as RFPEW is made not later than six months after the publication date of this NVIC.

4. BACKGROUND.

   a. The guidance from the International Maritime Organization (IMO) on shipboard assessments of proficiency, MSC/Circular 853, suggests that administrations should develop standards and measures of performance for practical tests as part of a program of training and assessment of mariners. These standards and measures ensure the uniform assessment of mariners without regard to individuality of the DEs and will result in standardization, fairness, and consistency. Enclosure (1) provides an overview of the Coast Guard's policy on assessments of mariners as required by the STCW.

   b. The Coast Guard tasked the Merchant Marine Personnel Advisory Committee (MERPAC) to recommend national criteria for mariners' certification as RFPEW. The NMC then used MERPAC's recommendations to develop proposed national guidelines, which we published for public comment in references (b) and (c). Comments from the public occupy attachments (3) through (9) of reference (c). MERPAC's recommended guidelines included "knowledge" competencies not included within these national guidelines. These guidelines focus solely on the practical demonstrations of mariners' competency. Out of this process came the final version of the national assessment guidelines contained in enclosure (2).

5. DISCUSSION.

   a. Each mariner who commences training or sea service required by the STCW on or after August 1, 1998, or applies for STCW certification as RFPEW on or after February 1, 2002, must, under 46 CFR 12.02-7(e), hold documentation demonstrating competence in those skills specified in the table of enclosure (2). Unless a mariner demonstrates proficiency in the skills required for competence of a RFPEW in enclosure (2), the OCMI will not issue the STCW certification as stipulated in 46 CFR 12.15-3(e).

   b. STCW Regulation III/4, paragraph 3, states that this training shall be associated with engine-room watchkeeping. Many U.S.-flag vessels use automated engine rooms, where non-licensed engine-department personnel work as day-workers. It is the Coast Guard's interpretation that service, training, and experience gained by engine-department day-workers on vessels with automated engine-rooms will be acceptable towards meeting the

minimum proficiency for certification as ratings forming part of an engine-room watch when they have demonstrated their ability to perform the individual functions associated with watchstanding duties as detailed in enclosure (2).

c. Qualified persons assessing mariners for STCW certification as RFPEW should use either the guidelines in enclosure (2) or an alternative as discussed in paragraph 5.d when assessing practical demonstrations of proficiency.

d. Those who assess the proficiency of mariners may refine these published guidelines and develop innovative alternatives; however, they must submit any deviations from these guidelines to the NMC for approval by the Coast Guard before use. A training institution submitting a course that leads to certification as RFPEW must either state that the guidelines in enclosure (2) will apply or otherwise identify the guidelines it will use.

e. Merchant mariners required to demonstrate proficiency through demonstrations of skills for RFPEW should use these guidelines for self-study and self-assessment.

6. DISCLAIMER. While the guidance contained in this document may assist the industry, the public, the Coast Guard, and other Federal and State regulators in applying statutory and regulatory requirements, the guidance is not a substitute for applicable legal requirements; nor is it itself a rule. Thus, it is not intended to nor does it impose legally-binding requirements on any party, including the Coast Guard, other Federal agencies, the States, or the regulated community.

7. FORMS AVAILABILITY. N/A

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Encl: (1) Assessment of Mariners
(2) Assessment Guidelines for Table A-III/4 of the STCW Code (RFPEW)
(3) Practical Demonstration Assessment Guidance and Sample Assessment Control Sheets (RFPEW)
(4) Summary of Assessment Standards (RFPEW)
(5) Control Sheets for Specification of Minimum Standard of Competence (RFPEW)

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B:a G-P(1); G-PS(1); G-PSO (4)
D:l CG Liaison Officer MILSEALIFTCOMD (Code N-7CG) (1)

ASSESSMENT OF MARINERS

1. ASSESSMENT OF SKILLS.

   a. Traditionally, in the United States, the Coast Guard has measured mariners' competency through assessments of knowledge. Knowledge-based components of this competency usually involve the recalling of facts or concepts, and written examinations are normally valid and reliable instruments for assessing such components. Historically, the Coast Guard has issued licenses and documents based predominantly on written essay and multiple-choice examinations. Currently, the Coast Guard employs a bank of over 25,000 multiple-choice questions to examine mariners.

   b. Assessment of understanding is more complex than assessment of knowledge. Understanding involves specific principles and information processes necessary to analyze alternatives, make conclusions, make choices and decisions, or affect outcomes. Because it is a covert characteristic, understanding must be ascertained through assessment of an overt behavior that demonstrates understanding. Ascertainment can employ a variety of mechanisms, ranging from written problems involving calculations or analysis of facts to practical demonstrations requiring diagnostic or analytical reasoning. Many of the Coast Guard's 25,000 written questions for multiple-choice examinations involve problems that assess an understanding; but, in many instances, complete understanding is best measured through actual assessment of a mariner's performance.

   c. Guidance provided by the IMO on certain assessments of proficiency requires development of standards and measures of performance for practical tests as part of seafarers' training programs. This is a new requirement for many flag-state administrations and their maritime industries. Performance assessment is part of a larger, well-established body of knowledge called instructional system design (ISD). Within this body, assessment methodologies range from the simple and straightforward to the complex and difficult. For the purposes of STCW, the Coast Guard believes the simplest and most straightforward approach works best and has decided to develop a set of national guidelines. In these, a performance standard has three components: the conditions, the behavior, and the criteria. The first establishes the conditions under which the candidate demonstrates the knowledge, understanding, or proficiency. The second specifies the precise set of knowledge, understandings, or skills (the 'behaviors') that is recalled, demonstrated, or performed. The third are the particular standards against which we measure an applicant's behavior to determine whether the performance is minimally competent.

   d. The third component is normally expressed in terms of "measures" or combinations of "measures," such as a time limit or requirement, a specific sequence, a number or a percentage, a tolerance, or a degree of

conformance or accuracy required. For highly critical skills, the criteria may require precise answers, require exact sequences of actions, or have very small tolerances of errors or degrees of conformance. For instance, missing just one step of a sequence may constitute failure because that step was critical to achieving the final outcome. In less-critical skills, wider tolerances or degrees of conformance may pass; however, in every case the applicant must demonstrate the minimal level of competence set forth in the criteria.

2. DEVELOPMENT OF STANDARDS.

a. While the STCW Code gives broad guidance on the standards of performance and methods of assessment, the responsibility for the development of specific performance standards for each competency lies with the training provider. Development of valid and reliable performance standards is a resource-intensive effort. To minimize cost to the industry, promote uniformity, expedite the development process, and provide valid examples of these new performance standards, the Coast Guard asked that the Merchant Marine Personnel Advisory Committee (MERPAC) develop recommendations for a set of these standards.

b. MERPAC developed the core elements of a set of these standards and forwarded them to the Coast Guard. We reviewed the initial recommendations and compared them to the requirements of the STCW Code. We incorporated the final products into the proposed national assessment guidelines and published them in the Federal Register for public comments. After considering the comments, we have made them the standards for identifying minimum levels of competence during demonstrations of a mariner's proficiency.

c. We encourage companies and maritime-training institutions to use the national guidelines for assessment of STCW proficiencies in training programs submitted for our approval or for acceptance by a recognized quality-standards system. We recommend that they use them during STCW proficiency assessments conducted by their designated examiners (DEs). They may develop alternative assessment standards; however, they may not use these in accepted or approved training programs until the National Maritime Center of the Coast Guard has reviewed and approved them pursuant to 46 CFR 10.303(e).

3. WRITTEN EXAMINATIONS.

a. Written examinations used in training programs under the STCW Convention deserve particular emphasis. Companies and maritime training institutions are encouraged to review their written instruments for assessing each knowledge-based and understanding-based competency

from the STCW Code to ensure they include at least one question for each competency in the appropriate table from Part A of the Code.

b. We recommend that companies and maritime training institutions should also have multiple questions for addressing each knowledge-based and understanding-based competency from the STCW to afford candidates a fair opportunity to demonstrate minimum ability. If only one question assessed a required knowledge or understanding, an incorrect answer would constitute a failure to have demonstrated the knowledge or understanding and would leave the candidate ineligible to have that competency certified by the DE, unless the DE used an alternative method. Accordingly, it would be preferable for the assessment to contain several questions. For example, in a written multiple-choice examination, if four questions concerned the same critical knowledge and if the performance standard were a score of 70%, three correct answers and one incorrect answer would meet the requirements for minimum competency. In this case the mariner would qualify as competent for that knowledge.

Assessment Guidelines for TABLE A-III/4
Proficiency in Ratings Forming Part of an Engineering Watch

Candidates for certificates as Ratings Forming Part of an Engineering Watch must meet the standards of competence set out in STCW Code Table A-III/4 (46 CFR 12.15-3(e)). In order to accomplish this, candidates must successfully accomplish practical demonstrations of skill for selected competencies.

Practical Demonstrations of Skills

The assessment criteria that follow identify those skills in Table A-III/4 *that are demonstrated*:

1. Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch;
2. Understand orders and be understood in matters relevant to watchkeeping duties;
3. For keeping a boiler watch; Maintain the correct water levels and steam pressures; and
4. Operate machinery equipment and apply emergency procedures.

These assessment guidelines establish the conditions under which the assessment will occur, the performance or behavior the candidate is to accomplish, and the standards against which the examiner measures the performance. The examiner can use a checklist in conducting assessments of practical demonstrations of skill. Checklists allow a training institution or designated examiner to ensure that critical tasks are not overlooked when evaluating a candidate's practical demonstration. Training institutions and designated examiners can develop their own checklists for use in conducting the assessments in a complete and structured manner.

This NVIC cancels the checklist and assessment control sheets of enclosure (2) to National Maritime Center (NMC) Policy Letter 14-02, Qualifications for Deck and Engineering Ratings. In lieu of the checklist and assessment control sheets in the policy letter, applicants should use the checklist and assessment control sheets enclosed in this NVIC. However, applicants for a rating as RFPEW who began their sea service or training six months before the date this NVIC was published may continue to use the checklist and assessment control sheets from the policy letter, provided that application for the STCW rating as RFPEW is made not later than six months after the publication date of this NVIC.

Function: Marine engineering at the support level

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch. Understand orders and be understood in matters relevant to watchkeeping duties.	*Engine-room watchkeeping procedures**	Aboard a vessel, in port or underway, or in an approved simulator or laboratory, given proper equipment,	the candidate will properly relieve the watch.	The candidate: 1. reports for duty 15 minutes before the hour; 2. determines from the off-going watch: (a) operational status of the plant; (b) unusual alarms or conditions occurring during the previous watch; (c) standing orders; (d) maintenance performed during the previous watch; (e) on-going repairs affecting plant operations; and (f) outstanding safety conditions; and 3. seeks clarification from the off-going watch or engineer if information was not clearly understood.
		Aboard a vessel, in port or underway, or in an approved simulator or laboratory, given proper equipment,	the candidate will properly hand over the watch.	The candidate: 1. in preparation for relief, ensures that all assigned routine duties are completed before the conclusion of the watch; 2. communicates to the oncoming watch: (a) operational status of the plant; (b) unusual alarms or conditions occurring during previous watch; (c) standing orders; (d) maintenance performed during previous watch; (e) on-going repairs affecting plant operations; and

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) (f) outstanding safety conditions; and 3. ensures that the watch relief is fully aware of the operational status of the plant.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will properly make a round during watch.	The candidate: 1. inspects, monitors, and checks system parameters of all auxiliary systems and machinery, and main propulsion machinery, checks operating procedures, temperatures, flow and level indicators, and collects readings for log book entry; 2. inspects bilges and pump as necessary; notes piping condition in bilges and conducts visual inspection of sea chests; 3. checks machinery spaces for all signs of fire, flooding, loss of lighting, and electric shock hazard; 4. wipes up all spilled oil; 5. inspects all system and machinery piping for signs of leaks; 6. monitors all applicable strainer and filter pressure drops; 7. checks electric motors and machinery for overheating; 8. investigates any abnormal sounds, vibrations, or odors, as well as loose fittings, nuts, bolts, flanges, clamps, hangers, and connections; 9. checks for any gear adrift or machinery guards not in place; 10. notifies watch engineer of any unusual or unsafe

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) conditions; 11. takes appropriate action to correct any unusual or unsafe conditions; 12. demonstrates proper keeping of the bell book; and 13. ensures that no safety violations have occurred.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will adjust the water-level range setting and the pressure-range setting for the potable-water tank.	The candidate: 1. correctly adjusts water-level range and pressure setting within +/- 5% of proper operating conditions for potable-water tanks; and 2. ensures that no safety violations have occurred.
		Aboard a vessel, in port or in a laboratory, given proper equipment,	the candidate will take on fresh water.	The candidate: 1. determines from the watch engineer, or equivalent, the order in which to fill the fresh-water tanks; 2. lines up the system properly; 3. ensures that proper hose is used; 4. flushes out dock connection; 5. assists taking sample for testing before taking on water; 6. properly takes on fresh water; and 7. secures the fresh-water valves after task is complete.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will monitor the sewage-treatment plants.	The candidate: 1. checks the plant's operational status; 2. checks the destination of "black water" sewage; 3. checks sewage-circulating and overboard-discharge pump pressures; 4. checks sewage-circulating and overboard-discharge pump mechanical seals for leakage;

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 5. checks air-compressor discharge pressure; 6. checks the chemical-batch tank level; 7. checks for any unusual conditions or noises; 8. notifies the watch engineer of any unusual or unsafe conditions; and 9. ensures that no safety or pollution violations have occurred.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will monitor the oily-water separators.	The candidate: 1. checks plant's operational status; 2. checks bilge-water tank level; 3. checks oily-water-separator chamber pressure or vacuum; 4. checks filling related pressure/vacuum; 5. checks overboard-discharge water-pump pressure; 6. monitors oil-content monitor: a. ensures that equipment is not bypassed, sampling line is open, and flushing water is not being supplied to sensor; b. automatic valves are not operated in manual mode or disconnected from controlling devices; and c. no temporary hoses are used during operation; 7. checks for any unusual conditions or noises; 8. notifies the watch engineer of any unusual or unsafe conditions; and 9. ensures that no safety or pollution violations have occurred.

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment.	the candidate will monitor the lube-oil and fuel-oil separator systems.	The candidate: 1. checks plant's operational status; 2. checks the dirty-oil inlet temperature; 3. checks the dirty-oil inlet pressure; 4. checks the clean-oil discharge pressure; 5. checks the purifier-gear drive oil sump; 6. checks level in sealing-water head tanks; 7. checks inlet and outlet sight glasses; 8. checks heater steam supply pressure; 9. feels machine for vibration; 10. checks speed indicator for proper bowl speed; 11. determines the point of suction to include engine sump, settling tank, or other tank; 12. determines the point of discharge to include engine sump, day tank, or other tank; 13. checks priming- and wash-water pressure; 14. checks operating-water pressure; 15. checks control-air pressure; 16. checks for any unusual conditions or noises; 17. notifies the watch engineer of any unusual or unsafe conditions; and 18. ensures that no safety or pollution violations have occurred.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will monitor the compressed-air plants.	The candidate: 1. checks plant's operational status; 2. checks compressor oil level and adds oil as necessary; 3. checks compressor oil pressure, if applicable; 4. checks air-compressor suction pressure or air-inlet filter pressure differential indication as

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) appropriate; 5. checks air-compressor discharge pressure and compressed-air service-tank pressures; 6. checks for any unusual conditions or noises; 7. blows down intercoolers, after coolers, and receivers, checks associated refrigerated filter system and looks for clogged cooling fins; 8. notifies the watch engineer of any unusual or unsafe conditions; 9. identifies emergency cross-connect between ship's service air and control air systems; 10. identifies valves to direct "air on deck"; 11. identifies settings of standby equipment; and 12. ensures that no safety or pollution violations have occurred.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will monitor the refrigeration and air-conditioning plants.	The candidate: 1. checks plant's operational status; 2. checks compressor suctions and discharge pressures and temperatures; 3. checks compressor-oil level; 4. checks compressor-oil pressure and control-oil pressures; 5. checks receiver level; 6. checks liquid-line sight glass condition; 7. checks related cooling water supply strainers and filters, and cleans or blows down same when necessary; 8. checks refrigerated box temperatures and condition of the evaporator coils and drains for

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) icing; 9. notes the condition of the box door gaskets and circulating fans; checks condenser sea-water inlet and outlet temperatures; 10. checks walk-in temperature, if applicable; 11. checks chilled-water pump suction and discharge pressures, if applicable; 12. checks chilled-water inlet and outlet temperatures, if applicable; 13. checks chilled-water expansion-tank level, if applicable; 14. notifies the watch engineer of any unusual or unsafe conditions; and 15. ensures that no safety or pollution violations have occurred.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will monitor the distilling plant. ***	The candidate: 1. checks plant's operational status; 2. checks sea-water feed, brine, distillate, and ejector- pump suction and discharge pressures as appropriate; 3. checks air-ejector steam supply pressure, if applicable; 4. checks air or brine-ejector supply pressure, if applicable; 5. checks sea-water feed inlet temperature; 6. checks distillate outlet temperature; 7. checks shell vacuum as appropriate; 8. checks feed-water-heater inlet pressure and

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) temperature as applicable; 9. verifies and checks distillate-pump discharge to proper tank; 10. observes the position of the 3-way valve to ensure it is not tripped, unless in the case of high distillate salinity; 11. takes water-meter reading; 12. checks distillate salinity; and 13. notifies the watch engineer of any unusual or unsafe conditions.
		Aboard a vessel, in port or underway, or in an approved simulator or laboratory, given proper equipment,	the candidate will monitor the electrical generating plants.	The candidate: 1. checks plant's operational status; 2. checks generator rpm; 3. checks generator frequency; 4. checks generator output voltage; 5. checks generator output amperage; 6. checks generator kilowatt output; 7. checks generator kilovolt-amp output; 8. checks generator bearings' temperature and oil flow; 9. checks governor, turbocharger, and sump and reduction gear lube-oil levels; 10. checks the physical condition of pipes, tubing, and hoses for wear or leaks; 11. observes lube-oil and cooling-water temperatures and pressures; 12. observes air intake, fuel oil, and exhaust temperatures and pressures (if a motor plant); 13. observes the condition of air-intake filters;

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 14. reads fuel-oil meter, day-tank levels, and observes operation of viscosimeter, if installed; 15. checks for any unusual conditions or noises; 16. notifies the watch engineer of any unusual or unsafe conditions; and 17. ensures that no safety violations have occurred.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will determine tank- and pressure-vessel levels.	The candidate: 1. determines the liquid level of vented tanks and low-pressure pressure vessels fitted with tubular sight-glasses; 2. determines the liquid level of a high-pressure pressure vessel fitted with a high-pressure gauge glass or a remote level indicator; 3. determines the liquid level of a vented tank fitted with petcocks; 4. sounds the liquid level of two vented tanks (1 fuel- or lube-oil, and 1 water), fitted with sounding tubes, using a sounding tape, using innage or ullage method as appropriate; 5. determines the fluid level of a lube-oil sump fitted with a dipstick; 6. determines the liquid level of a vented tank fitted with a pneumercator; 7. determines the oil/water-interface of the slop tank; and 8. determines the level of a vented tank or pressure vessel fitted with remote reading-level gauges.

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		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will take up on a gate- or globe-valve stuffing-box gland.	The candidate: 1. determines the need to take up on the gate or globe stuffing-box glands; 2. checks for bent or scored stem; 3. checks the valve for ease of operation, ensuring that it is a candidate for taking up on the gland without the necessity of adding packing or re-packing of the valve; 4. checks the position of the gland to determine if it may be further tightened; 5. tightens alternately each gland nut slightly and evenly until the stem-to-bonnet leakage ceases; 6. inspects the gland to insure that it is square; and 7. checks the valve for ease of operation ensuring that the operation is not unacceptably difficult.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will add oil to the vented lube-oil sump of an auxiliary engine, reduction gear, or piece of deck machinery.	The candidate: 1. determines the need to add oil; 2. obtains an adequate amount of clean oil of proper grade and type; 3. removes the filler cap or plug; 4. pours oil through the filler cap or oil filler plug opening; 5. checks the oil level and verifies that it stands at the specified level; 6. replaces the filler cap or plug and leaves the area clean; and 7. ensures that no safety or pollution violations have occurred.

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment, and Zerk fitting equipped grease-lubricated bearing or a grease-cup-equipped grease-lubricated bearing,	the candidate will lubricate a grease-lubricated bearing.	The candidate accomplishes (A) or (B) below: (A) GREASE-FITTING-EQUIPPED BEARING 1. determines from the appropriate lubrication chart the type and grade of grease to use; 2. removes the fitting protective covering if fitted, drain plug, if fitted, and wipes the fitting free of grease and dirt with a rag; 3. removes air from the grease-gun hose by slowly squeezing the handle until grease starts to leave the fitting, and attaches the hose fitting to the bearing of the fitting; 4. slowly pumps in grease until a small amount of clean grease appears but, if the grease meets undue resistance, the candidate shall notify the watch engineer; and 5. replaces drain plug and protective cover on grease fitting. (B) GREASE-CUP-EQUIPPED BEARING The candidate: 1. determines from the appropriate lubrication chart the type and grade of grease to use; 2. obtains a sufficient clean quantity of correct grease; 3. removes the drain plug opposite the grease cup and ensures that the hole is free from hardening grease; 4. removes the cap from the grease cup; 5. wipes out the grease cup with a rag; 6. fills the grease cup with grease;

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 7. installs the cap onto the grease cup and forces grease into the bearing housing; 8. continues and repeats as necessary until grease begins to flow out the drain hole; 9. wipes excess grease from the bearing housing with a rag; and 10. reinstalls the drain plug.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will clean a basket-type sea-water strainer in any one of the following: • the main or auxiliary cooling system; • bilge and ballast system; • main or emergency fire pump; • air-conditioning or refrigeration plant; or • fresh-water generator system.	The candidate: 1. ascertains the need for cleaning a duplex strainer (but does not clean an in-service suction strainer); 2. ensures that the change-over handle is loosened; 3. ensures that the strainer being changed to is either pre-filled or is carefully filled by changing over without loss of pressure to protected machinery; 4. ensures that the selector handle is positioned on the element not being cleaned, then tightened; 5. loosens the idle strainer-lid fasteners or hold-down dogs as appropriate; 6. ensures that the strainer house is depressurized and that the selector-plug valve is not leaking; 7. removes fasteners or positions dogs clear out of the way; 8. lifts up strainer lid and sets it aside; 9. lifts up and removes the strainer basket; 10. cleans the strainer basket; 11. reinstalls the strainer basket; 12. inspects mating surfaces of housing and lid, and scrapes, cleans, and replaces gasket as necessary; 13. replaces and aligns the lid on top of the strainer

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) housing; 14. hand-tightens the bolts or firmly tightens hold-down dogs; 15. wrench-tightens the bolts or firmly tightens hold-down dogs; 16. cracks the strainer element selector-handle towards the idle strainer housing to slowly admit sea water and pressurize housing; 17. checks the strainer housing for leaks; 18. repositions the selector handle fully towards the strainer housing in service; 19. notifies the watch engineer of any unusual or unsafe conditions; and 20. ensures that no safety violations have occurred.
		Aboard a vessel, in port or underway, or in an approved simulator or laboratory, given proper equipment,	the candidate will monitor the main propulsion units.	The candidate: 1. monitors the main lube-oil temperature entering and leaving the main lube-oil cooler; 2. monitors the main lube-oil-tank level for condition of overflow, as appropriate; 3. monitors the lube-oil pressure available at the bearings and the oil-return temperature from each; ON MOTOR PLANTS: 4. monitors cooling water pumps, temperatures, pressures, and flow indicators, monitors head-tanks' levels, and maintains them on the orders of the officer-in-charge of the engine watch; 5. inspects fuel-injector leak-off piping, high-pressure delivery lines, and indicator cocks; 6. inspects fuel-oil service pumps, strainers, filters

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) and viscosimeter temperatures and pressures; 7. observes governor operation and lube-oil level, and observes operation of fuel-pump racks; 8. observes telescopic links and cylinder lubrication, if fitted; 9. checks operation of crankcase vacuum fans, mist detectors, and condition of explosion covers; 10. checks start air compressors, coolers, and air bottles; ON TURBINE PLANTS 11. checks main condenser for leaks and monitors condensate and circulator pumps; 12. checks air-ejector equipment and monitors main condenser vacuum; 13. checks turbine and reduction gear oil-flow sight glasses; 14. checks level of reduction gear sump; 15. checks steam pressure and water level in de-aerating feed tank; 16. notifies the watch engineer of any unusual or unsafe conditions, unusual sounds, or vibrations; and 17. ensures that no safety violations have occurred.
		Aboard a vessel, in port or underway, or in an approved simulator or laboratory, given proper equipment,	the candidate will monitor propulsion shafting and bearings.	The candidate: 1. checks all line shaft-bearing sump-oil levels; 2. checks all line shaft-bearing-oil temperatures; 3. checks all line shaft-bearing oiler rings; 4. checks the independent thrust-bearing sump level, where appropriate;

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 5. checks the independent thrust-bearing lube-oil sump temperature, where appropriate; 6. checks the independent thrust-bearing lube-oil cooler inlet and outlet temperatures, where appropriate; 7. checks the independent thrust-bearing lube-oil supply pressure, where appropriate; 8. checks the independent thrust-bearing gravity-head tank level, where appropriate; 9. checks the water-lubricated stern-tube stuffing box for proper leak-off, where appropriate; 10. checks the oil-lubricated stern-tube lube sump tank level where appropriate; 11. checks the oil-lubricated stern-tube lube-oil pressure where appropriate; 12. checks the oil-lubricated stern-tube oil temperatures where appropriate; 13. checks the oil-lubricated stern-tube inboard shaft seal for leakage if appropriate; 14. notifies the watch engineer of any unusual or unsafe conditions; and 15. ensures that no safety violations have occurred.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will inspect the steering gear.	The candidate: 1. correctly compares the rudder-angle mechanical-sliding scale with the electrical indicator, if fitted; 2. monitors the steering gear for leaks, noises, temperature, and oil levels; 3. tests the communication devices; 4. observes various linkages for wear, loosening, or

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) lost motion; 5. notes glands on main rams and rudderpost for leakage; 6. assists in adding oil to hydraulic sumps as required; 7. notifies the watch engineer of all unusual or unsafe conditions; and 8. ensures that no safety violations have occurred.
	*Safe working practices as related to engine-room operations**	Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will assist in cleaning a lube-oil or fuel-oil purifier to demonstrate safe working practices for the following: • Lifting heavy equipment; • Handling chemicals; • Working with delicate equipment; and • Cleaning the oil strainer to the oil-feed pump.	The candidate: 1. performs all tasks safely using all required safety equipment; 2. leaves the area safe and secure; 3. reports all unusual findings or unsafe conditions; 4. cleans the suction strainer; 5. ensures that all operations are in accordance with equipment manufacturer's recommended procedures; and 6. ensures that no safety violations have occurred.
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will assist in a pre-start check of a main- or auxiliary-diesel engine.	The candidate: 1. checks the general exterior of the engine for debris, leaks, or unsafe conditions; 2. checks the lube-oil levels in the sump and governor; 3. checks the cooling-water expansion tank;

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 4. checks the associated pumps as fitted; and 5. checks other associated equipment as fitted aboard the specific vessel, and as contained in assessor's checklist; and 6. ensures that no safety violations have occurred.
	*Basic environmental-protection procedures**	Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will pump the bilges to the holding tanks from one of the following locations: • Shaft alley; • Engine room; or • Cargo hold.	The candidate: 1. correctly lines up the bilge system and pumps the bilges dry to the correct holding tank in accordance with ship's procedures; 2. provides tank-level data and start/stop times to the officer-in-charge of the engine watch; and 3. ensures that no safety or pollution violations have occurred.
	*Use of appropriate internal communication systems**	Aboard a vessel, in port or underway, or in an approved simulator, given proper equipment,	the candidate will demonstrate the correct operation and use of all internal communications systems.	The candidate: 1. answers the phone stating his or her location, name, and rank; 2. correctly operates and communicates with remote stations by ship's phone; 3. correctly operates and communicates with remote stations by sound-powered phone; 4. correctly operates and communicates with remote stations by two-way radio; 5. conducts all operations in accordance with ship's procedures; and 6. ensures that no safety violations have occurred.

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
	*Engine-room alarm systems and ability to distinguish between the various alarms, with special reference to fire-extinguishing gas alarms**	Aboard a vessel, in port or underway, or in an approved simulator, given proper equipment, and upon being alerted to each of the following alarms (audible or visual),	the candidate will immediately identify the alarm and describe the appropriate response to the alarm (to include but not be limited to): • CO2-discharge alarm; • Fire or smoke alarm; • Vital and non-vital engine operational alarms, including lube-oil alarms (temperature and pressure), boiler alarms, fuel-oil tank high-level alarm, oily-water separator alarm, and high-bilge-water alarm; and • Vessel emergency signal or alarm.	For each alarm response, the candidate should be able to: 1. describe the system involved; 2. describe the system's purpose; 3. describe the seriousness of the alarm; and 4. notify the officer-in-charge of the engine watch of the alarm and his/her actions.
For keeping a safe boiler watch: Maintain the correct water levels and steam pressures	*Safe operation of boilers**	Aboard a vessel, with plant operating or in an approved operating simulator, or laboratory, given proper equipment,	the candidate will maintain the water level specified by the assessor for the waste heat, auxiliary boiler or main propulsion boiler when operating in manual mode. ****	The candidate: 1. maintains the water level of the boilers within +/- 2 inches of the specified level; and 2. ensures that no safety violations have occurred.

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
		Aboard a vessel, with plant operating or in an approved operating simulator, or laboratory, given proper equipment,	the candidate will maintain the steam pressures specified by the assessor for the main or waste heat or auxiliary boiler when operating in manual mode. ****	The candidate: 1. maintains the steam pressure of the boilers within +/- 5% of the specified pressure; and 2. ensures that no safety violations have occurred.
		Aboard a vessel, in port or underway, or in an approved simulator or laboratory, given proper equipment,	the candidate will record readings from the following types of waste heat or auxiliary-boiler gauges: • Pressure; • Temperature; and • Water level. ****	The candidate: 1. correctly determines and records the pressures within +/- 2%, temperatures within +/- 2% temperature gauge, and water levels within +/- 1 inch; and 2. ensures that no safety violations have occurred.

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
			the candidate will record readings from the following types of main-boiler gauges, including but not limited to: • Steam drum, fuel oil, and combustion air pressure; • Superheater, desuperheater, and fuel oil temperature; and • Steam drum water level. **	The candidate: 1. correctly determines and records the pressures within +/- 2%, temperatures within +/- 2% temperature gauge, and water levels within +/- 1 inch; and 2. ensures that no safety violations have occurred.
			the candidate will change out the burners in a main-propulsion boiler. **	The candidate: 1. checks to ensure that the clean burner is assembled properly; 2. inserts the clean burner; 3. tightens all connections; 4. opens the fuel and air-supply valves; 5. observes the flame and adjusts it as necessary; 6. secures dirty burner and removes it; and 7. ensures that no safety violations have occurred.
			the candidate will maintain a clean burner assembly. **	The candidate: 1. disassembles the dirty burner assembly; 2. places the tip in a container, furnace face upward, and soaks all other parts in kerosene until carbon is soft; 3. removes parts from kerosene; 4. cleans parts of carbon and debris;

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 5. reassembles the burner properly; 6. ensures that all operations are in accordance with manufacturer's recommended procedures; and 7. ensures that no safety violations have occurred.
		Aboard a vessel, in port or underway, or in an approved simulator or laboratory, given proper equipment, and under the proper supervision,	the candidate will manually fire a main-propulsion boiler. **	The candidate: 1. ensures that the burner valve is closed; 2. lines up the fuel-oil system to recirculate through heater (if fitted); 3. checks fuel-oil temperature, and reports when it is at the proper temperature as stipulated by the watch engineer; 4. adjusts the fuel-oil pressure; 5. sets the air damper and register doors; 6. starts the forced-draft fan and purges the furnace; 7. opens the burner-root valve; 8. lights the torch or activates lighter ignition (go to step 13); 9. inserts the torch through the manual light-off opening; 10. stands clear of open register doors; 11. holds the torch near and just under the atomizer tip; 12. cracks open the burner valve; 13. checks for ignition; opens the burner valve wide when ignition occurs and fire stays lit (closes burner valve and purges furnace if ignition does not occur or if fire goes out); 14. withdraws the torch (if used); 15. inspects the fire through the peep hole;

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 16. secures the fuel-oil re-circulating line and adjusts pressure for proper flame; 17. checks the periscope for smoke and adjusts the ratio of fuel to air needed for a clear stack; 18. notifies the watch engineer of any unusual or unsafe conditions; and 19. ensures that no safety violations have occurred.
Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch. Understand orders and be understood in matters relevant to watchkeeping duties.	Terms used in machinery spaces and names of machinery and equipment	Aboard a ship while underway,	the candidate will demonstrate the procedures and actions taken daily to assist in the operation of the soot blower system in the daily maintenance of the main propulsion boilers while at sea. **	When directed, the candidate will: 1. manually increase the deaerating feedwater tank (DFT) level in preparation for using the steam soot blowers; 2. verify that the drain valve of the soot blower steam line is open; 3. slowly open the soot blower steam isolation valves; 4. observe the output from the soot blower system drain, and secure the drain valve when it is determined that only steam is present; 5. inform the OICEW when the system is ready; 6. increase the speed of the forced-draft fan; 7. physically pull on any chain drive or manually rotate any crank to operate any non-air motor-driven soot blower in its proper sequence; 8. assist in maintaining a watch on the main propulsion boiler water level, steam, pressure, and DFT water level; 9. at the end of cycling all soot blowers, secure the steam isolation valve to the soot blowers; 10. open the soot blower steam line drain;

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 11. repeat the above operations for the second boiler; and 12. observe all safety and environmental requirements and wear proper safety equipment throughout the operation.
Operate machinery equipment and apply emergency procedures.	*Escape routes from machinery spaces**	Aboard a vessel, in port or underway, given proper equipment,	the candidate will locate all engine-room escape routes, describe the emergency-escape procedure for each, and perform escapes using the shortest open route and up an escape trunk (if so equipped).	The candidate: 1. locates all emergency-escape routes; 2. describes the operations and procedures appropriate to each means of escape (including the use of emergency-escape breathing devices); 3. demonstrates the correct means of escape via: (a) the shortest open route; and (b) an escape trunk, if so equipped; and 4. ensures that no safety violations have occurred.
	*Familiarity with the location and use of fire-fighting equipment in machinery spaces**	Aboard a vessel, in port or underway, given proper equipment, and using the fire-safety plan,	the candidate will locate each piece of fire-fighting and emergency equipment in the machinery spaces, beginning with the nearest, state its purpose, and describe its use or operation.	The candidate: 1. locates the nearest piece of each item named from the fire-control plan; and 2. correctly states the purpose and describes the use or operation of the item of equipment named.

STCW Competence	Knowledge, Understanding, and proficiency	Performance Condition	Performance Behavior	Performance Standard
		Aboard a vessel, in port or underway, or in a laboratory, given proper equipment,	the candidate will put a main or emergency fire-pump in service.	The candidate: 1. checks or opens all required suction and discharge valves; 2. correctly starts the pump; 3. ensures the fire-pump discharge pressure rises to proper operating pressure; 4. checks the running condition of the pump and motor; 5. properly secures the pump; and 6. ensures that no safety violations have occurred.

* *Italics denote STCW proficiency from Table A-III/4 of the STCW.*
** *Failure to meet this competency will restrict function to motor vessels only.*
*** *Failure to meet this competency will restrict function to motor vessels without distilling plants.*
**** *Failure to meet this competency will restrict function to motor vessels without waste heat or auxiliary boilers.*

PRACTICAL DEMONSTRATION
ASSESSMENT GUIDANCE and SAMPLE ASSESSMENT CONTROL SHEETS

RATING FORMING PART OF AN ENGINEERING WATCH
(Support Level)

STCW requires that candidates to be properly certified as competent, must successfully complete specific practical demonstrations to be performed and assessed by a qualified assessor either as part of on shore training or onboard a vessel by a certified engineering officer or rating, where appropriate. It is essential from a professional and pragmatic perspective, that the candidate be better than marginally capable to proficiently perform each of the identified tasks.

Further, the candidate's ability to proficiently perform each task, the candidate is required to serve onboard vessels of the appropriate propulsion mode(s) they are to be certified. To this extent, various simulators have been developed and may be viewed by training organizations as suitable graphic representations of the multitude of shipboard systems the candidate may operate once certified. As such, the training organization must be mindful that simulation may be useful in the training process. However, through the dedicated and sole use of simulation, as well as the inability to respond to conditions available in a practical surrounding which present tactile, visual, and audible cues essential in the starting, operating, and securing of shipboard systems the candidate may be denied an opportunity to achieve the appropriate outcome performance.

In addition to education and training, sea service and examination, the assessment of practical skills is the fourth facet of developing competency required of each candidate to be certificated at the support or operational or management levels defined by the STCW regulations.

To assist both training organizations and ship's engineering officers in evaluating the practical performance of required tasks, **SAMPLE** Assessment Control Sheets for each task listed in the table of enclosure (2) are attached to this instruction. Each assessor of engineering candidates for any level of certification must note the following:

1. The identified tasks are considered to commonly occur at least once during a vessel's trip/voyage regardless of the scheduled operation of the vessel. However, there are specific tasks which are considered to occur on a less frequent basis and have been determined as being more appropriate to be performed under controlled conditions in a laboratory to develop a consistent outcome performance of a training process, such as the "troubleshooting and repair of electrical equipment."

2. The performance assessment of skills of a candidate needs to be conducted as consistently as possible; not only from one vessel to another, but from one candidate to the next. To achieve consistency, **SAMPLE** Assessment Control Sheets have been developed and provided to reflect and promote an objective assessment of performance, i.e., either the candidate has grasped the operation or needs to improve and repeat the performance until proficient skills are demonstrated.

3. Each of the tasks to be assessed onboard a vessel can be performed during its normal operation and should not require a specific or special block of time to schedule and accommodate the candidate outside of the normal duties and operation of the vessel.

4. The attached **SAMPLE** Assessment Control Sheets were developed and based upon a specific steam or motor plant. Therefore, it has been recognized that the systems, specific equipment, operating pressures, temperatures, and flow rates will differ from one vessel to another. Accordingly, the representation of the specific tangible standards onboard your vessel will need to be modified by the assessor prior to any evaluation. This will require the vessel operator, or the training organization, or the onboard assessor to either modify the **SAMPLE** assessment control sheets as necessary or attach copied pages of the vessel's Operating Equipment Manual to the appropriate Control Sheet.

5. The **SAMPLE** assessment Control Sheets will be noted as typically containing details that reflect the necessary procedures to start-up, or operate, or shut down the systems. These details have been provided to assist the assessor in pin-pointing specific steps that may have been overlooked by the candidate during the performance demonstration; particularly when the steps are numerous and/or the process is lengthy and involved.

6. It is extremely important to note that when assessing a candidate's performance, the assessor will only sign off on that task which has been demonstrated by the candidate and only when the assessor has personally witnessed the demonstrated performance.

7. By signing off on a properly demonstrated task, the assessor is acknowledging that the performance was successfully conducted at the time of the demonstration. The demonstration, however, does not conclude that future successful performance by the candidate is assured or guaranteed.

8. Guidance for on-board assessors.

   8.1. Before assessing the performance of a particular skill or ability for the purpose of signing the Control Sheets, or initialing a Training Record Book (TRB) as appropriate, the assessor should (a) be qualified under the relevant regulations to perform the assessment, such as a licensed shipboard engineer; and (b) determine that the candidate is qualified on the basis of prior experience and/or training, to be assessed. The assessor should also review previously signed Control Sheets or the TRB to identify what assessments the candidate has already completed, and what assessment remain to be conducted.

   8.2. In designing an on-board assessment activity, the assessor should have clear, measurable, assessment objectives, such as those incorporated into the **SAMPLE** Assessment Control Sheets. These samples have been organized by reference to other related skills and abilities needed by the student to achieve the level of competence being pursued.

   8.3. The following guidelines are taken from section B-II/1 of the STCW Code for the conduct of assessment and should be taken into account:

   .1 The scope of knowledge is implicit in the concept of competence. Assessment of competence should, therefore, encompass more than the immediate technical requirements of the job, the skills and tasks to be performed, and should reflect the broader aspects needed to meet the full expectations of competent performance as a ship's officer. This includes relevant knowledge, theory principles, and cognitive skills that, to varying degrees, underpin all levels of competence. It also encompasses proficiency in what to do, how and when to do it, and why it should be done. Properly applied, this will help to

ensure that a candidate can:

.1.1 work competently in different ships and across a range of circumstances;
.1.2 anticipate, prepare for, and deal with contingencies; and
.1.3 adapt to new and changing requirements.

.2 The criteria for evaluating competence (column 4 of tables A-III/1, A-III /2,or A-III /4, as appropriate, of the STCW Code) identify primarily in outcome terms the essential aspects of competent performance. They are expressed so that assessment of a candidate's performance can be made against them and be documented by the signing of the Assessment Control Sheets.

.3 Evaluation of competence is the process of:

.3.1 collecting sufficient valid and reliable evidence about the candidate's knowledge, understanding and proficiency to accomplish the tasks, duties and responsibilities listed in column 1 of tables A-II/1, A-III /2,or A-III /4, as appropriate; and
.3.2 judging the performance of the demonstration against the criteria specified in the standard.

.4 The arrangements for evaluating competence should be designed as an objective assessment that can provide evidence about the candidate's competence through direct observation of work activities.

8.4. Before conducting the assessment, the assessor should:

.1 familiarize him or herself with the assessment criteria provided on each Assessment Control Sheet to ensure that the assessment activities will be effective and comprehensive;

.2 incorporate and modify scenarios provided by the sample Assessment Control Sheets as necessary that involve a sequence of events that require the candidate to exercise good judgment in a realistic amount of time and that require the candidate to make effective use of all relevant and available human resources, hardware and information;

.3 ensure the necessary equipment is operational and will be available throughout the assessment activity;

.4 be able to articulate the parameters or thresholds which will, under the circumstances, represent an acceptable level of performance;

.5 clearly explain to the candidate the purpose of the activity and the steps he or she is to take during the demonstration of the skill or ability;

.6 ensure that the candidate (a) can concentrate on the task(s) at hand; (b) will not receive unauthorized assistance during the assessment process; and (c) is not in a position to "learn the test" by watching the performance of other candidates, as in the case of troubleshooting equipment or a system into which a constant fault has been introduced;

.7 inform the candidate as to the scope of performance to be assessed, the length of time allowed for the demonstration, and the effect of failing to perform part of the

demonstration properly (such as omitting a critical action or performing a step out of sequence when a particular order is essential).

8.5. The assessor should continuously observe the candidate during performance of the skill or ability and should use the Assessment Control Sheets to note where the candidate has changed the order of the process or missed a minor step.

- The assessor should ***ONLY*** sign the Control Sheet when the performance is completed satisfactorily.

- In the event the candidate does not perform a critical phase of the assessment exercise at an acceptable level of proficiency, the assessment should be immediately suspended.

- When a candidate is required to repeat an assessment, the performance demonstration should not be repeated until the candidate has been afforded the opportunity to perform the task properly in a practice setting.

8.6. Successful or acceptable performance should be based on the candidate's proven ability to safely perform:

.1 the assigned tasks in accordance with competency criteria identified on the Control Sheets;

.2 such tasks in a manner which demonstrates that the required level of skill, knowledge and ability was demonstrated purposefully without excessive hesitation; and

.3 such tasks in a manner that demonstrates sound and professional judgment.

8.7. Unsuccessful or unacceptable performance may be based on the candidate's failure to prove his or her ability in accordance with paragraph 8.5, or because the candidate otherwise performs improperly, in the judgment of the assessor, based on events such as the following:

.1 an action, or lack of action, by the candidate that required corrective action or intervention by the assessor to prevent injury, damage, or the development of a hazardous condition;

.2 the candidate failed to use proper procedures (including appropriate communication procedures); or

.3 the candidate failed to take prompt corrective action when required.

8.8. Normally, a demonstration of skill immediately following instruction should not be relied upon as the sole basis for judging competence. After learning a particular skill, the candidate should be given the opportunity to repeat and practice the task(s) until fully capable of correctly performing them in accordance with the vessel's established procedures, insuring safety of operation and avoiding pollution of the environment.

8.9. When the assessor is inexperienced, arrangements should be made for his or her early assessment activities to be monitored with the aim of ensuring that assessment activities are conducted in the most effective manner possible.

9. To ensure the candidate is provided proper credit when submitting an application to be evaluated for a credential following the satisfactory completion of the performance of all practical tasks identified, one or more of the following documents should be forwarded to the National Maritime Center at LST-NMC-Courses@ballston.uscg.mil. Regardless of the method employed to provide the candidate credit of completion, each signed Assessment Control Sheet must be retained by the vessel, the candidate, or the training organization as appropriate for the purpose of validating either a summary, a training record book, or record of training. It is preferred that the representative copies of the Assessment Control Sheets and/or summary sheet be forwarded as a single document file in electronic format for one of the following conditions:

9.1 Sample Assessment Control sheets for each company vessel that has been ***modified*** to suit the operating conditions on board a vessel, **OR**;

9.2 Sample Assessment Control sheets for each company vessel when each control sheet has been provided with an appropriate, yet ***separate page*** from a vessel's operation equipment manual (OEM), **AND one of the following**:

9.3 an *assessment summary sheet* that lists and identifies each corresponding Assessment Control Sheet for each task the candidate is to perform on board the vessel, sufficient space to indicate the following:

- name of the vessel
- vessel service
- type of main propulsion machinery
- vessel horsepower
- candidate's full name
- candidate's dates of service onboard the vessel
- capacity the candidate served on board the vessel
- name of the assessor
- license and/or certificate held by the assessor
- assessor's assigned position on board the vessel
- date the assessment was successfully performed
- a space beside each identified task for the assessor to initial (in addition to the signing of the control sheet,) **OR**;

9.4 a copy of each control sheet that will be signed; **OR**,

9.5 a copy of an approved program certificate of completion.

10. All candidates must successfully demonstrate tasks indicated as **"All Propulsion Modes."** Credit for a specific propulsion mode will be issued only when **ALL** tasks have been completed for **"Steam Propulsion"** and/ or **"Motor Propulsion."**

SUMMARY OF ASSESSMENT STANDARDS
RATING FORMING PART OF AN ENGINEERING WATCH (Support Level)

STCW Competence	Knowledge, Understanding and Proficiency (KUP)	Assessments		Assessment Guidelines Table reference Page Number
		Control Sheet Number	Task	
1. Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch;	1. Engine-room watchkeeping procedures	RFPEW-1-1A	Engine Room Round	3
		RFPEW-1-1B	Monitor Electricity Generating Plants	9/10
		RFPEW-1-1C 1/2	Monitor Heavy Fuel Oil **** or Lube Oil/Marine Diesel Oil Purification Plants	6
		RFPEW-1-1D	Monitor Compressed Air Plants	6
		RFPEW-1-1E	Monitor Refrigeration And Air Conditioning Plants	7/8
		RFPEW-1-1F	Determine Tank and Pressure Vessel Levels	10
		RFPEW-1-1G	Adjust Potable Water Tank Level and Pressure Range Settings**	4
		RFPEW 1-1H 1/2	Monitor distilling plant operation	8/9
		RFPEW-1-1I 1/2	Monitor Main Engine	14/15
		RFPEW-1-1J	Monitor Propulsion Shafting & Bearings	15/16
		RFPEW-1-1K	Inspect Steering Gear	16/17
	2. Safe working practices as related to engine room operations	RFPEW-1-2A	Add Clean Oil	11
		RFPEW-1-2B	Lubricate Bearings	12/13
		RFPEW-1-2C	Clean Sea Strainer	13/14
		RFPEW-1-2D	Clean Lube Oil or Fuel Oil Purifier	17

STCW Competence	Knowledge, Understanding and Proficiency (KUP)	Assessments		Assessment Guidelines Table reference Page Number
		Control Sheet Number	Task	
		RFPEW-1-2E	Take Up on Valve Stuffing Box Gland	11
		RFPEW-1-2F	Take on Fresh Water	4
	3. Basic environmental protection procedures	RFPEW-1-3A	Pump Bilges	18
		RFPEW-1-3B	Monitor Oily Water Separators	5
		RFPEW-1-3C	Monitor Sewage Treatment Plants	4/5
2. Understand orders and be understood in matters relevant to watch keeping duties	1. Terms used in machinery spaces and names of machinery and equipment	RFPEW-2-1A	Relieve the watch	2
		RFPEW-2-1B	Hand over the watch	2
		RFPEW-2-1C	Assist in Pre-Start Check of Diesel Engine	17/18
	2. Use of appropriate internal communication systems	RFPEW-2-2A	Operate Internal Communications Systems	18
		RFPEW-2-2B	Log Bell Signals	
	3. Engine room alarm systems and ability to distinguish between the various alarms, with special reference to fire-extinguishing gas alarms	RFPEW-2-3A	Respond to Alarms	19

STCW Competence	Knowledge, Understanding and Proficiency (KUP)	Assessments		Assessment Guidelines Table reference Page Number
		Control Sheet Number	Task	
3. For keeping a safe boiler watch: Maintain the correct water levels and steam pressures	1. Safe operation of boilers	RFPEW-3-1A	Maintain Boiler Water Level **** (**)	19
		RFPEW-3-1B	Maintain Boiler Steam Pres. **** (**)	20
		RFPEW-3-1C	Read Boiler Gauges **** (**)	20/21
		RFPEW-3-1D	Change Out Burners **	21
		RFPEW-3-1E	Maintain Clean Burner Assembly **	21/22
		RFPEW-3-1F	Assists in Lighting Off Main Boiler **	22
		RFPEW-3-1G	Manually fire a main propulsion boiler during maneuvering. **	22
		RFPEW-3-1H	Soot blower operation. **	23
4. Operate emergency equipment and apply emergency procedures	Escape routes from machinery spaces	RFPEW-4-1A	Locate Escape Routes	24
	Familiarity with the location and use of fire-fighting equipment in machinery spaces	RFPEW-4-2A	Locate Fire Fighting Equipment	24
		RFPEW-4-2B	Put Fire Pump In Service	25

* Italics denote STCW proficiency from Table A-III/4 of the STCW.
** Failure to meet this competency will restrict function to motor vessels only.
*** Failure to meet this competency will restrict function to motor vessels without distilling plants.
**** Failure to meet this competency will restrict function to motor vessels without waste heat or auxiliary boilers.

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1A (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Properly make a round during watch

PERFORMANCE STANDARD:

1. inspects, monitors, and checks system parameters of all auxiliary systems and machinery, and main propulsion machinery, checks operating procedures, temperatures, flow and level indicators, and collects readings for log book entry;
2. inspects bilges and pump as necessary; notes piping condition in bilges and conducts visual inspection of sea chests;
3. checks machinery spaces for all signs of fire, flooding, loss of lighting, and electric shock hazard;
4. wipes up all spilled oil;
5. Inspects all system and machinery piping for signs of leaks;
6. monitors all applicable strainer and filter pressure drops;
7. checks electric motors and machinery for overheating;
8. investigates any abnormal sounds, vibrations, or odors, as well as loose fittings, nuts, bolts, flanges, clamps, hangers, and connections;
9. checks for any gear adrift or machinery guards not in place;
10. notifies watch engineer of any unusual or unsafe conditions;
11. takes appropriate action to correct any unusual or unsafe conditions; and
12. ensures that no safety violations have occurred.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1B/1 (MOTOR PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor electricity generating plants

PERFORMANCE STANDARD:

1. checks plant's operational status;
2. checks generator rpm;
3. checks generator frequency;
4. checks generator output voltage;
5. checks generator output amperage;
6. checks generator kilowatt output;
7. checks generator kilovolt-amp output;
8. checks generator bearings' temperature and oil flow;
9. checks governor, turbocharger, and sump and reduction gear lube-oil levels as applicable;
10. checks the physical condition of pipes, tubing, and hoses for wear or leaks;
11. observes lube-oil and cooling-water temperatures and pressures;
12. observes air intake, fuel oil, and exhaust temperatures and pressures;
13. observes the condition of air-intake filters;
14. reads fuel-oil meter and day-tank levels as applicable;
15. checks for any unusual conditions or noises;
16. notifies the watch engineer of any unusual or unsafe conditions; and
17. ensures that no safety violations have occurred.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1B/2 (STEAM PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor electricity generating plants

PERFORMANCE STANDARD:

1. checks plant's operational status;
2. checks generator rpm;
3. checks generator frequency;
4. checks generator output voltage;
5. checks generator output amperage;
6. checks generator kilowatt output;
7. checks generator kilovolt-amp output;
8. checks generator bearings' temperature and oil flow;
9. checks generator lube-oil sump levels;
10. checks the physical condition of pipes, tubing, and hoses for wear or leaks;
11. observes lube-oil and cooling-water temperatures and pressures;
12. observes auxiliary condenser vacuum and exhaust temperatures;
13. observes level of condensate in auxiliary condenser hot well;
14. checks for any unusual conditions or noises;
15. notifies the watch engineer of any unusual or unsafe conditions; and
16. ensures that no safety violations have occurred.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1C/1 (MOTOR PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor heavy fuel oil purification plant

PERFORMANCE STANDARD:

1. checks purifier's operational status;
2. checks the dirty-oil inlet temperature;
3. checks the dirty-oil inlet pressure;
4. checks the clean-oil discharge pressure;
5. checks the purifier-gear drive oil sump level;
6. checks level in sealing-water head tank;
7. checks inlet and outlet sight glasses for flow;
8. checks heater steam supply pressure;
9. feels machine for vibration;
10. checks speed indicator for proper bowl speed;
11. determines the point of suction to be settling tank;
12. determines the point of discharge to be day tank;
13. checks operating water pressure;
14. checks control air pressure;
15. checks for any unusual conditions or noises;
16. notifies the watch engineer of any unusual or unsafe conditions; and
17. ensures that no safety or pollution violations have occurred.

Candidate		SSN	
Assessor		Position	
Vessel or Course		License No.	Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence
RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1C/2 (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor lube oil or marine diesel oil purification plant

PERFORMANCE STANDARD:

1. checks purifier's operational status;
2. checks the dirty-oil inlet temperature;
3. checks the dirty-oil inlet pressure;
4. checks the clean-oil discharge pressure;
5. checks the purifier-gear drive oil sump level;
6. checks heater steam supply pressure, as applicable;
7. checks machine for vibration;
8. checks speed indicator for proper bowl speed;
9. determines the point of suction to be either engine sump, or settling tank, or other tank;
10. determines the point of discharge to be either engine sump or other lube oil storage tank;
11. checks for any unusual conditions or noises;
12. notifies the watch engineer of any unusual or unsafe conditions; and
13. ensures that no safety or pollution violations have occurred.

Candidate	SSN
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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence
RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1D (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor compressed air plants

PERFORMANCE STANDARD:

1. checks plant's operational status;
2. checks compressor oil level and adds oil as necessary;
3. checks compressor oil pressure, if applicable;
4. checks air-compressor air-inlet filter pressure differential;
5. checks air-compressor discharge pressure and compressed-air service-tank pressures;
6. checks for any unusual conditions or noises;
7. blows down intercoolers, after coolers (if applicable), and receivers, checks associated refrigerated filter system and looks for fouling of cooling fins;
8. notifies the watch engineer of any unusual or unsafe conditions;
9. identifies emergency cross-connect between ship's service air and control air systems (if applicable);
10. identifies valves to direct "air on deck" and their open/closed status;
11. identifies settings of standby equipment; and
12. ensures that no safety or pollution violations have occurred.

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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1E (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor refrigeration and air conditioning plants

PERFORMANCE STANDARD:

1. checks plant's operational status;
2. checks compressor suction pressure;
3. checks compressor discharge pressure;
4. checks compressor-oil level;
5. checks compressor-oil pressure and control-oil pressures;
6. checks receiver level;
7. checks liquid-line sight glass flow condition;
8. checks refrigerated box temperatures and condition of the evaporator coils and drains for icing;
9. notes the condition of all refrigerated box door gaskets and operation of circulating fans;
10. checks condenser sea-water inlet and outlet temperatures;
11. checks chilled-water pump suction and discharge pressures, if applicable;
12. checks chilled-water inlet and outlet temperatures, if applicable;
13. checks chilled-water expansion-tank level, if applicable;
14. notifies the watch engineer of any unusual or unsafe conditions; and
15. ensures that no safety or pollution violations have occurred.

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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1F (ALL PROPULSON MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Determine tank and pressure vessel levels

PERFORMANCE STANDARD:

1. determines the liquid level of vented tanks and low-pressure pressure vessels fitted with tubular sightglasses;
2. determines the liquid level of a high-pressure pressure vessel fitted with a high-pressure gauge glass and /or remote level indicator;
3. determines the liquid level of a vented tank fitted with petcocks;
4. sounds the liquid level of at least two vented tanks (fuel and/or lube oil and/or water), fitted with sounding tubes, using an ullage sounding tape;
5. determines the fluid level of a lube oil sump fitted with a dipstick;
6. determines the liquid level of a vented tank fitted with a pneumercator; or other remote reading level indicating device; and
7. determines the oil/water interface level of the slop tank

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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1G (STEAM PROPULSION)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Adjust the water level set point and the pressure range for potable water tank

PERFORMANCE STANDARD:

1. correctly adjusts pressure range within +/- 5% of operating condition for potable water tank;
2. establishes water level in tank within one inch of set point level; and
3. ensures that no safety violations have occurred.

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Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1 H/1 (MOTOR PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures.

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment.

PERFORMANCE BEHAVIOR: Monitors Operation of Fresh Water Distillation Plant.

PERFORMANCE STANDARD:

1. verifies distiller salt water feed pump is discharging to distiller shell and eductors at required pressure;
2. monitors and records jacket cooling water flow to salt water feed heater submerged tube bundle maintaining a 10°C temperature differential between inlet and outlet;
3. verifies that salt-water flow to salt water feed heater minimum temperature is at or above 165°F;
4. monitors and records all salinity cell readings and verifies that three-way dump valve has not tripped and recirculating distillate back to distiller;
5. verifies that distillate pump is operating, suction line gage glass is at half full, and that distillate level is indicated to be at or below .25 GPG (4.24 PPM); and
6. verifies tank to be replenished (potable water or distilled water) is lined-up as noted on engine room status board.

Candidate	SSN
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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1H/2 (STEAM PLANTS

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitors Operation of Fresh Water Distillation Plant

PERFORMANCE STANDARD:

1. verifies that overboard brine pump is discharging at required pressure;
2. verifies distiller salt water feed pump discharging at required pressure;
3. opens steam root valve to distiller unit steam air ejectors;
4. monitors and records steam supply pressure to salt water feed heater;
5. regulates desuperheater condensate flow to maintain steam supply temperature of no higher than 210° F to salt water feed water heater if live steam is used;
6. verifies half of a gage glass is maintained in salt water feed heater hot well;
7. adjusts salt-water flow from salt water feed heater to maintain minimum temperature of feed water at 165°F to first stage;
8. observes spray pattern of feed water and level of water at bottom of flash chamber;
9. monitors and records all salinity cell readings and verifies that three-way dump valve has not tripped;
10. verifies that distillate pump is operating, suction line gage glass is at half full, and that distillate level is indicated to be at or below .25 GPG (4.24 PPM); and
11. verifies tank to be replenished (potable water or distilled water) is lined-up as noted on engine room status board.

Candidate	SSN
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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1I/1 (MOTOR PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor the main diesel engine

PERFORMANCE STANDARD:

1. monitors the main lube -oil cooler inlet and outlet temperatures;
2. monitors the lube-oil pressure to the engine;
3. monitors the oil-return temperature from each bearing;
4. monitors cooling water pump temperature and pressures, and maintains them on the orders of the officer-in-charge of the engine watch;
5. inspects fuel-injector leak-off piping, high-pressure delivery lines, and indicator cocks;
6. inspects fuel-oil booster pump strainers, filters and pressures;
7. inspects fuel oil service pump strainers, filters and pressures;
8. inspects fuel oil and viscosimeter set point as applicable;
9. observes governor operation and lube-oil level;
10. observes fuel-pump and/or fuel injector rack settings;
11. observes telescopic links and cylinder lubrication, if fitted;
12. checks operation of crankcase vacuum fans, mist detectors, and condition of explosion covers;
13. checks start air compressors temperature and pressures;
14. monitors main compressed air receiver pressure;
15. drains main compressed air receiver;
16. notifies the watch engineer of any unusual or unsafe conditions, unusual sounds, or vibrations; and
17. ensures that no safety violations have occurred.

Candidate _____ SSN _____

Assessor _____ Position _____

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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1I/2 (STEAM PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor the main turbines

PERFORMANCE STANDARD:

1. monitors the main lube-oil temperature entering and leaving the main lube-oil cooler;
2. monitors the main lube-oil-sump level;
3. monitors the main lube-oil-gravity tank for continuous overflow;
4. monitors the lube-oil pressure;
5. monitors the oil-return temperature from each bearing and indicators for continuous flow;
6. checks main condenser water boxes for leaks;
7. monitors main condensate and main circulator pumps;
8. checks air-ejector equipment and monitors main condenser vacuum;
9. checks auxiliary exhaust steam pressure, shell pressure and water level in deaerating feed tank;
10. monitors main condenser vacuum and engine exhaust temperature;
11. notifies the watch engineer of any unusual or unsafe conditions, unusual sounds, or vibrations; and
12. ensures that no safety violations have occurred.

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Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1J (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures.

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment.

PERFORMANCE BEHAVIOR: Monitor propulsion shafting and bearings.

NOTE: *Assessment Control Sheet may need to be modified as necessary to cover alternative equipment, such as: roller bearings, water lubricated stern tube, etc.*

PERFORMANCE STANDARD:

1. checks all line shaft bearing oil sump levels;
2. checks all line shaft bearing oiling rings for rotation with shaft;
3. checks oil lubricated stern tube lube sump tank level where appropriate;
4. Checks oil lubricated stern tube lube oil pressure where appropriate;
5. checks oil lubricated stern tube oil temperatures where appropriate;
6. checks oil lubricated stern tube inboard shaft seal for leakage if appropriate;
7. notifies watch engineer of any unusual or unsafe conditions; and
8. ensures that no safety violations are observed.

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Assessor	Position	
Vessel or Course	License No.	Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-1K (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor the steering gear

PERFORMANCE STANDARD:

1. correctly compares rudder angle mechanical sliding scale with electrical indicator, if fitted;
2. monitors steering gear for leaks, noises, pressure, temperature and oil levels;
3. tests communication devices;
4. observes various linkages for wear, loosening, or lost motion;
5. notes glands on main rams and rudderpost for leakage;
6. adds oil to hydraulic sumps as required; and notes quantity added;
7. notifies the watch engineer of all unusual or unsafe conditions; and
8. ensures that no safety violations have occurred.

Candidate _____ SSN _____

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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-2A (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Replenish oil

PERFORMANCE STANDARD:

1. determines the need to add oil;
2. obtains an adequate amount of clean oil of proper grade and type;
3. removes the filler cap or plug;
4. pours oil through the filler cap or oil filler plug opening;
5. checks the oil level and verifies that it stands at the specified level;
6. replaces the filler cap or plug and leaves the area clean; and
7. ensures that no safety or pollution violations have occurred.

Candidate _____ SSN _____

Assessor _____ Position _____

Vessel or Course _____ License No. _____ Date _____

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-2B (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Lubricate grease-lubricated bearings

PERFORMANCE STANDARD:

(A) GREASE LUBRICATED BEARING FITTED WITH ZIRC OR ALEMITE FITTING:

1. determines from appropriate lubrication chart the type and grade of grease to be used;
2. obtains grease gun with appropriate grease, hoses, and connections;
3. removes pipe plug from bearing housing if fitted;
4. wipes grease fitting free of grease and dirt with a rag;
5. removes air from grease gun hose by slowly squeezing handle until grease starts to exit fitting;
6. attaches hose fitting to bearing grease fitting;
7. slowly pumps in grease until grease just begins to appear at bearing lip seals. If high resistance is met, ceases attempt and notifies watch engineer;
8. removes hose fitting from bearing grease fitting;
9. wipes zirc fitting free of grease with a rag; and
10. replaces pipe plug in bearing housing if fitted after 20 minutes of operation to allow excess grease to escape.

(B) GREASE CUP EQUIPPED GREASE LUBRICATED BEARING:

1. determines from appropriate lubrication chart the type and grade of grease to be used;
2. obtains sufficient clean quantity of correct grease;
3. removes drain plug opposite grease cup and ensures hole is free from hardened grease;
4. removes cap from grease cup;
5. wipes out grease cap with rag;
6. fills grease cap with grease;
7. reinstalls cap onto grease cup gently screwing cap on to force grease into bearing housing;
8. continue as necessary until grease begins to ooze out of drain hole;
9. wipes excess grease from bearing housing with a rag; and
10. reinstalls drain plug.

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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-2C (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Clean a sea-water strainer

PERFORMANCE STANDARD:

1. ascertains the need for cleaning a duplex strainer;
2. ensures that the selector handle is positioned over the element housing not being cleaned;
3. insures strainer housing is depressurized and that selector plug valve is not leaking;
4. loosens idle strainer lid fasteners or hold down dogs as appropriate;
5. removes fasteners or positions dogs clear out of the way;
6. lifts off strainer lid and sets aside;
7. lifts out strainer basket;
8. cleans strainer basket;
9. reinstalls strainer basket;
10. inspects housing and lid mating surfaces; scrapes, cleans and replaces gasket as necessary;
11. replaces and aligns lid on top of strainer housing ;
12. tightens bolts or firmly tightens hold down dogs;
13. closes off strainer cover vent;
14. slowly changes over strainer; checking for housing leaks, significant pressure drop, etc;
15. cracks open, then closes off vent to bleed off trapped air; and
16. notifies watch engineer of any unusual or unsafe conditions.

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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-2D (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Safe working practices as related to engine room operations

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Assists in cleaning a lube oil or fuel oil purifier to demonstrate safe working practices for the following:

- Lifting heavy equipment;
- Assist in placing purifier on line;
- Putting steam on heaters
- Handling chemicals
- Working with delicate equipment
- Cleaning an oil strainer

PERFORMANCE STANDARD:

1. performs tasks safely using all required safety equipment (safety shoes, safety glasses, explosion-proof lighting and electrical devices, hearing protection, gloves, hard hat, respirator mask, etc) and adheres to all safety procedures (verifies tag-out procedures, notifications, safe lifting techniques, etc.);
2. assists in disassembly of purifier using appropriate tools as provided;
3. cleans all sludge deposits from individual disks, bowl top, and bowl;
4. assists in reassembling purifier, reinstalling all disks and in numerical order;
5. leaves area safe and secure;
6. reports all unusual findings or unsafe conditions;
7. cleans the suction strainer; if applicable; and
8. ensures that no safety violations are observed.

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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-2E (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Adjust a gate or globe valve stuffing box gland

PERFORMANCE STANDARD:

1. determines for the need to take up on gate or globe stuffing box gland;
2. checks for bent or scored stem;
3. checks valve for ease of operation, ensuring that it is a candidate for taking up on the gland without the necessity of adding packing or re-packing the valve;
4. checks position of gland to determine if it may be further tightened;
5. tightens alternately each gland nut, by one flat at a time and evenly until stem to bonnet leakage ceases;
6. inspects the gland to insure that it is perpendicular to the valve stem; and
7. checks valve opening/closing for ease of operation ensuring that operation is not unacceptably difficult.

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TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-2F (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Take on fresh water

PERFORMANCE STANDARD:

1. determines from the watch engineer or equivalent, the order in which to fill the fresh water tanks;
2. lines up filling system properly;
3. retrieves properly designated hose from storage;
4. flushes out dock connection;
5. assists taking water sample for testing before taking on water;
6. properly takes on fresh water;
7. secures fresh water manifold after task is complete; and
8. uses proper procedure to uncouple, drain, and stow hose.

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CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence
RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-3A (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Basic environmental protection procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Pump the bilges to holding tank from one of the following locations:

- Shaft alley;
- Engine room;
- Cargo hold.

PERFORMANCE STANDARD:

1. correctly lines up the bilge system to bilge well(s) to be pumped and to the correct holding tank in accordance with ship's procedures;
2. pumps the bilges until steady indication that bilges are dry (loss of pump suction);
3. provides tank-level data and start/stop times to the officer-in-charge of the engine watch; and
4. ensures that no safety or pollution violations have occurred.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-3B (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Basic environmental protection procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor the oily water separators

PERFORMANCE STANDARD:

1. checks oily-water separator's operational status;
2. checks bilge-water holding tank level;
3. checks oily-water-separator chamber pressure or vacuum;
4. checks filling related pressure/vacuum;
5. checks overboard-discharge water-pump pressure;
6. monitors oil-content monitor:
   a. ensures that equipment is not bypassed, sampling line is open, and flushing water is not being supplied to sensor;
   b. automatic valves are not operated in manual mode or disconnected from controlling devices; and
   c. no temporary hoses are connected or used during operation;
7. checks for any unusual conditions or noises;
8. notifies the watch engineer of any unusual or unsafe conditions; and
9. ensures that no safety or pollution violations have occurred.

Candidate _____ SSN _____

Assessor _____ Position _____

Vessel or Course _____ License No. _____ Date _____

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence
RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-1-3C (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Basic environmental protection procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Monitor sewage treatment plants

NOTE: *Assessment Control Sheet may be modified with regards to monitoring sewage holding tanks in lieu of a marine sanitation treatment system, such as vessels without auxiliary and/or waste heat boilers wand/or with distilling plants.*

PERFORMANCE STANDARD:

1. checks the plant's operational status;
2. checks the destination of "black water" sewage;
3. checks sewage circulating and overboard discharge pump pressures;
4. checks sewage circulating and overboard discharge pump mechanical seals for leakage;
5. checks air compressor discharge pressure;
6. checks chemical batch tank for proper operating level;
7. checks for any unusual conditions or noises;
8. notifies watch engineer of any unusual or unsafe conditions; and
9. ensures that no safety or pollution violations are observed.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-2-1A **(ALL PROPULSION MODES)**

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Properly relieve the watch

PERFORMANCE STANDARD:

1. reports for duty 15 minutes before the hour to make a quick round of the machinery spaces to determine the general operational status and satisfactory condition;

2. determines from the off-going watch:
   (a) operational status of the plant;
   (b) unusual alarms or conditions occurring during the previous watch;
   (c) standing orders;
   (d) maintenance performed during the previous watch;
   (e) on-going repairs affecting plant operations; and
   (f) outstanding safety conditions; and

3. seeks clarification from the off-going watch or engineer if information was not clearly understood.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-2-1B (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; Understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Properly hand over the watch

PERFORMANCE STANDARD:

1. in preparation for relief, ensures that all assigned routine duties are completed before the conclusion of the watch;

2. communicates to the oncoming watch:
   (a) operational status of the plant;
   (b) unusual alarms or conditions occurring during previous watch;
   (c) standing orders;
   (d) maintenance performed during previous watch;
   (e) on-going repairs affecting plant operations; and
   (f) outstanding safety conditions; and

3. ensures that the watch relief is fully aware of the operational status of the plant.

Candidate		SSN	
Assessor		Position	
Vessel or Course		License No.	Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-2-1C (MOTOR PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Safe working practices as related to engine room operations

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Assist in a pre-start check of a main or auxiliary diesel engine

PERFORMANCE STANDARD:

1. checks general exterior of engine for debris, lube oil, fuel oil, and cooling water leaks, or unsafe conditions;
2. checks lube oil levels in sump and governor, adds oil as necessary, and recording quantity if added;
3. checks cooling water expansion tank and fills to normal level, recording quantity added;
4. checks associated pumps, as fitted, for indications of leaks or abnormalities;
5. notifies OICEW of abnormalities and status of engine for starting; and
6. ensures that no safety violations are observed.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-2-2A (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Use of appropriate internal communication systems

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Demonstrate the correct operation and use of all internal communications systems

PERFORMANCE STANDARD:

1. answers phone stating location, name, and rank;
2. correctly operates and communicates with remote stations via ship's phone;
3. correctly operates and communicates with remote stations via sound powered phone;
4. correctly operates and communicates with remote stations via two way radio;
5. all operations are conducted in accordance with ship's procedures; and
6. ensures that no safety violations are observed.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-2-2B (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; understand orders, and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine-room watchkeeping procedures

PERFORMANCE CONDITION: Aboard a ship, given proper equipment

PERFORMANCE BEHAVIOR: Upon receiving each of the bell signals, the candidate will log the bells as indicated from full ahead to full astern including stop and finished with engines

PERFORMANCE STANDARD:

1. when directed, obtains correct "counter" and "fuel oil meter" readings at standby or departure or arrival;
2. correctly acknowledges main engine direction and speed by matching engine order telegraph with order from the bridge;
3. correctly enters appropriate graphic bell signal symbol and logs with correct time; and;
4. entries are legible.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-2-3A (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Carry out a watch routine appropriate to the duties of a rating forming part of an engine-room watch; understand orders and be understood in matters relevant to watch keeping duties

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Engine room alarm systems and ability to distinguish between the various alarms, with special reference to fire-extinguishing gas alarms

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Upon being alerted to each of the following alarms (audible and/or visual), the candidate will immediately identify the alarm and describe the appropriate response of a person in his/her position to the alarm:

- CO2-discharge alarm;
- Fire or smoke alarm;
- Vital and non-vital engine operational alarms, including, but not limited to lube-oil alarms (temperature and pressure), boiler alarms, fuel-oil tank high-level alarm, oily-water separator alarm, and high-bilge-water alarm; and
- Vessel emergency signal or alarm.

PERFORMANCE STANDARD:

For each alarm response, the candidate should be able to:

1. silence the alarm;
2. describe the system involved;
3. describe the system's purpose;
4. describe the seriousness of the alarm; and
5. notify the officer-in-charge of the engine watch of the alarm and his/her actions.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-3-1A (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: For keeping a safe boiler watch: Maintain the correct water levels and steam pressures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Safe operation of boilers

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Maintain the water level specified by the assessor for the main or the auxiliary boiler

PERFORMANCE STANDARD:

1. maintains the boiler water level within +/- 2 inches of specified level through use and manipulation of feed water controller while standing a boiler watch; and
2. ensures that no safety violations are observed.

Candidate _____ SSN _____

Assessor _____ Position _____

Vessel or Course _____ License No. _____ Date _____

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence
RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-3-1B (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: For keeping a safe boiler watch: Maintain the correct water levels and steam pressures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Safe operation of boilers

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Maintain the steam pressures specified by the assessor in the main or the auxiliary boiler

PERFORMANCE STANDARD:

1. maintains the boiler steam pressure within +/- 5% of specified pressure through use and manipulation of fuel/air ratio controller while standing a boiler watch; and
2. ensures that no safety violations are observed.

Candidate _____ SSN _____

Assessor _____ Position _____

Vessel or Course _____ License No. _____ Date _____

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-3-1C (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: For keeping a safe boiler watch: Maintain the correct water levels and steam pressures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Safe operation of boilers

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Candidate will record readings from the boiler gauges:

- Pressure;
- Temperature; and
- Water level.

PERFORMANCE STANDARD:

1. correctly determines and records the indicated pressures within +/- 2%, indicated temperatures within +/- 2%, and observed water levels within +/- 1-inch; and
2. ensures that no safety violations are observed.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-3-1D (STEAM PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: For keeping a safe boiler watch: Maintain the correct water levels and steam pressures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Safe operation of boilers

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Change out burners

PERFORMANCE STANDARD:

1. checks clean burner barrel is available and properly assembles with required sprayer plate;
2. secures burner atomizer valve to burner to be cleaned;
3. removes burner and transfers to burner cleaning bench using appropriate insulated gloves and cleans floor plates of dripped oil occurring during the transfer;
4. inserts clean burner; tightening all connections;
5. opens burners register air vanes and prepares to relight burner using torch;
6. opens burner atomizer valve and adjusts combustion air to maintain economy brown haze in stack; and
7. ensures that no safety violations are observed.

Candidate _____ SSN _____

Assessor _____ Position _____

Vessel or Course _____ License No. _____ Date _____

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-3-1E (STEAM PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: For keeping a safe boiler watch: Maintain the correct water levels and steam pressures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Safe operation of boilers

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Clean a burner assembly

PERFORMANCE STANDARD:

1. disassembles dirty burner;
2. places tip in a container, furnace face upward, and soaks all other parts in kerosene until carbon has softened;
3. removes parts from kerosene;
4. cleans parts of carbon and debris with non-ferrous tools;
5. stows disassembled burner barrel;
6. all operations are in accordance with manufacturer's recommended procedures; and
7. ensures that no safety violations are observed.

Candidate _____ SSN _____

Assessor _____ Position _____

Vessel or Course _____ License No. _____ Date _____

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW- 3-1F (STEAM PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: For keeping a safe boiler watch: Maintain the correct water levels and steam pressures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Safe operation of boilers

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Assists in manually light off a main propulsion boiler

PERFORMANCE STANDARD:

1. ensures auxiliary and main feed checks are closed;
2. opens all air registers to idle boiler furnace;
3. starts idle boiler forced draft fan for minimum five-minute purge;
4. engages and sets fuel oil service system master (solenoid) valve;
5. opens fuel oil service system recirculation valve;
6. verifies fuel oil manifold pressure, and sets to minimum 125 psi;
7. verifies steam drum air cock, superheater vent, and superheater drain valves are open;
8. verifies that a minimum of one inch of water is visible at bottom of gage glass;
9. readies burner with small orifice sprayer plate tip (BWG 53);
10. positions burner in register (furthest from superheater tubes.) and closes all air registers, with exception of register w/burner in place;
11. adjusts and locks air damper to "light-off" position;
12. verifies F.O. has attained light-off temperature of 210° F;
13. ignites torch and inserts through register inspection hole and positions by burner tip;
14. adjusts air register to prevent extinguishing torch;
15. opens burner root valve, and then F.O. atomizer valve to ignite burner;
16. adjusts combustion air to maintain brown haze issuing from stack;
17. closes F.O. recirculating valve;
18. periodically observes periscope/light intensity to modify supply of combustion air to prevent "smoking;"
19. verifies steam flow through superheater vent;
20. secures steam drum air cock at 15 psig;
21. verifies oncoming boiler pressure has attained pressure within 50 psi of on-line boiler working pressure;
22. secures burner if boiler is not to be placed on line; and
23. closes superheater drains and vent.

Candidate _____ SSN _____

Assessor _____ Position _____

Vessel or Course _____ License No. _____ Date _____

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW- 3-1G (STEAM PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: For keeping a safe boiler watch: Maintain the correct water levels and steam pressures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Safe operation of boilers

PERFORMANCE CONDITION: Aboard a ship, in port or underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: Fire a main propulsion boiler during maneuvering

PERFORMANCE STANDARD:

1. has been directed by OICEW one hour prior to maneuvering to have required burners prepared and ready;
2. ensures auxiliary and main feed checks are closed;
3. verifies that fuel oil service system master (solenoid) valve is properly engaged for each boiler;
4. verifies that fuel oil service system recirculation valve is closed;
5. verifies the operation of the fuel oil service pump and normal discharge pressure is maintained;
6. verifies water is visible in boiler gauge glass at half or normal drum level;
7. readies all burners with varying orifice sprayer plates per vessel maneuvering operations;
8. verifies F.O. temperature is steady at 210° F.;
9. when directed that engine sea speed will be reduced to maneuvering speed, fuel to at least one burner in each boiler will be secured;
10. combustion air will be reduced to the proper fuel/air ratio by reducing forced draft fan speed, and or air register opening, or combustion control board air ratio controller, or through a combination of events as is necessary;
11. periodically observes periscope/light intensity to modify supply of combustion air to prevent "smoking;"
12. continually monitors boiler water level, modulating feed pump speed as necessary, yet avoiding feed water flow changes as an over reaction during periods of shrink and swell due to engine speed changes; and
13. ensures that as engine speed is increased, combustion air will be increased prior to fuel flow increase by increasing forced draft fan speed, and or air register opening, or combustion control board air ratio controller, or through a combination of events as is necessary.

Candidate _____ SSN _____

Assessor _____ Position _____

Vessel or Course _____ License No. _____ Date _____

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-3-1H (STEAM PLANTS)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: For keeping a safe boiler watch: Maintain the correct water levels and steam pressures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Safe operation of boilers.

PERFORMANCE CONDITION: Aboard a ship while underway, or in an approved simulator or laboratory, given proper equipment

PERFORMANCE BEHAVIOR: the candidate will demonstrate the procedures and actions taken daily to assist in the daily maintenance of the main propulsion boilers while at sea through the operation of the soot blower system (**)(****)

PERFORMANCE STANDARD: When directed, the candidate:

1. increases the deaerating feedwater tank (DFT) level in preparation for using the steam soot blowers;
2. verifies that the drain valve of the soot blower steam line is open;
3. slowly opens the soot blower steam isolation valves;
4. observes the output from the soot blower system drain, and secures the drain valve when it is determined that only steam is present;
5. informs the OICEW when the system is ready;
6. increases the speed of the forced-draft fan;
7. physically pulls on any chain drive or manually rotates any crank to operate in its proper sequence any non-air motor-driven soot blower;
8. assists in maintaining a watch on the main propulsion boiler water level, steam, pressure, and DFT water level; and
9. at the end of cycling all soot blowers, secures the steam isolation valve to the soot blowers; opens the soot blower steam line drain.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-4-1A (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Operate emergency equipment and apply emergency procedures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Escape routes from machinery spaces

PERFORMANCE CONDITION: Aboard a ship, in port or underway, given proper equipment

PERFORMANCE BEHAVIOR: Locate all engine room escape routes, describe the emergency escape procedure for each and perform escapes using the shortest open route and up an escape trunk (if so equipped)

PERFORMANCE STANDARD:

1. locates all emergency escape routes;
2. describes the operations and procedures appropriate to each means of escape (including the use of emergency escape breathing devices);
3. demonstrates the correct means of escape via:
   (a) shortest open route, and
   (b) an escape trunk, if so equipped; and
4. ensures that no safety violations are observed.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-4-2A (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Operate emergency equipment and apply emergency procedures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Familiarity with the location and use of fire-fighting equipment in machinery spaces

PERFORMANCE CONDITION: Aboard a ship, in port or underway, given proper equipment.

PERFORMANCE BEHAVIOR: Using the fire safety plan, the candidate will locate each piece of equipment in the machinery space, beginning with the nearest, state its purpose and describe its use or operation.

PERFORMANCE STANDARD:

1. locates the nearest piece of each item named from the list of fire fighting and emergency equipment;
2. correctly states the purpose and describes the use or operation of the item or equipment named; and
3. ensures that no safety violations are observed.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date

CONTROL SHEET
TABLE A-III/4 Specification of Minimum Standard of Competence RATING FORMING PART OF AN ENGINEERING WATCH

ASSESSMENT NO. RFPEW-4-2B (ALL PROPULSION MODES)

FUNCTION: Marine Engineering at the Support Level

COMPETENCE: Operate emergency equipment and apply emergency procedures

KNOWLEDGE, UNDERSTANDING & PROFICIENCY: Familiarity with the location and use of fire-fighting equipment in machinery spaces

PERFORMANCE CONDITION: Aboard a ship, in port or underway, given proper equipment

PERFORMANCE BEHAVIOR: Put a main or emergency fire pump in service

PERFORMANCE STANDARD:

1. checks or opens all required suction and discharge valves;
2. correctly starts pump;
3. fire pump discharge pressure rises to operating pressure;
4. checks running condition of pump and motor;
5. properly secures pump; and
6. ensures that no safety violations are observed.

Candidate	SSN
Assessor	Position
Vessel or Course	License No. / Date