57

TAB 57

DECLARATION OF JAMES SNYDER

I am the Branch Chief for the Branch of the AMCOM Acquisition Center responsible for the M270 and M270A1 launchers and the Industrial Engineering Services (IES) for these launchers.

When I was first assigned to this Branch in 2001, I found that not all Technical Direction Letters (TDLs) being issued under the then current IES contract (DAAH01-98-C-0157) were being reviewed and approved by contracting officers in this branch.

With the award in 2001 of IES Contract No. DAAH01-01-C-0141, and thereafter with subsequent MLRS IES contracts, I required, and still require, that TDLs issued under those contracts be reviewed, approved, and issued by contracting officers in the AMCOM Acquisition Center. I instituted this policy to add another layer of review, and review by a contracting officer, based on an abundance of caution—not because prior practice of at times omitting contracting officer approval of TDLs was illegal or violated any formal policy of which I am aware. Indeed, to the contrary, it is my understanding that contracting officers often are not involved in the issuance of TDLs.

Dated: August 11, 20008

FIRST

58

TAB 58

1.0 OBJECTIVE AND SCOPE

1.1 OBJECTIVE. The Multiple Launch Rocket System (MLRS) Fire Control System (FCS) requires improvement of the existing FCS design to mitigate obsolescence, reduce operational and sustainment burden, and accommodate M270 Family of Munitions (MFOM) future needs and growth. In addition, the threat has grown since initial fielding of this Fire Support Weapon System. The System/Segment Specification (MIS-46307) defines the requirements for the improved Fire Control System (FCS). This Statement of Work (SOW) defines the requirement to design, develop, document, fabricate, test and qualify a FCS in accordance with (IAW) MIS-46307 and integrate it into the M270 MFOM launcher. The goal of the EMD contract effort is the design, development, testing and documentation of an IFCS which results in a production configuration with an average unit cost no greater than the existing FCS in which the IFCS is replacing (excludes contract options).

1.2 SCOPE. The development and integration contractor, hereinafter referred to as the "contractor", shall furnish all labor, services, materials, facilities, equipment (except specified Government Furnished Equipment/Property - GFE/GFP); shall provide all the technical, planning, management, and other efforts required to complete the tasks as outlined in this SOW; and shall deliver all hardware, software, reports, briefings, design documents, and other material as specified and scheduled. In the performance of this work, the contractor shall make use of any appropriate data or information developed under previous Government contracts and ensure no duplication of effort. The contractor, in coordination with the requiring element of the U.S. Army Missile Command (MICOM), shall mark all data prepared under this contract with the appropriate distribution statement and the applicable export control warning notice IAW MIL-STD-1806.

2.0 APPLICABLE DOCUMENTS. All applicable military specifications, military standards, and other publications shall be as specified in the contract Document Summary List (DSL).

3.0 REQUIREMENTS

3.1 PROGRAM MANAGEMENT

3.1.1 Program Management. The contractor shall establish a program management organization to manage the contractor's technical, schedule, and cost performance of the contract. The contractor shall establish and implement interface control measures to resolve issues, establish technical interfaces, and refine and maintain interface measures. The

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TAB 59

PERFORMANCE REQUIREMENTS
for the
MULTIPLE LAUNCH ROCKET SYSTEM (MLRS)
IMPROVED LAUNCHER MECHANICAL SYSTEM (ILMS)

1.0 Objectives. This requirement is an Engineering and Manufacturing Development (EMD) contract for modification of the Multiple Launch Rocket System (MLRS) M270 launcher with Improved Fire Control System (IFCS), designated M270A1. The modification is to add an Improved Launcher Mechanical System (ILMS). The primary objectives of the ILMS are to reduce the time required to reach aim point from the stowed position and reduce the reload time. Reduction in weight and improvement in reliability are also objectives. It is anticipated that achievement of these objectives will result in reduced Operational and Support (O&S) costs. This document provides the required specifications for design, development, integration, and testing of modifications to the current M270 launcher, to include the IFCS currently under development, which will meet these objectives. Delivery of Performance Specifications (PS) for procurement of modification kits and spares is required.

2.0 Reference Documents. The following documents are listed for contractor reference to identify the hardware/software interfaces and environmental conditions for the ILMS, which are the same as the M270 with IFCS (M270A1).

2.1 MIS-26432, System Specification for Multiple Launch Rocket System (MLRS)

2.2 MIS-46307, System Specification for the MLRS Improved Fire Control System (IFCS)

2.3 MIS-29985, Prime Item Specification to Self Propelled Launcher Loader for the MLRS

2.4 MIS-30225, Nuclear Survivability Criteria for MLRS

2.5 AR 70-38, Research, Development, Test, and Evaluation of Material for Extreme Climatic Condition

2.6 AT-SS-1004-501, System Specification for Vehicle, Transport General Support Rocket System

2.7 SCD 8750113, Engine 500 HP, Diesel

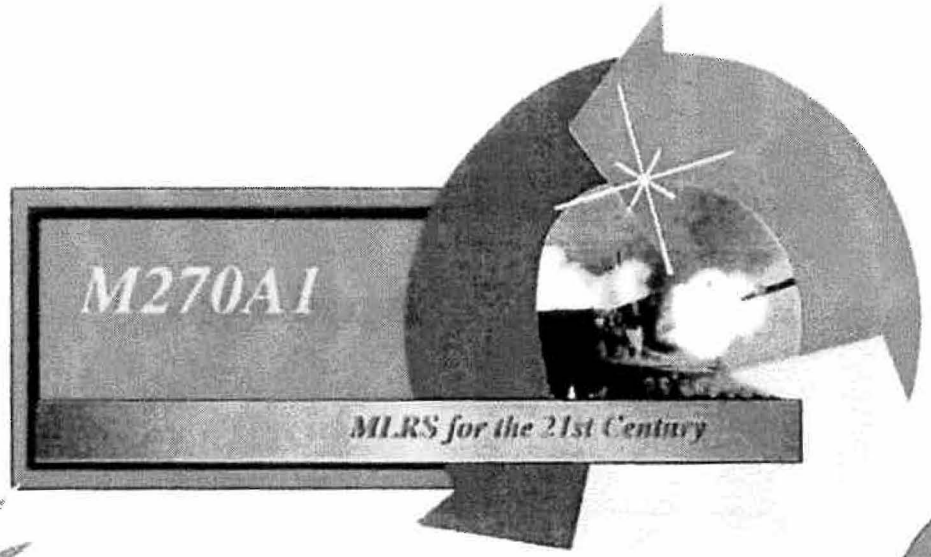
60

TAB 60

IFCS / ILMS HARDWARE DECISION

MLRS

MILESTONE DECISION REVIEW



MLRS

IFCS

MLRS

ILMS

28 May 1998

Introduction

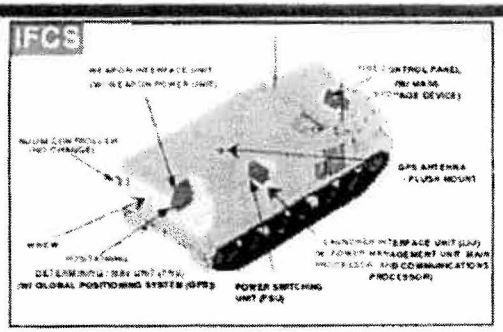
By

[redacted]

IFCS / ILMS HARDWARE DECISION

MLRS

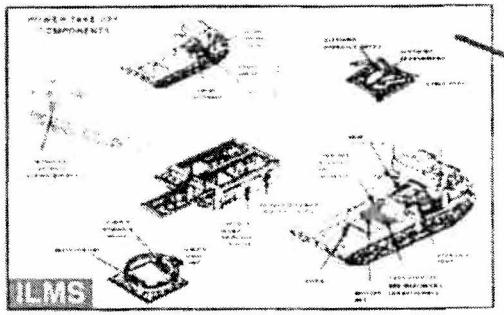
MFOM SYSTEM INTERFACES



- CURRENTLY IN EMD (LMVS)
- SYSTEM INTEGRATION TEST NOV 97 - APR 98
- IOTE AUG 99

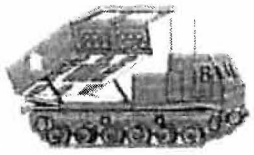
S/W

EMBEDDED GPS



- CURRENTLY IN EMD (LMVS)
- SYSTEM INTEGRATION TEST JUL 98 - JAN 99
- IOTE AUG 99

FAST SLEW RATES



M270A1

GMLRS

Current Capability M270

M26, M26A1 / A2, M28, M28A1

ATACMS BLK I

GUIDANCE & CONTROL SECTION

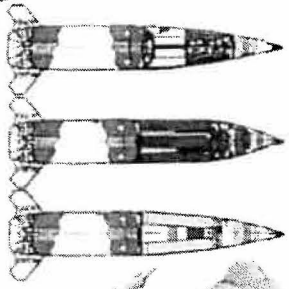
INTERFACE CONTROL DEVICE

INTERFACE CONTROL DEVICE

CARGO SECTION

MOTORS

ICD TO LAUNCHER



ATACMS BLK IA

ATACMS BLK II

ATACMS BLK IIA

MSTAR

PB8-97(03001.1 06 MAY 98

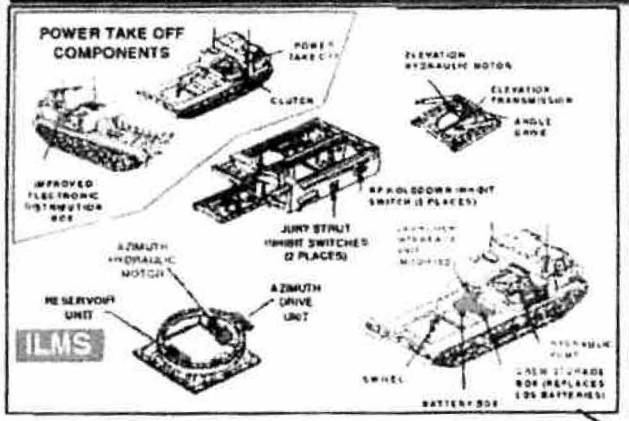
M270A1 Overview

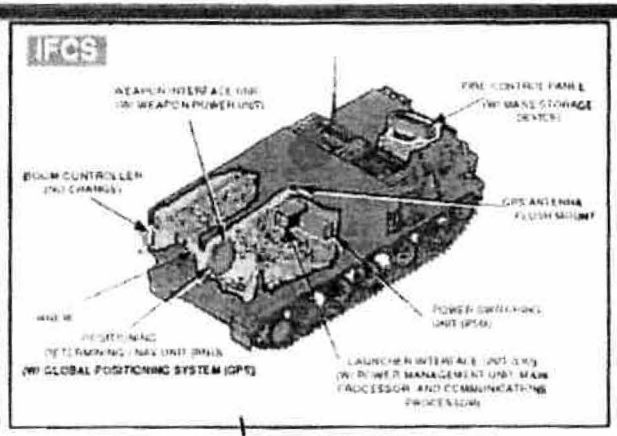
By

[redacted]

IFCS / ILMS HARDWARE DECISION

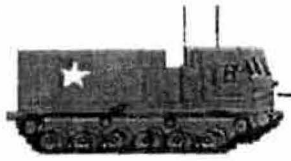
M270 → M270A1 UPGRADE PROGRAM EXECUTION





REBUILD

- APPLICATION OF ECPs / MWOs TO A DESIGNATED BASELINE
- TEST MAJOR ASSEMBLIES (TRANSMISSION, ENGINE, FINAL DRIVES, ETC). REPLACE IF OUT OF TOLERANCE
- WELD ANY CRACKS

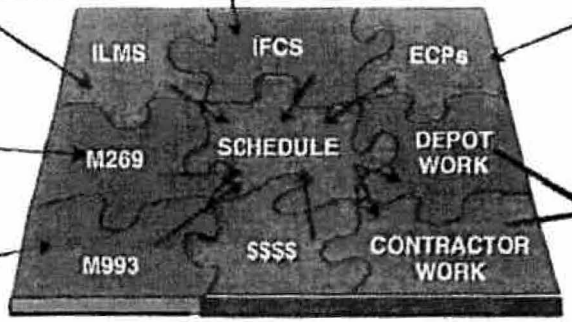


M270

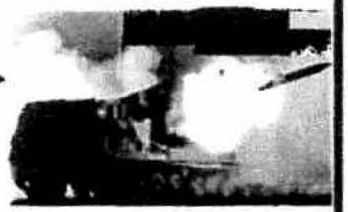
LLM (M269)

CARRIER M993

RETURN FROM FIELD



M270A1



10 - 15 YEARS ADDITIONAL LIFE

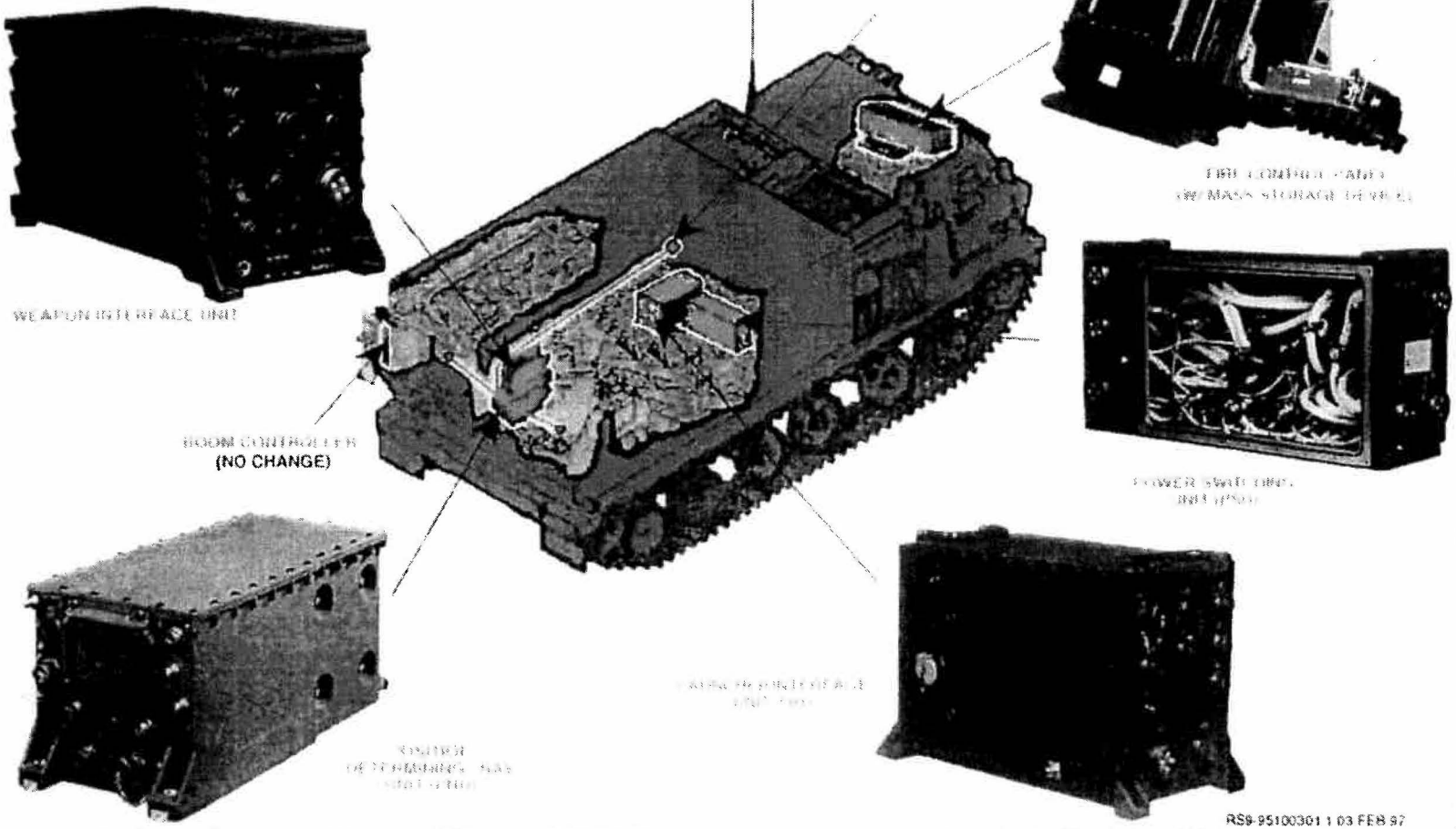
M270 + IFCS + ILMS = M270A1

OLD LT70-95073101
NEW RS9-95092901 12 DEC 97

IFCS / ILMS HARDWARE DECISION

MLRS

IFCS COMPONENT BREAKOUT

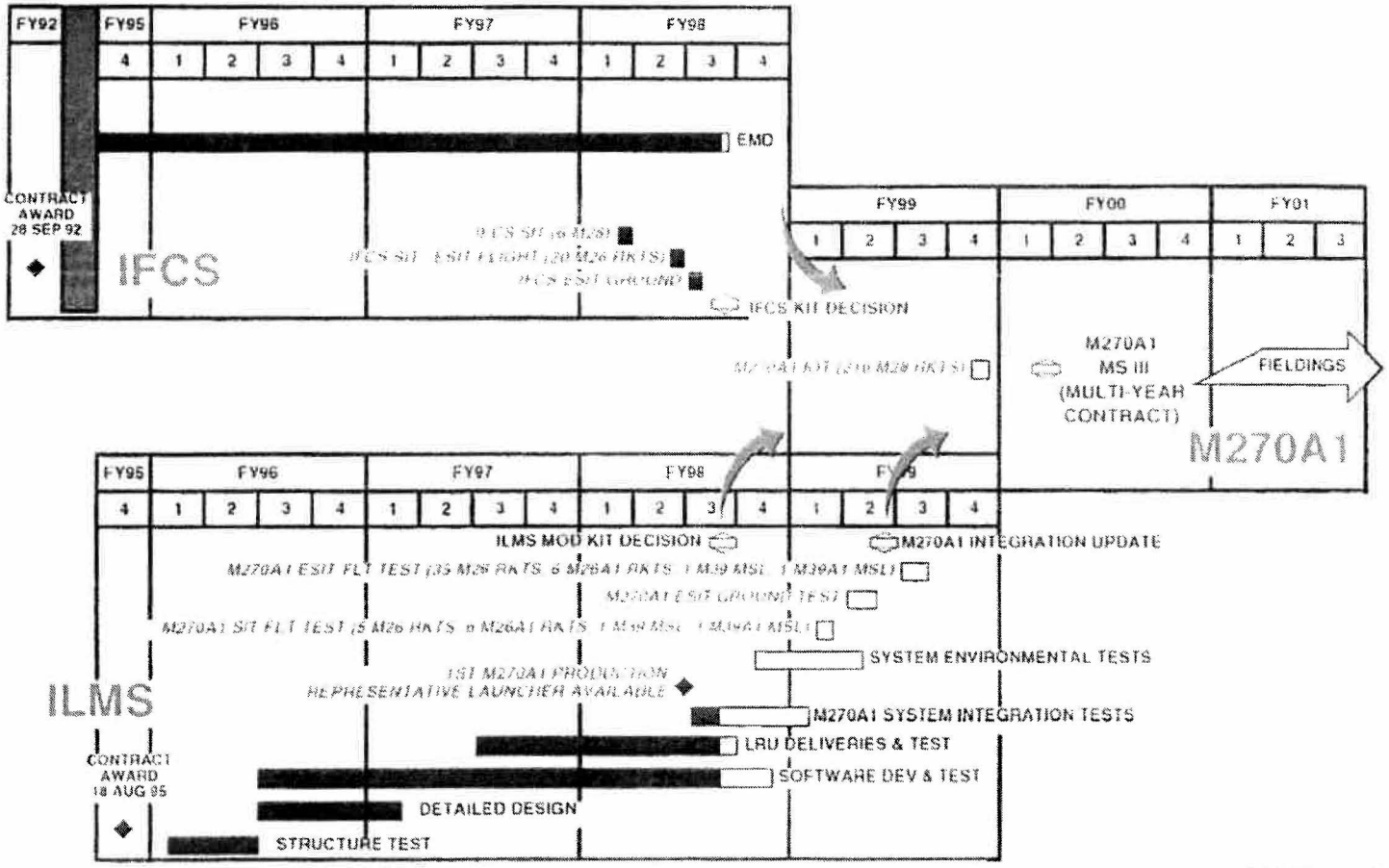


RS9-95100301 1 03 FEB 97

IFCS / ILMS HARDWARE DECISION

MLRS

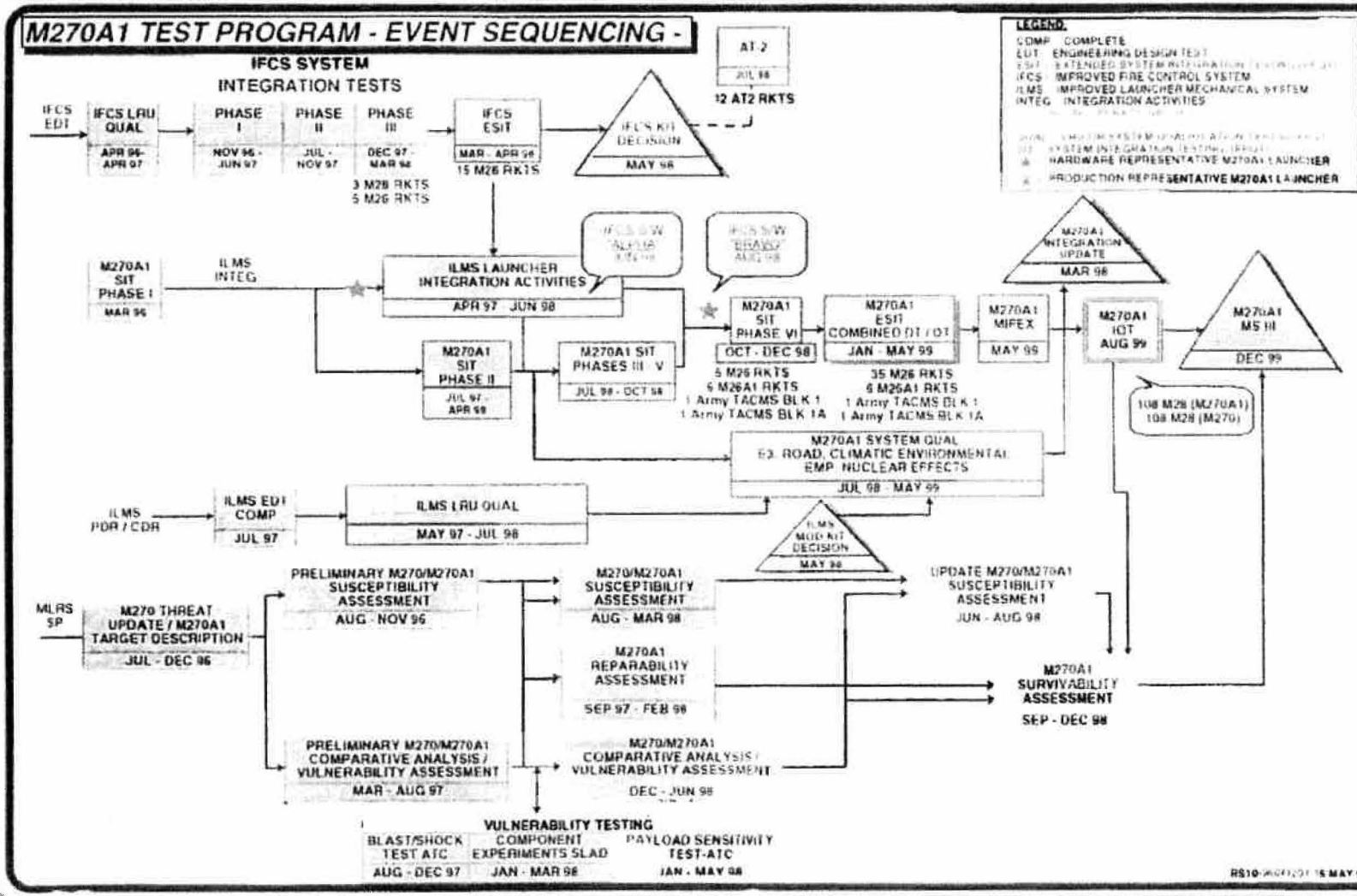
MLRS UPGRADE LAUNCHER SCHEDULE



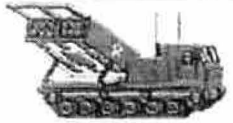
IFCS / ILMS HARDWARE DECISION

MLRS

M270A1 TEST PROGRAM - EVENT SEQUENCING -



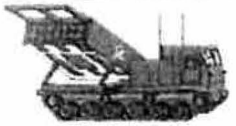
IFCS / ILMS HARDWARE DECISION



IFCS REVIEW & REVISE IPT

Consists Of:	Concur
FID	✓
CAD	✓
TSM-RAMS	✓
RDEC	✓
OEC	✓
DOTE	✓
AMCOM Procurement	✓
IMMC	✓
ODCSOPS	✓
SARDA	✓
ODCSLOG	✓
PEO TM	✓

IFCS / ILMS HARDWARE DECISION



OPERATIONAL CAPABILITY/EFFECTIVENESS

Based On System Assessment

OPERATIONAL EFFECTIVENESS	OPERATIONAL SUITABILITY	OPERATIONAL SURVIVABILITY
MEDIUM RISK*	MEDIUM RISK*	Survivability will be assessed at the M270A1 System Level
• Software Maturity	• RAM – Low Risk	
	• ILS – Medium Risk – WIU and FCP Retest	

*OPTEC Assessed Risk Level To Enter M270A1 Phase I IFCS Kit Production

OPTEC CONCLUSION

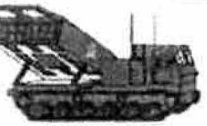
"The achievement of all Exit Criteria supports proceeding into IFCS Kit Production."

IFCS / ILMS HARDWARE DECISION

IFCS RISK AREA	COMMENT
Threat	Threat has not diminished; requirement still valid.
Technology	Technology has been proven-out through years of research and application.
Design/Engineering ▽ - HW Design/Engineering ▭ - SW Design/Engineering	Environmental issues (vibration and cold) associated with the MSD has been mitigated with the decision to add a solid state MSD that would be available for use during M270A1 ESIT. The option selected for first phase production HW obsolescence mitigation is through a firm-fixed price contract and a guaranteed lot buy. Because significant design activity will likely be required during production to keep a producible design available, for the M270A1 production multi-year contract the option of LRU Acquisition by Performance Specifications with contractor logistics support is being considered. SW maturation will continue through all phases of the M270A1 development. SW will continue to be monitored and fine tuned from EMD through fielding.
Manufacturing	Manufacturing and Production Planning will continue as the M270A1 Acquisition Plan transitions to Phases II and III.
Support	Risk is minimized and all logistics areas are progressing and will meet requirements as designed.
Cost	Cost challenges in unit cost, obsolescence mitigation and nonrecurring cost. Funding is currently adequate to support MLRS IFCS from EMD into kit procurement.
Schedule	Schedule risk driven by obsolescence redesign and system integration. LMVS has given Advanced Work Authorization (AWA) to subcontractors.
System Integration/Transition	The migration from Phase I to future M270A1 production emphasizes the importance of identifying system integration risks. This assessment has been completed for M270A1 and reflects a moderate risk.

Low ◇ Low-Moderate ▽ Moderate ▭ Moderate-High ● High

IFCS / ILMS HARDWARE DECISION



FIRE CONTROL PANEL (FCP)

ISSUE

- Mass Storage Device (MSD) Has Not Passed Qualification
  - Spinning Disk MSD Will Not Operate Reliably At Temperatures Below -20°C (Spec Requirement -32°C)
  - Experienced Performance Failures During Vibration Testing

MITIGATION MEASURE

- Develop Solid State (SS) MSD
  - SS MSD Chosen Currently Used Under Bradley Program
  - Qualified During Abrams A3 Testing; As Much As Possible Will Be Accepted By Similarity
  - Additional Environmental Tests In Nov 98 For Repackaging And Performance
  - Available For Use At M270A1 (ILMS) ESIT And For All M270A1 Launchers
  - LMVS Advance Work Authorization To Harris; 2 Prototypes In-House

SOLID STATE MASS STORAGE DEVISE IS PROVEN TECHNOLOGY

IFCS / ILMS HARDWARE DECISION

MLRS

SOFTWARE MATURITY AND MTBOMF

- Hardware Reliability Demonstrated
- Software Reliability Is Based On Hours Accumulated Only At ESIT
  - Software Reliability Is Low Due To Immaturity And High Churn Rate

	HW		*SW*	*Support**	*MTBOMF*
Failures	2	+	3 + ?		= 11.19
Collected Hours	3480		33.8 + 0 (ESIT Only)		

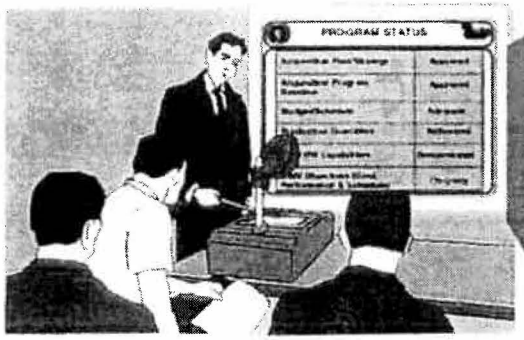
$$\frac{1}{\frac{1}{1740} + \frac{1}{11.7}} = 11.19$$

*Operator, Manuals, Maintenance, Installation, And Accident

IFCS / ILMS HARDWARE DECISION

MLRS

IFCS RECOMMENDATION



Overall Technical And Financial Risk Exposure Is Low For IFCS Kit Production

PROGRAM STATUS

MLRS

Acquisition Plan/Strategy	Approved
Acquisition Program Baseline	Approved
Budget/Schedule	Adequate
Production Quantities	Authorized
EMD HW Capabilities	Demonstrated
CAIV Objectives (Cost, Performance & Schedule)	On-going

RECOMMEND APPROVAL TO BEGIN FY98-99 MLRS IFCS KIT PRODUCTION

IFCS / ILMS HARDWARE DECISION

ILMS PROGRAM STATUS

- Performance Specification: EMD And Production
- Contract: Firm-Fixed Price (LMVS Letter Contract NTE In, Obligation Planned to A Definitized Contract)
- Exit Criteria: Demonstrated On EDT Hardware (All Exceeded Goal)
- Log/Maint Demonstration: IFCS/ILMS Preliminary Demonstration Completed Successfully (M270A1 Scheduled Oct 98)
- Firing: IFCS Only (M270A1 Firings Nov 98)
- EMI/INR Testing: LRU Level Complete For IFCS, ILMS IEDB In Test Now (M270A1 Scheduled Sep 98 - May 99)
- M270A1 Road Test: M993A1 EDT Completed (Scheduled Oct 98 - Feb 99)
- System Reliability: Data Collection Starts In Jun 98
- No External Assessments Planned/Expected By Sep 98
- Financial Risk Exposure Low

IFCS / ILMS HARDWARE DECISION

MLRS

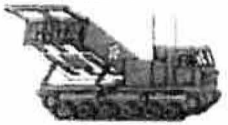
LMVS ILMS LRU QUAL STATUS (AS OF 26 MAY 98)

TEST	SWIVEL	HEAT EXCH	ADU	ELE TRANS	HYDR PUMP	HYDR MOTOR	HYDR RESER	LIU 3. LDS	BATT BOX/PSU
ATP	PASS	PASS	PASS		PASS	PASS	PASS	PASS	PASS
PERFORMANCE BASE LINE TEST	PASS	PASS			PASS	IN-TEST	IN-TEST	PASS	PASS
LOW TEMP FUNCTIONAL	PASS	PASS			PASS		IN-TEST	PASS	
HIGH TEMP FUNCTIONAL	PASS	PASS			PASS	PASS		PASS	
TEMP SHOCK	PASS	PASS						PASS	
SALT FOG	PASS	PASS							
SAND	PASS								
DUST	PASS								
TACTICAL VIB[2]	PASS	PASS	PASS		PASS	PASS	PASS	PASS	FAIL[4]
TACTICAL SHOCK[2]	PASS	PASS	PASS		PASS	PASS[1]	PASS	PASS[1]	IN-TEST[1]
ACCELERATION	PASS	PASS							
CLEANING SPRAY	PASS	PASS							
ENDURANCE	PASS								
SCHEDULED COMPLETION	Completed	Completed	15 Jul 98	15 Jul 98	15 Jul 98	15 Jul 98	15 Jul 98	Completed	6 June 98

1. RAIL SHOCK ALSO BEING PERFORMED
2. TESTS PERFORMED AT TEMP EXTREMES
3. EMI TEST PERFORMED AND SUCCESSFULLY COMPLETED
4. IMPROPER WELD – BACK IN TEST

PASSED
FAILED / UNDER ANALYSIS
IN - TEST
TESTS NOT REQUIRED

IFCS / ILMS HARDWARE DECISION

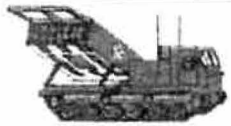


ILMS RISK AREA	COMMENT
Threat	MLRS threat has not diminished; ILMS requirement still valid.
Technology	Technology has been proven-out through years of research and application.
Hardware Design/Engineering	Required performance for majority of LRUs has been demonstrated through qualification testing. Minor hardware design changes with minor increases in complexity may be required to demonstrate compliance with performance requirements as qualification testing is completed.
Manufacturing	Manufacturing facilities/processes are being proven and qualified.
Support	ILMS design incorporates significantly enhanced reliability and maintainability features over the previous configuration. Increased reliability design features and overall reduction of system complexity should decrease the logistics burden. Logistics task development will continue through the M270A1 development phase.
Cost	Funding is adequate to support M270A1/ILMS Phase II ILMS Modification Kit Procurement. ILMS has a fixed price contract and nonrecurring cost on LRUs. Schedule integration with IFCS will preclude the need for dual funding teams and reduce installation costs.
Schedule	ILMS program re-baselining to Sep 99 does not affect FUE and allows for program maturation. The ILMS schedule is synchronized with IFCS. Contract will be aggressively managed under the IPT process.

Low Low-Moderate Moderate Moderate-High High

IFCS / ILMS HARDWARE DECISION

(Moderate.) Chart



ILMS HARDWARE / DESIGN MATURITY

ISSUE/MITIGATION

- **Azimuth/Elevation Hydraulic Motor** - Scheduled qualification testing is nearing completion.
- **Elevation Transmission** - Scheduled qualification testing has not been initiated. Component is currently completing EDT without difficulty.
- **ADU** - Unit is in the initial stages of qualification testing.
- **PTO/Clutch Coupling** - Coupling failure occurred during endurance testing. All other qualification testing has been successfully completed. Corrective actions have been initiated and endurance retesting is scheduled.
- **IEDB** - Unit requires dynamic qualification retest. Initial dynamic testing was improperly conducted. New vibration profiles are being developed for use in retest.
- **CENTRY Fuel Management System** - Item has successfully been qualified. Vendor control of design limits Government desired change. Alternatives exist but have not been selected.

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TAB 61

61A

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. Contract ID Code	Page 1 Of 3
Cost-Plus-Incentive-Fee	

2. Amendment/Modification No.	3. Effective Date	4. Requisition/Purchase Req No.	5. Project No. (If applicable)
P00113	26 OCT 1998	SEE SCHEDULE	

6. Issued By	Code	W31P4Q	7. Administered By (If other than Item 6)	Code	S4402A
US ARMY AVIATION & MISSILE COMMAND AMSAM-AC-TM-C MR JAMES COX (256) 876-8849 REDSTONE ARSENAL AL 35898-5280 EMAIL: JCOX@REDSTONE.ARMY.MIL WEAPON SYSTEM: MLRS			DCMC LOCKHEED MARTIN VOUGHT SYS P O BOX 650003 MT-03 DALLAS TX 75265-0003		

SCD C PAS NONE ADP PT SC1002

8. Name And Address Of Contractor (No., Street, City, County, State and Zip Code)		9A. Amendment Of Solicitation No.
LOCKHEED MARTIN VOUGHT SYSTEMS 1701 W MARSHALL DR GRAND PRAIRIE TX 75051-0000 TYPE BUSINESS: Large Business Performing in U.S.		9B. Dated (See Item 11)
	X	10A. Modification Of Contract/Order No. DAAH01-92-C-0432
		10B. Dated (See Item 13) 19920EP30
Code 64059	Facility Code	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers

☐ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing items 8 and 15, and returning _____ copies of the amendments: (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. Accounting And Appropriation Data (If required)
NO CHANGE TO OBLIGATION DATA

13. THIS ITEM ONLY APPLIES TO MODIFICATIONS OF CONTRACTS/ORDERS
It Modifies The Contract/Order No. As Described In Item 14.

MIND MOD CODE: C

☐	A. This Change Order is Issued Pursuant To: The Changes Set Forth In Item 14 Are Made In The Contract/Order No. In Item 10A.
☐	B. The Above Numbered Contract/Order Is Modified To Reflect The Administrative Changes (such as changes in paying office, appropriation data, etc.) Set Forth In Item 14, Pursuant To The Authority of FAR 43.103(b).
X	C. This Supplemental Agreement Is Entered Into Pursuant To Authority Of: MUTUAL AGREEMENT
☐	D. Other (Specify type of modification and authority)

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return _____ copies to the Issuing Office.

14. Description Of Amendment/Modification (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)
SEE SECOND PAGE FOR DESCRIPTION

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. Name And Title Of Signer (Type or print)	16A. Name And Title Of Contracting Officer (Type or print)
B. N. Smith Vice Pres. Bus. Operations	[redacted]
15B. Contractor/Offeror	15C. Date Signed
(Signature of person authorized to sign)	20 Oct 98
	(Signature of Contracting Officer)
	16C. Date Signed 26 OCT 1998

SECTION A - SUPPLEMENTAL INFORMATION

A-1 THE PURPOSE OF THIS MODIFICATION IS TO ESTABLISH A FUNDING CAP IN THE AMOUNT OF $152,427,775.00, FOR THE COMPLETION OF CONTRACT DAAH01-92-C-0432, MULTIPLE LAUNCH ROCKET SYSTEMS(MLRS) IMPROVED FIRE CONTROL SYSTEM (IFCS) REQUIREMENTS.

A-2 THE CONTRACTOR (LOCKHEED MARTIN VOUGHT SYSTEMS (LMVS)), HEREBY: AGREES TO COMPLETE THE REQUIREMENTS OF CONTRACT DAAH01-92-C-0432, AS PRESCRIBED IN ATTACHMENT 005, TO THIS MODIFICATION, TITLED "IFCS CONTRACT CLOSE OUT TASK", DATED OCTOBER 14, 1998.

1. THE CONTRACTOR AGREES TO ACCEPT THE FUNDED AMOUNT OF $152,427,775.00 AS TOTAL COMPENSATION FOR THE COMPLETION OF THE ABOVE REFERENCED WORK. THE PARTIES AGREE TO THE FOLLOWING DEFINITION FOR TOTAL COMPENSATION: TOTAL COMPENSATION INCLUDES ALL ALLOWABLE AND ALLOCABLE COST, FACILITIES CAPITAL COST OF MONEY, AND FEE, UP TO THE ESTABLISHED FUNDING CAP AMOUNT OF $152,427,775.00. THE CONTRACTS PERFORMANCE COMPLETION DATE IS NOVEMBER 30, 1998.

2. THE CONTRACTOR SHALL HAVE THE AUTHORITY TO SCHEDULE ALL REMAINING TASKS.

3. THE PARTIES HEREBY, AGREE TO INCORPORATE THE CONTRACTOR'S PLANNING SCHEDULE, DATED SEPTEMBER 16, 1998, WHICH IS ATTACHMENT 006 TO THIS MODIFICATION.

4. THE PARTIES AGREE THAT REMAINING CDRL SUBMITTALS SHALL BE THOSE THAT ARE DEPICTED ON ATTACHMENT 007, TO THIS MODIFICATION AND SHALL BE DELIVERED IN ACCORDANCE WITH THE DD1423'S AS MODIFIED BY ATTACHMENT 007.

5. IT IS THE MUTUAL UNDERSTANDING AND AGREEMENT OF THE PARTIES THAT ADDITIONAL WORK WHICH MIGHT BE ADDED, INCLUDING THE AT-2 FLIGHT TEST, IS NOT A PART OF THIS MODIFICATION'S REQUIREMENTS AND IS NOT INCLUDED IN THE COSTS COVERED BY THE FUNDING CAP REFERENCED ABOVE.

6. WHEREAS: CONTRACT MODIFICATION P00096, TERMINATED IN ITS ENTIRETY THE REQUIREMENT FOR METEOROLOGICAL SENSOR UNDER CLIN 003, OF THE IFCS CONTRACT DAAH01-92-C-0432, THE PARTIES UNDERSTAND AND AGREE THAT SETTLEMENT TERMS AND CONDITIONS SHALL BE IN ACCORDANCE WITH FEDERAL ACQUISITION REGULATION 52.249-6, AND WILL REQUIRE A SEPARATE CONTRACT MODIFICATION TO ADJUST THE FUNDING CAP.

7. THE PARTIES HEREBY, AGREE TO REDUCE THE MINIMUM FEE FROM 4.5% TO A MINIMUM FEE OF 2.75%. THE PARTIES AGREE THAT THE EXISTING SHARE RATIO REMAINS UNCHANGED EXCEPT THAT THE SHARE RATIO FOR OVERRUNS BEYOND 4.5% FEE IS 0/100 (GOVERNMENT/CONTRACTOR). THE GOVERNMENT DOES NOT INTEND TO SHARE IN THE $2,100,000.00, WHICH WAS THE TOTAL DOLLARS MADE AVAILABLE BY THE REDUCTION IN MINIMUM FEE FROM 4.5% TO 2.75%.

A-3 THIS MODIFICATION CONSTITUTES FULL AND FINAL SETTLEMENT FOR ALL THE CONTRACTUAL CHANGES OF THIS MODIFICATION. THE PARTIES HEREBY MUTUALLY RELEASE EACH OTHER FROM ANY AND ALL LIABILITY UNDER THIS CONTRACT FOR FURTHER EQUITABLE ADJUSTMENTS ATTRIBUTED TO SUCH FACTS AND CIRCUMSTANCES GIVING RISE TO THESE CHANGES.

*** END OF NARRATIVE A070 ***

SECTION J - LIST OF ATTACHMENTS

List of Addenda	Title	Date	Number of Pages	Transmitted By
Attachment 005	IFCS CONTRACT CLOSE OUT TASK	13-OCT-98	005	
Attachment 006	REMAINING IFCS EFFORT	16-SEP-98	001	
Attachment 007	IFCS CONTRACT CLOSEOUT CDRLS	01-OCT-98	001	

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IFCS Contract Closeout Tasks

1. Introduction

2. Technical Requirements

2.1 Software Development

2.1.1 Complete Version Alpha of the Improved Fire Control System (IFCS) Software.

2.1.1.1 This task includes updating the Maintenance Manager (MM) CSCI, Man Machine Interface (MMI) CSCI, and Operating System software and support of their integration into the IFCS Launcher. Task completion is defined as that software functionality that is available to support a September 28, 1998 drop. Test anomalies will be documented in STRs.

2.1.2 Complete IFCS CSCIs and FQTs.

2.1.2.1 This task includes the development and regression Formal Qualification Test (FQT) of the Weapon Interface Manager (WIM) for the AT2. Task completion for development is defined as the completion of engineering tests. Task completion for the regression FQT will be defined as the completion of the regression FQT.

2.1.2.2 This task includes the development and FQT of the TACMS Block IA Weapon Manager (TACIAMAN). Task completion for development is defined as the completion of engineering tests. Task completion for the FQT is defined as the completion of the FQT. Test anomalies will be documented in STRs.

2.1.2.3 This task includes the development and FQT of the TACMS Block IA Ballistics Manager (TACIABAM). Task completion for development is defined as the completion of engineering tests. Task completion for the FQT is defined as the completion of the FQT. Test anomalies will be documented in STRs.

2.1.3 Support FCA/PCA

2.1.3.1 This task includes the completion of the functional configuration audit (FCA) and the physical configuration audit (PCA) for the WIM, AT2 Weapon Manager, TACMS Block IA Weapon Manager, and TACMS Block IA Ballistics Manager. Task completion is defined as the completion of the FCA/PCA for each CSCI.

2.1.4 Software Management

2.1.4.1 This task includes the management of the software activities.

2.1.5 Support to System Integration Test (SIT)

2.1.5.1 This task includes providing software expertise during the conduct of SIT procedures. Completion is defined as the completion of SIT.

2.1.6 Software Quality Assurance (SQA) Activities

2.1.6.1 This task includes SQA's activities to support software development. Task completion is defined as completion of the FCA/PCA.

2.1.7 Software Configuration Management (CM) Activities

2.1.7.1 This task includes Software CM's activities to support software development. Task completion is defined as completion of the FCA/PCA.

2.2 Off-Launcher Test Set (OTS) Hardware and Software Development

2.2.1 This task includes completing the software integration between the OTS and the Weapon Interface Unit (WIU) and between the OTS and the Launcher Interface Unit (LIU). Task completion is defined as completion of engineering tests.

2.2.2 This task includes exercising the OTS as required to support the Maintainability Demonstration. Task completion is defined as the completion of the Maintainability Demonstration.

2.3 Progam Load Unit (PLU) Software Development

2.3.1 This task includes completing integration between the PLU and the launcher and between the PLU and the console. Task completion is defined as the completion of engineering compatibility tests.

2.3.2 This task includes the conduct of a PLU software FQT on the launcher. Task completion is defined as the completion of the FQT. Test anomalies will be documented in STRs.

2.3.3 This task includes the conduct of the PCA and FCA. Task completion is defined as the completion of the PCA and FCA.

2.4 Lab Support (Instrumentation)

2.4.1 This task provides instrumentation expertise for testing on the launcher. Test data will be processed and provided as needed, logged, and archived.

2.5 Interactive Electronic Technical Manual (IETM) Validation

2.5.1 This task includes completing the IETM development. This task is complete.

2.5.2 This task includes validating the IETM against the Version Alpha drop. Task completion is defined as completion of Logistics testing.

2.5.3 This task includes managing the Logistics effort.

2.5.4 This task includes the final IETM update. Task completion is defined as completion of the IETM.

2.6 Technical Specialist Course Preparation

2.6.1 This task includes the preparation of the course material to describe the Version Alpha drop. Task completion is defined as the completion of the training materials.

2.7 Complete SIT Procedures

2.7.1 This task includes the execution of the remaining seven SIT Procedures. Any software problems will be documented with STRs.

2.7.2 This task includes writing the SIT Report. Task completion is defined as the release of the report.

2.7.3 This task includes managing, coordinating, and providing status for the IFCS Integration Team.

2.8 Maintainability Demonstration

2.8.1 This task includes completing the maintainability checkout for Version Alpha.

2.8.2 This task includes completing the Maintainability Demonstration. Task completion is defined as the completion of the Maintainability Demonstration. Any software problems will be documented on STRs.

2.8.2.1 This task includes providing software support to correct software problems found during the Maintainability Demonstration. Task completion is defined as the completion of the Maintainability Demonstration.

2.8.3 This task includes completing the Maintainability Demonstration Report. Task completion is defined as release of the report.

2.8.4 This task includes providing lab support for the Maintainability Demonstration.

2.9 AT2 Qualification

2.9.1 This task includes coordinating the environmental qualification test planning with Redstone Arsenal. Task completion is defined as the start of the test.

2.9.2 This task includes coordinating the electromagnetic interference (EMI) test planning with Harris. Task completion is defined as the start of the test.

2.9.3 This task includes monitoring the EMI test and the environmental qualification test. Task completion is defined as the completion of qualification effort.

2.9.4 This task includes lab support for software testing. Task completion is defined as the completion of testing.

2.9.5 This task includes controlling the drawing release of the modified technical data package (TDP). Task completion is defined as the release of the drawings.

2.9.6 This task includes the coordination and conduct of the delta FCA. Task completion is defined as completion of the FCA and the update and ERR of the specifications.

2.9.7 This task includes supporting the FCA. Task completion is defined as FCA completion.

2.9.8 This task includes the preparation and release of the ERR for the B2 Specification and the Interface Control Document for the AT2 card. Task completion is defined as the release of the ERR.

2.9.9 This task includes writing procedures, running the AT2 SIT, and writing a test report. Task completion is defined as starting the test, completing the test, and releasing the test report.

2.9.10 This task includes the delivery of the hardware by Harris. Task completion is defined as the delivery of the hardware.

2.10 Program Management

2.10.1 This task includes management and status reports.

2.10.2 This task includes an IFCS Time Ordered Events List (TOEL) record run that will be exercised in November 1998 to benchmark performance. Soldier involvement will be requested. Task completion will be defined as completion of the exercise.

2.10.3 Configuration Management

2.10.3.1 This task includes preparing and releasing the PNU ICD ECP. Task completion is defined as releasing the ECP.

2.10.3.2 This task includes preparing and releasing the FCP, LIU, PSU, and WIU ICD ECP. Task completion is defined as releasing the ECP.

2.10.3.3 This task includes finalizing and releasing the ERR for the TDP. Task completion is defined as releasing the ERR for the AT2.

3. Tasks Not Completed Under IFCS

ATTACHMENT 005

Tasks which will not be completed under the IFCS Contract include:

a. Corrective action related to anomalies documented in STRs.
b. Action Items resulting from the closeout activities.
c. Any tasks not identified in this Contract Closeout Task description.

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TAB 62

(1) Unless a special situation exists, the Government shall inspect contracts at or below the simplified acquisition threshold at destination and only for type and kind; quantity; damage; operability (if readily determinable); and preservation, packaging, packing, and marking, if applicable.

(2) Special situations may require more detailed quality assurance and the use of a standard inspection or higher-level contract quality requirement. These situations include those listed in 46.402 and contracts for items having critical applications.

(3) Detailed Government inspection may be limited to those characteristics that are special or likely to cause harm to personnel or property. When repetitive purchases of the same item are made from the same manufacturer with a history of defect-free work, Government inspection may be reduced to a periodic check of occasional purchases.

46.405 Subcontracts.

(a) Government contract quality assurance on subcontracted supplies or services shall be performed only when required in the Government's interest. The primary purpose is to assist the contract administration office cognizant of the prime contractor's plant in determining the conformance of subcontracted supplies or services with contract requirements or to satisfy one or more of the factors included in (b) of this section. It does not relieve the prime contractor of any responsibilities under the contract. When appropriate, the prime contractor shall be requested to arrange for timely Government access to the subcontractor facility.

(b) The Government shall perform quality assurance at the subcontract level when—

(1) The item is to be shipped from the subcontractor's plant to the using activity and inspection at source is required;

(2) The conditions for quality assurance at source are applicable (see 46.402);

(3) The contract specifies that certain quality assurance functions, which can be performed only at the subcontractor's plant, are to be performed by the Government; or

(4) It is otherwise required by the contract or determined to be in the Government's interest.

(c) Supplies or services for which certificates, records, reports, or similar evidence of quality are available at the prime contractor's plant shall not be inspected at the subcontractor's plant, except occasionally to verify this evidence or when required under (b) of this section.

(d) All oral and written statements and contract terms and conditions relating to Government quality assurance actions at the subcontract level shall be worded so as not to—

(1) Affect the contractual relationship between the prime contractor and the Government, or between the prime contractor and the subcontractor;

(2) Establish a contractual relationship between the Government and the subcontractor; or

(3) Constitute a waiver of the Government's right to accept or reject the supplies or services.

46.406 Foreign governments.

Government contract quality assurance performed for foreign governments or international agencies shall be administered according to the foreign policy and security objectives of the United States. Such support shall be furnished only when consistent with or required by legislation, executive orders, or agency policies concerning mutual international programs.

46.407 Nonconforming supplies or services.

(a) The contracting officer should reject supplies or services not conforming in all respects to contract requirements (see 46.102). In those instances where deviation from this policy is found to be in the Government's interest, such supplies or services may be accepted only as authorized in this section.

(b) The contracting officer ordinarily must give the contractor an opportunity to correct or replace nonconforming supplies or services when this can be accomplished within the required delivery schedule. Unless the contract specifies otherwise (as may be the case in some cost-reimbursement contracts), correction or replacement must without additional cost to the Government. Paragraph (e)(2) of the clause at 52.246-2, Inspection of Supplies—Fixed-Price, reserves to the Government the right to charge the contractor the cost of Government reinspection and retests because of prior rejection.

(c)(1) In situations not covered by paragraph (b) of this section, the contracting officer ordinarily must reject supplies or services when the nonconformance is critical or major or the supplies or services are otherwise incomplete. However, there may be circumstances (*e.g.*, reasons of economy or urgency) when the contracting officer determines acceptance or conditional acceptance of supplies or services is in the best interest of the Government. The contracting officer must make this determination based upon—

(i) Advice of the technical activity that the item is safe to use and will perform its intended purpose;

(ii) Information regarding the nature and extent of the nonconformance or otherwise incomplete supplies or services;

(iii) A request from the contractor for acceptance of the nonconforming or otherwise incomplete supplies or services (if feasible);

(iv) A recommendation for acceptance, conditional acceptance, or rejection, with supporting rationale; and

(v) The contract adjustment considered appropriate, including any adjustment offered by the contractor.

(2) The cognizant contract administration office, or other Government activity directly involved, must furnish this data to the contracting officer in writing, except that in urgent cases it may be furnished orally and later confirmed in

writing. Before making a decision to accept, the contracting officer must obtain the concurrence of the activity responsible for the technical requirements of the contract and, where health factors are involved, of the responsible health official of the agency concerned.

(d) If the nonconformance is minor, the cognizant contract administration office may make the determination to accept or reject, except where this authority is withheld by the contracting office of the contracting activity. To assist in making this determination, the contract administration office may establish a joint contractor-contract administrative office review group. Acceptance of supplies and services with critical or major nonconformances is outside the scope of the review group.

(e) The contracting officer must discourage the repeated tender of nonconforming supplies or services, including those with only minor nonconformances, by appropriate action, such as rejection and documenting the contractor's performance record.

(f) When supplies or services are accepted with critical or major nonconformances as authorized in paragraph (c) of this section, the contracting officer must modify the contract to provide for an equitable price reduction or other consideration. In the case of conditional acceptance, amounts withheld from payments generally should be at least sufficient to cover the estimated cost and related profit to correct deficiencies and complete unfinished work. The contracting officer must document in the contract file the basis for the amounts withheld. For services, the contracting officer can consider identifying the value of the individual work requirements or tasks (subdivisions) that may be subject to price or fee reduction. This value may be used to determine an equitable adjustment for nonconforming services. However, when supplies or services involving minor nonconformances are accepted, the contract need not be modified unless it appears that the savings to the contractor in fabricating the nonconforming supplies or performing the nonconforming services will exceed the cost to the Government of processing the modification.

(g) Notices of rejection must include the reasons for rejection and be furnished promptly to the contractor. Promptness in giving this notice is essential because, if timely nature of rejection is not furnished, acceptance may in certain cases be implied as a matter of law. The notice must be in writing if—

(1) The supplies or services have been rejected at a place other than the contractor's plant;

(2) The contractor persists in offering nonconforming supplies or services for acceptance; or

(3) Delivery or performance was late without excusable cause.

46.408 Single-agency assignments of Government contract quality assurance.

(a) Government-wide responsibility for quality assurance support for acquisitions of certain commodities is assigned as follows:

(1) For drugs, biologics, and other medical supplies—the Food and Drug Administration;

(2) For food, except seafood—the Department of Agriculture.

(3) For seafood—the National Marine Fisheries Service of the Department of Commerce.

(b) Agencies requiring quality assurance support for acquiring these supplies should request the support directly from the cognizant office.

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TAB 63

Subpart 46.5—Acceptance

46.501 General.

Acceptance constitutes acknowledgment that the supplies or services conform with applicable contract quality and quantity requirements, except as provided in this subpart and subject to other terms and conditions of the contract. Acceptance may take place before delivery, at the time of delivery, or after delivery, depending on the provisions of the terms and conditions of the contract. Supplies or services shall ordinarily not be accepted before completion of Government contract quality assurance actions (however, see 46.504). Acceptance shall ordinarily be evidenced by execution of an acceptance certificate on an inspection or receiving report form or commercial shipping document/packing list.

46.502 Responsibility for acceptance.

Acceptance of supplies or services is the responsibility of the contracting officer. When this responsibility is assigned to a cognizant contract administration office or to another agency (see 42.202(g)), acceptance by that office or agency is binding on the Government.

46.503 Place of acceptance.

Each contract shall specify the place of acceptance. Contracts that provide for Government contract quality assurance at source shall ordinarily provide for acceptance at source. Contracts that provide for Government contract quality assurance at destination shall ordinarily provide for acceptance at destination. (For transportation terms, see Subpart 47.3.) Supplies accepted at a place other than destination shall not be reinspected at destination for acceptance purposes, but should be examined at destination for quantity, damage in transit, and possible substitution or fraud.

46.504 Certificate of conformance.

A certificate of conformance (see 46.315) may be used in certain instances instead of source inspection (whether the contract calls for acceptance at source or destination) at the discretion of the contracting officer if the following conditions apply:

(a) Acceptance on the basis of a contractor's certificate of conformance is in the Government's interest.

(b)(1) Small losses would be incurred in the event of a defect; or

(2) Because of the contractor's reputation or past performance, it is likely that the supplies or services furnished will be acceptable and any defective work would be replaced, corrected, or repaired without contest. In no case shall the Government's right to inspect supplies under the inspection provisions of the contract be prejudiced.

46.505 Transfer of title and risk of loss.

(a) Title to supplies shall pass to the Government upon formal acceptance, regardless of when or where the Government takes physical possession, unless the contract specifically provides for earlier passage of title.

(b) Unless the contract specifically provides otherwise, risk of loss of or damage to supplies shall remain with the contractor until, and shall pass to the Government upon—

(1) Delivery of the supplies to a carrier if transportation is f.o.b. origin; or

(2) Acceptance by the Government or delivery of the supplies to the Government at the destination specified in the contract, whichever is later, if transportation is f.o.b. destination.

(c) Paragraph (b) of this section shall not apply to supplies that so fail to conform to contract requirements as to give a right of rejection. The risk of loss of or damage to such nonconforming supplies remains with the contractor until cure or acceptance. After cure or acceptance, paragraph (b) of this section shall apply.

(d) Under paragraph (b) of this section, the contractor shall not be liable for loss of or damage to supplies caused by the negligence of officers, agents, or employees of the Government acting within the scope of their employment.

(e) The policy expressed in (a) through (d) of this section is specified in the clause at 52.246-16, Responsibility for Supplies, which is prescribed in 46.316.

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TAB 64

NOT MEASUREMENT SENSITIVE

MIL-STD-882D
10 February 2000

SUPERSEDING
MIL-STD-882C
19 January 1993

DEPARTMENT OF DEFENSE

STANDARD PRACTICE FOR SYSTEM SAFETY

AMSC N/A

AREA SAFT

FOREWORD

1. This standard is approved for use by all Departments and Agencies within the Department of Defense (DoD).

2. The DoD is committed to protecting: private and public personnel from accidental death, injury, or occupational illness; weapon systems, equipment, material, and facilities from accidental destruction or damage; and public property while executing its mission of national defense. Within mission requirements, the DoD will also ensure that the quality of the environment is protected to the maximum extent practical. The DoD has implemented environmental, safety, and health efforts to meet these objectives. Integral to these efforts is the use of a system safety approach to manage the risk of mishaps associated with DoD operations. A key objective of the DoD system safety approach is to include mishap risk management consistent with mission requirements, in technology development by design for DoD systems, subsystems, equipment, facilities, and their interfaces and operation. The DoD goal is zero mishaps.

3. This standard practice addresses an approach (a standard practice normally identified as system safety) useful in the management of environmental, safety, and health mishap risks encountered in the development, test, production, use, and disposal of DoD systems, subsystems, equipment, and facilities. The approach described herein conforms to the acquisition procedures in DoD Regulation 5000.2-R and provides a consistent means of evaluating identified mishap risks. Mishap risk must be identified, evaluated, and mitigated to a level acceptable (as defined by the system user or customer) to the appropriate authority, and compliant with federal laws and regulations, Executive Orders, treaties, and agreements. Program trade studies associated with mitigating mishap risk must consider total life cycle cost in any decision. Residual mishap risk associated with an individual system must be reported to and accepted by the appropriate authority as defined in DoD Regulation 5000.2-R. When MIL-STD-882 is required in a solicitation or contract and no specific references are included, then only those requirements presented in section 4 are applicable.

4. This revision applies the tenets of acquisition reform to system safety in Government procurement. A joint Government/Industrial process team oversaw this revision. The Government Electronic and Information Technology Association (GEIA), G-48 committee on system safety represented industry on the process action team. System safety information (e.g., system safety tasks, commonly used approaches, etc.) associated with previous versions of this standard are in the *Defense Acquisition Deskbook* (see 6.8). This standard practice is no longer the source for any safety-related data item descriptions (DIDs).

5. Address beneficial comments (recommendations, additions, and deletions) and any pertinent information that may be of use in improving this document to: HQ Air Force Materiel Command (SES), 4375 Chidlaw Road, Wright-Patterson AFB, OH 45433-5006. Use the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter or electronic mail.

CONTENTS

TABLES

1. SCOPE

1.1 Scope. This document outlines a standard practice for conducting system safety.

The system safety practice as defined herein conforms to the acquisition procedures in DoD Regulation 5000.2-R and provides a consistent means of evaluating identified risks. Mishap risk must be identified, evaluated, and mitigated to a level acceptable (as defined by the system user or customer) to the appropriate authority and compliant with federal (and state where applicable) laws and regulations, Executive Orders, treaties, and agreements. Program trade studies associated with mitigating mishap risk must consider total life cycle cost in any decision. When requiring MIL-STD-882 in a solicitation or contract and no specific paragraphs of this standard are identified, then apply only those requirements presented in section 4.

2. APPLICABLE DOCUMENTS

Sections 3, 4, and 5 of this standard contain no applicable documents. This section does not include documents cited in other sections of this standard or recommended for additional information or as examples.

3. DEFINITIONS

3.1 Acronyms used in this standard. The acronyms used in this standard are defined as follows:

a.	AMSDL	Acquisition Management System & Data Requirement List
b.	ANSI	American National Standard Institute
c.	DID	Data Item Description
d.	DoD	Department of Defense
e.	ESH	Environmental, Safety, and Health
f.	GEIA	Government Electronic & Information Technology Association
g.	MAIS	Major Automated Information System
h.	MDAP	Major Defense Acquisition Program
i.	USAF	United States Air Force

3.2 Definitions. Within this document, the following definitions apply (see 6.4):

3.2.1 Acquisition program. A directed, funded effort designed to provide a new, improved, or continuing system in response to a validated operational need.

3.2.2 Developer. The individual or organization assigned responsibility for a development effort. Developers can be either internal to the government or contractors.

3.2.3 Hazard. Any real or potential condition that can cause injury, illness, or death to personnel; damage to or loss of a system, equipment or property; or damage to the environment.

3.2.4 Hazardous material. Any substance that, due to its chemical, physical, or biological nature, causes safety, public health, or environmental concerns that would require an elevated level of effort to manage.

3.2.5 Life cycle. All phases of the system's life including design, research, development, test and evaluation, production, deployment (inventory), operations and support, and disposal.

3.2.6 Mishap. An unplanned event or series of events resulting in death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.

3.2.7 Mishap risk. An expression of the impact and possibility of a mishap in terms of potential mishap severity and probability of occurrence.

3.2.8 Program Manager (PM). A government official who is responsible for managing an acquisition program. Also, a general term of reference to those organizations directed by individual managers, exercising authority over the planning, direction, and control of tasks and associated functions essential for support of designated systems. This term will normally be used in lieu of any other titles, e.g.; system support manager, weapon program manager, system manager, and project manager.

3.2.9 Residual mishap risk. The remaining mishap risk that exists after all mitigation techniques have been implemented or exhausted, in accordance with the system safety design order of precedence (see 4.4).

3.2.10 Safety. Freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.

3.2.11 Subsystem. A grouping of items satisfying a logical group of functions within a particular system.

3.2.12 System. An integrated composite of people, products, and processes that provide a capability to satisfy a stated need or objective.

3.2.13 System safety. The application of engineering and management principles, criteria, and techniques to achieve acceptable mishap risk, within the constraints of operational effectiveness and suitability, time, and cost, throughout all phases of the system life cycle.

3.2.14 System safety engineering. An engineering discipline that employs specialized professional knowledge and skills in applying scientific and engineering principles, criteria, and techniques to identify and eliminate hazards, in order to reduce the associated mishap risk.

4. GENERAL REQUIREMENTS

This section defines the system safety requirements to perform throughout the life cycle for any system, new development, upgrade, modification, resolution of deficiencies, or technology development. When properly applied, these requirements should ensure the identification and understanding of all known hazards and their associated risks; and mishap risk eliminated or reduced to acceptable levels. The objective of system safety is to achieve acceptable mishap risk through a systematic approach of hazard analysis, risk assessment, and risk management. This document delineates the minimum mandatory requirements for an acceptable system safety program for any DoD system. When MIL-STD-882 is required in a solicitation or contract, but no specific references are included, then only the requirements in this section are applicable. System safety requirements consist of the following:

4.1 Documentation of the system safety approach. Document the developer's and program manager's approved system safety engineering approach. This documentation shall:

a. Describe the program's implementation using the requirements herein. Include identification of each hazard analysis and mishap risk assessment process used.

b. Include information on system safety integration into the overall program structure.

c. Define how hazards and residual mishap risk are communicated to and accepted by the appropriate risk acceptance authority (see 4.7) and how hazards and residual mishap risk will be tracked (see 4.8).

4.2 Identification of hazards. Identify hazards through a systematic hazard analysis process encompassing detailed analysis of system hardware and software, the environment (in which the system will exist), and the intended use or application. Consider and use historical hazard and mishap data, including lessons learned from other systems. Identification of hazards is a responsibility of all program members. During hazard identification, consider hazards that could occur over the system life cycle.

4.3 Assessment of mishap risk. Assess the severity and probability of the mishap risk associated with each identified hazard, i.e., determine the potential negative impact of the hazard on personnel, facilities, equipment, operations, the public, and the environment, as well as on the system itself. The tables in Appendix A are to be used unless otherwise specified.

4.4 Identification of mishap risk mitigation measures. Identify potential mishap risk mitigation alternatives and the expected effectiveness of each alternative or method. Mishap risk mitigation is an iterative process that culminates when the residual mishap risk has been reduced to a level acceptable to the appropriate authority. The system safety design order of precedence for mitigating identified hazards is:

a. Eliminate hazards through design selection. If unable to eliminate an identified hazard, reduce the associated mishap risk to an acceptable level through design selection.

b. Incorporate safety devices. If unable to eliminate the hazard through design selection, reduce the mishap risk to an acceptable level using protective safety features or devices.

c. Provide warning devices. If safety devices do not adequately lower the mishap risk of the hazard, include a detection and warning system to alert personnel to the particular hazard.

d. Develop procedures and training. Where it is impractical to eliminate hazards through design selection or to reduce the associated risk to an acceptable level with safety and warning devices, incorporate special procedures and training. Procedures may include the use of personal protective equipment. For hazards assigned Catastrophic or Critical mishap severity categories, avoid using warning, caution, or other written advisory as the only risk reduction method.

4.5 Reduction of mishap risk to an acceptable level. Reduce the mishap risk through a mitigation approach mutually agreed to by both the developer and the program manager. Communicate residual mishap risk and hazards to the associated test effort for verification.

4.6 Verification of mishap risk reduction. Verify the mishap risk reduction and mitigation through appropriate analysis, testing, or inspection. Document the determined residual mishap risk. Report all new hazards identified during testing to the program manager and the developer.

4.7 Review of hazards and acceptance of residual mishap risk by the appropriate authority. Notify the program manager of identified hazards and residual mishap risk. Unless otherwise specified, the suggested tables A-I through A-III of the appendix will be used to rank residual risk. The program manager shall ensure that remaining hazards and residual mishap risk are reviewed and accepted by the appropriate risk acceptance authority (ref. table A-IV). The appropriate risk acceptance authority will include the system user in the mishap risk review. The appropriate risk acceptance authority shall formally acknowledge and document acceptance of hazards and residual mishap risk.

4.8 Tracking of hazards, their closures, and residual mishap risk. Track hazards, their closure actions, and the residual mishap risk. Maintain a tracking system that includes hazards, their closure actions, and residual mishap risk throughout the system life cycle. The program manager shall keep the system user advised of the hazards and residual mishap risk.

5. DETAILED REQUIREMENTS

Program managers shall identify in the solicitation and system specification any specific system safety engineering requirements including risk assessment and acceptance, unique classifications and certifications (see 6.6 and 6.7), or any mishap reduction needs unique to their program. Additional information in developing program specific requirements is located in Appendix A.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. This standard establishes a common basis for expectations of a properly executed system safety effort.

6.2 Data requirements. Hazard analysis data may be obtained from contracted sources by citing DI-MISC-80508, Technical Report - Study/Services. When it is necessary to obtain data, list the applicable Data Item Descriptions (DIDs) on the Contract Data Requirements List (DD Form 1423), except where the DoD Federal Acquisition Regulation Supplement exempts the requirement for a DD Form 1423. The developer and the program manager are encouraged to negotiate access to internal development data when hard copies are not necessary. They are also encouraged to request that any type of safety plan required to be provided by the contractor, be submitted with the proposal. It is further requested that any of the below listed data items be condensed into the statement of work and the resulting data delivered in one general type scientific report.

Current DIDs, that may be applicable to a system safety effort (check DoD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL) for the most current version before using), include:

DID Number	DID Title
DI-MISC-80043	Ammunition Data Card
DI-SAFT-80101	System Safety Hazard Analysis Report
DI-SAFT-80102	Safety Assessment Report
DI-SAFT-80103	Engineering Change Proposal System Safety Report
DI-SAFT-80104	Waiver or Deviation System Safety Report
DI-SAFT-80105	System Safety Program Progress Report
DI-SAFT-80106	Occupational Health Hazard Assessment
DI-SAFT-80184	Radiation Hazard Control Procedures
DI-MISC-80508	Technical Report - Study Services
DI SAFT-80931	Explosive Ordnance Disposal Data
DI-SAFT-81065	Safety Studies Report
DI-SAFT-81066	Safety Studies Plan
DI-ADMN-81250	Conference Minutes
DI-SAFT-81299	Explosive Hazard Classification Data
DI-SAFT-81300	Mishap Risk Assessment Report
DI-ILSS-81495	Failure Mode, Effects, Criticality Analysis Report

6.3 Subject term (key word) listing.

Environmental
Hazard
Mishap
Mishap probability levels
Mishap risk
Mishap severity categories
Occupational Health
Residual mishap risk
System safety engineering

6.4 Definitions used in this standard. The definitions at 3.2 may be different from those used in other specialty areas. One must carefully check the specific definition of a term in question for its area of origination before applying the approach described in this document.

6.5 International standardization agreements. Certain provisions of this standard are the subject of international standardization agreements (AIR STD 20/23B, *Safety Design Requirements for Airborne Dispenser Weapons*, and STANAG No. 3786, *Safety Design Requirements for Airborne Dispenser Weapons*). When proposing amendment, revision, or cancellation of this standard that might modify the international agreement concerned, the preparing activity will take appropriate action through international standardization channels, including departmental standardization offices, to change the agreement or make other appropriate accommodations.

6.6 Explosive hazard classification and characteristic data. Any new or modified item of munitions or of an explosive nature that will be transported to or stored at a DoD installation or facility must first obtain an interim or final explosive hazard classification. The system safety effort should provide the data necessary for the program manager to obtain the necessary classification(s). These data should include identification of safety hazards involved in handling, shipping, and storage related to production, use, and disposal of the item.

6.7 Use of system safety data in certification and other specialized safety approvals. Hazard analyses are often required for many related certifications and specialized reviews. Examples of activities requiring data generated during a system safety effort include:

a. Federal Aviation Agency airworthiness certification of designs and modifications
b. DoD airworthiness determination
c. Nuclear and non-nuclear munitions certification
d. Flight readiness reviews
e. Flight test safety review board reviews
f. Nuclear Regulatory Commission licensing
g. Department of Energy certification

Special safety-related approval authorities include USAF Radioisotope Committee, Weapon System Explosive Safety Review Board (Navy), Non-Nuclear Weapons and Explosives Safety Board (NNWESB), Army Fuze Safety Review Board, Triservice Laser Safety Review

Board, and the DoD Explosive Safety Board. Acquisition agencies should ensure that appropriate service safety agency approvals are obtained prior to use of new or modified weapons systems in an operational or test environment.

6.8 DoD acquisition practices. Information on DoD acquisition practices is presented in the *Defense Acquisition Deskbook* available from the Deskbook Joint Program Office, Wright-Patterson Air Force Base, Ohio. Nothing in the referenced information is considered additive to the requirements provided in this standard.

6.9 Identification of changes. Due to the extent of the changes, marginal notations are not used in this revision to identify changes with respect to the previous issue.

GUIDANCE FOR IMPLEMENTATION OF A SYSTEM SAFETY EFFORT

A.1 SCOPE

A.1.1 Scope. This appendix provides rationale and guidance to fit the needs of most system safety efforts. It includes further explanation of the effort and activities available to meet the requirements described in section 4 of this standard. This appendix is not a mandatory part of this standard and is not to be included in solicitations by reference. However, program managers may extract portions of this appendix for inclusion in requirement documents and solicitations.

A.2 APPLICABLE DOCUMENTS

A.2.1 General. The documents listed in this section are referenced in sections A.3, A.4, and A.5. This section does not include documents cited in other sections of this appendix or recommended for additional information or as examples.

A.2.2 Government documents.

A.2.2.1 Specifications, standards, and handbooks. This section is not applicable to this appendix.

A.2.2.2 Other Government documents, drawings, and publications. The following other Government document forms a part of this document to the extent specified herein. Unless otherwise specified, the issue is that cited in the solicitation.

DoD 5000.2-R	Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs

(Copies of DoD 5000.2-R are available from the Washington Headquarters Services, Directives and Records Branch (Directives Section), Washington, DC or from the DoD Acquisition Deskbook).

A.2.3 Non-Government publications. This section is not applicable to this appendix.

A.2.4 Order of precedence. Since this appendix is not mandatory, in event of a conflict between the text of this appendix and the reference cited herein, the text of the reference takes precedence. Nothing in this appendix supersedes applicable laws and regulations unless a specific exemption has been obtained.

A.3 DEFINITIONS

A.3.1 Acronyms used in this appendix. No additional acronyms are used in this appendix.

A.3.2 Definitions. Additional definitions that apply to this appendix:

A.3.2.1 Development agreement. The formal documentation of the agreed-upon tasks that the developer will execute for the program manager. For a commercial developer, this agreement usually is in the form of a written contract.

A.3.2.2 Fail-safe. A design feature that ensures the system remains safe, or in the event of a failure, causes the system to revert to a state that will not cause a mishap.

A.3.2.3 Health hazard assessment. The application of biomedical knowledge and principles to identify and eliminate or control health hazards associated with systems in direct support of the life-cycle management of materiel items.

A.3.2.4 Mishap probability. The aggregate probability of occurrence of the individual events/hazards that might create a specific mishap.

A.3.2.5 Mishap probability levels. An arbitrary categorization that provides a qualitative measure of the most reasonable likelihood of occurrence of a mishap resulting from personnel error, environmental conditions, design inadequacies, procedural deficiencies, or system, subsystem, or component failure or malfunction.

A.3.2.6 Mishap risk assessment. The process of characterizing hazards within risk areas and critical technical processes, analyzing them for their potential mishap severity and probabilities of occurrence, and prioritizing them for risk mitigation actions.

A.3.2.7 Mishap risk categories. An arbitrary categorization of mishap risk assessment values often used to generate specific action such as mandatory reporting of certain hazards to management for action, or formal acceptance of the associated mishap risk.

A.3.2.8 Mishap severity. An assessment of the consequences of the most reasonable credible mishap that could be caused by a specific hazard.

A.3.2.9 Mishap severity category. An arbitrary categorization that provides a qualitative measure of the most reasonable credible mishap resulting from personnel error, environmental conditions, design inadequacies, procedural deficiencies, or system, subsystem, or component failure or malfunction.

A.3.2.10 Safety critical. A term applied to any condition, event, operation, process, or item whose proper recognition, control, performance, or tolerance is essential to safe system operation and support (e.g., safety critical function, safety critical path, or safety critical component).

A.3.2.11 System safety management. All plans and actions taken to identify, assess, mitigate, and continuously track, control, and document environmental, safety, and health mishap risks encountered in the development, test, acquisition, use, and disposal of DoD weapon systems, subsystems, equipment, and facilities.

A.4 GENERAL REQUIREMENTS

A.4.1 General. System safety applies engineering and management principles, criteria, and techniques to achieve acceptable mishap risk, within the constraints of operational effectiveness, time, and cost, throughout all phases of the system life cycle. It draws upon professional knowledge and specialized skills in the mathematical, physical, and scientific disciplines, together with the principles and methods of engineering design and analysis, to specify and evaluate the environmental, safety, and health mishap risk associated with a system. Experience indicates that the degree of safety achieved in a system is directly dependent upon the emphasis given. The program manager and the developer must apply this emphasis during all phases of the system's life cycle. A safe design is a prerequisite for safe operations, with the goal being to produce an inherently safe product that will have the minimum safety-imposed operational restrictions.

A.4.1.1 System safety in environmental and health hazard management. DoD 5000.2-R has directed the integration of environmental, safety, and health hazard management into the systems engineering process. While environmental and health hazard management are normally associated with the application of statutory direction and requirements, the management of mishap risk associated with actual environmental and health hazards is directly addressed by the system safety approach. Therefore, environmental and health hazards can be analyzed and managed with the same tools as any other hazard, whether they affect equipment, the environment, or personnel.

A.4.2 Purpose (see 1.1). All DoD program managers shall establish and execute programs that manage the probability and severity of all hazards for their systems (DoD 5000.2-R). Provision for system safety requirements and effort as defined by this standard should be included in all applicable contracts negotiated by DoD. These contracts include those negotiated within each DoD agency, by one DoD agency for another, and by DoD for other Government agencies. In addition, each DoD in-house program will address system safety.

A.4.2.1 Solicitations and contracts. Apply the requirements of section 4 to acquisitions. Incorporate MIL-STD-882 in the list of contractual compliance documents, and include the potential of a developer to execute section 4 requirements as source selection evaluation criteria. Developers are encouraged to submit with their proposal a preliminary plan that describes the system safety effort required for the requested program. When directed by the program manager, attach this preliminary plan to the contract or reference it within the statement of work; so it becomes the basis for a contractual system safety program.

A.4.3 System safety planning. Before formally documenting the system safety approach, the program manager, in concert with systems engineering and associated system safety

professionals, must determine what system safety effort is necessary to meet program and regulatory requirements. This effort will be built around the requirements set forth in section 4 and includes developing a planned approach for safety task accomplishment, providing qualified people to accomplish the tasks, establishing the authority for implementing the safety tasks through all levels of management, and allocating appropriate resources to ensure that the safety tasks are completed.

A.4.3.1 System safety planning subtasks. System safety planning subtasks should:

a. Establish specific safety performance requirements (see A.4.3.2) based on overall program requirements and system user inputs.

b. Establish a system safety organization or function and the required lines of communication with associated organizations (government and contractor). Establish interfaces between system safety and other functional elements of the program, as well as with other safety and engineering disciplines (such as nuclear, range, explosive, chemical, and biological). Designate the organizational unit responsible for executing each safety task. Establish the authority for resolution of identified hazards.

c. Establish system safety milestones and relate these to major program milestones, program element responsibility, and required inputs and outputs.

d. Establish an incident alerting/notification, investigation, and reporting process, to include notification of the program manager.

e. Establish an acceptable level of mishap risk, mishap probability and severity thresholds, and documentation requirements (including but not limited to hazards and residual mishap risk).

f. Establish an approach and methodology for reporting to the program manager the following minimum information:

(1) Safety critical characteristics and features.

(2) Operating, maintenance, and overhaul safety requirements.

(3) Measures used to eliminate or mitigate hazards.

(4) Acquisition management of hazardous materials.

g. Establish the method for the formal acceptance and documenting of residual mishap risks and the associated hazards.

h. Establish the method for communicating hazards, the associated risks, and residual mishap risk to the system user.

i. Specify requirements for other specialized safety approvals (e.g., nuclear, range, explosive, chemical, biological, electromagnetic radiation, and lasers) as necessary (reference 6.6 and 6.7).

A.4.3.2 Safety performance requirements. These are the general safety requirements needed to meet the core program objectives. The more closely these requirements relate to a given program, the more easily the designers can incorporate them into the system. In the appropriate system specifications, incorporate the safety performance requirements that are applicable, and the specific risk levels considered acceptable for the system. Acceptable risk levels can be defined in terms of: a hazard category developed through a mishap risk assessment matrix; an overall system mishap rate; demonstration of controls required to preclude unacceptable conditions; satisfaction of specified standards and regulatory requirements; or other suitable mishap risk assessment procedures. Listed below are examples of safety performance statements.

a. Quantitative requirements. Quantitative requirements are usually expressed as a failure or mishap rate, such as "The catastrophic system mishap rate shall not exceed x.xx X 10^{-y} per operational hour."

b. Mishap risk requirements. Mishap risk requirements could be expressed as "No hazards assigned a Catastrophic mishap severity are acceptable." Mishap risk requirements could also be expressed as a level defined by a mishap risk assessment (see A.4.4.3.2.3), such as "No Category 3 or higher mishap risks are acceptable."

c. Standardization requirements. Standardization requirements are expressed relative to a known standard that is relevant to the system being developed. Examples include: "The system will comply with the laws of the State of XXXXX and be operable on the highways of the State of XXXXX" or "The system will be designed to meet ANSI Std XXX as a minimum."

A.4.3.3 Safety design requirements. The program manager, in concert with the chief engineer and utilizing systems engineering and associated system safety professionals, should establish specific safety design requirements for the overall system. The objective of safety design requirements is to achieve acceptable mishap risk through a systematic application of design guidance from standards, specifications, regulations, design handbooks, safety design checklists, and other sources. Review these for safety design parameters and acceptance criteria applicable to the system. Safety design requirements derived from the selected parameters, as well as any associated acceptance criteria, are included in the system specification. Expand these requirements and criteria for inclusion in the associated follow-on or lower level specifications. See general safety system design requirements below.

a. Hazardous material use is minimized, eliminated, or associated mishap risks are reduced through design, including material selection or substitution. When using potentially hazardous materials, select those materials that pose the least risk throughout the life cycle of the system.

b. Hazardous substances, components, and operations are isolated from other activities, areas, personnel, and incompatible materials.

c. Equipment is located so that access during operations, servicing, repair, or adjustment minimizes personnel exposure to hazards (e.g., hazardous substances, high voltage, electromagnetic radiation, and cutting and puncturing surfaces).

d. Protect power sources, controls, and critical components of redundant subsystems by physical separation or shielding, or by other acceptable methods.

f. Consider safety devices that will minimize mishap risk (e.g., interlocks, redundancy, fail safe design, system protection, fire suppression, and protective measures such as clothing, equipment, devices, and procedures) for hazards that cannot be eliminated. Make provisions for periodic functional checks of safety devices when applicable.

g. System disposal (including explosive ordnance disposal) and demilitarization are considered in the design.

h. Implement warning signals to minimize the probability of incorrect personnel reaction to those signals, and standardize within like types of systems.

i. Provide warning and cautionary notes in assembly, operation, and maintenance instructions; and provide distinctive markings on hazardous components, equipment, and facilities to ensure personnel and equipment protection when no alternate design approach can eliminate a hazard. Use standard warning and cautionary notations where multiple applications occur. Standardize notations in accordance with commonly accepted commercial practice or, if none exists, normal military procedures. Do not use warning, caution, or other written advisory as the only risk reduction method for hazards assigned to Catastrophic or Critical mishap severity categories.

j. Safety critical tasks may require personnel proficiency; if so, the developer should propose a proficiency certification process to be used.

k. Severity of injury or damage to equipment or the environment as a result of a mishap is minimized.

l. Inadequate or overly restrictive requirements regarding safety are not included in the system specification.

m. Acceptable risk is achieved in implementing new technology, materials, or designs in an item's production, test, and operation. Changes to design, configuration, production, or mission requirements (including any resulting system modifications and upgrades, retrofits, insertions of new technologies or materials, or use of new production or test techniques) are accomplished in a manner that maintains an acceptable level of mishap risk. Changes to the environment in which the system operates are analyzed to identify and mitigate any resulting hazards or changes in mishap risks.

A.4.3.3.1 Some program managers include the following conditions in their solicitation, system specification, or contract as requirements for the system design. These condition statements are used optionally as supplemental requirements based on specific program needs.

A.4.3.3.1.1 Unacceptable conditions. The following safety critical conditions are considered unacceptable for development efforts. Positive action and verified implementation is required to reduce the mishap risk associated with these situations to a level acceptable to the program manager.

a. Single component failure, common mode failure, human error, or a design feature that could cause a mishap of Catastrophic or Critical mishap severity catagories.

b. Dual independent component failures, dual independent human errors, or a combination of a component failure and a human error involving safety critical command and control functions, which could cause a mishap of Catastrophic or Critical mishap severity catagories.

c. Generation of hazardous radiation or energy, when no provisions have been made to protect personnel or sensitive subsystems from damage or adverse effects.

d. Packaging or handling procedures and characteristics that could cause a mishap for which no controls have been provided to protect personnel or sensitive equipment.

e. Hazard categories that are specified as unacceptable in the development agreement.

A.4.3.3.1.2 Acceptable conditions. The following approaches are considered acceptable for correcting unacceptable conditions and will require no further analysis once mitigating actions are implemented and verified.

a. For non-safety critical command and control functions: a system design that requires two or more independent human errors, or that requires two or more independent failures, or a combination of independent failure and human error.

b. For safety critical command and control functions: a system design that requires at least three independent failures, or three independent human errors, or a combination of three independent failures and human errors.

c. System designs that positively prevent errors in assembly, installation, or connections that could result in a mishap.

d. System designs that positively prevent damage propagation from one component to another or prevent sufficient energy propagation to cause a mishap.

e. System design limitations on operation, interaction, or sequencing that preclude occurrence of a mishap.

f. System designs that provide an approved safety factor, or a fixed design allowance that limits, to an acceptable level, possibilities of structural failure or release of energy sufficient to cause a mishap.

g. System designs that control energy build-up that could potentially cause a mishap (e.g., fuses, relief valves, or electrical explosion proofing).

h. System designs where component failure can be temporarily tolerated because of residual strength or alternate operating paths, so that operations can continue with a reduced but acceptable safety margin.

i. System designs that positively alert the controlling personnel to a hazardous situation where the capability for operator reaction has been provided.

j. System designs that limit or control the use of hazardous materials.

A.4.3.4 Elements of an effective system safety effort. Elements of an effective system safety effort include:

a. Management is always aware of the mishap risks associated with the system, and formally documents this awareness. Hazards associated with the system are identified, assessed, tracked, monitored, and the associated risks are either eliminated or controlled to an acceptable level throughout the life cycle. Identify and archive those actions taken to eliminate or reduce mishap risk for tracking and lessons learned purposes.

b. Historical hazard and mishap data, including lessons learned from other systems, are considered and used.

c. Environmental protection, safety, and occupational health, consistent with mission requirements, are designed into the system in a timely, cost-effective manner. Inclusion of the appropriate safety features is accomplished during the applicable phases of the system life cycle.

d. Mishap risk resulting from harmful environmental conditions (e.g., temperature, pressure, noise, toxicity, acceleration, and vibration) and human error in system operation and support is minimized.

e. System users are kept abreast of the safety of the system and included in the safety decision process.

A.4.4 System safety engineering effort. As stated in section 4, a system safety engineering effort consists of eight main requirements. The following paragraphs provide further descriptions on what efforts are typically expected due to each of the system safety requirements listed in section 4.

A.4.4.1 Documentation of the system safety approach. The documentation of the system safety approach should describe the planned tasks and activities of system safety management

and system engineering required to identify, evaluate, and eliminate or control hazards, or to reduce the residual mishap risk to a level acceptable throughout the system life cycle. The documentation should describe, as a minimum, the four elements of an effective system safety effort: a planned approach for task accomplishment, qualified people to accomplish tasks, the authority to implement tasks through all levels of management, and the appropriate commitment of resources (both manning and funding) to ensure that safety tasks are completed. Specifically, the documentation should:

a. Describe the scope of the overall system program and the related system safety effort. Define system safety program milestones. Relate these to major program milestones, program element responsibility, and required inputs and outputs.

b. Describe the safety tasks and activities of system safety management and engineering. Describe the interrelationships between system safety and other functional elements of the program. List the other program requirements and tasks applicable to system safety and reference where they are specified or described. Include the organizational relationships between other functional elements having responsibility for tasks with system safety impacts and the system safety management and engineering organization including the review and approval authority of those tasks.

c. Describe specific analysis techniques and formats to be used in qualitative or quantitative assessments of hazards, their causes, and effects.

d. Describe the process through which management decisions will be made (for example, timely notification of unacceptable risks, necessary action, incidents or malfunctions, waivers to safety requirements, and program deviations). Include a description on how residual mishap risk is formally accepted and this acceptance is documented.

e. Describe the mishap risk assessment procedures, including the mishap severity categories, mishap probability levels, and the system safety design order of precedence that should be followed to satisfy the safety requirements of the program. State any qualitative or quantitative measures of safety to be used for mishap risk assessment including a description of the acceptable and unacceptable risk levels (if applicable). Include system safety definitions that modify, deviate from, or are in addition to those in this standard or generally accepted by the system safety community (see *Defense Acquisition Deskbook* and System Safety Society's *System Safety Analysis Handbook)* (see A.6.1).

f. Describe how resolution and action relative to system safety will be implemented at the program management level possessing resolution authority.

g. Describe the verification (e.g., test, analysis, demonstration, or inspection) requirements for ensuring that safety is adequately attained. Identify any certification requirements for software, safety devices, or other special safety features (e.g., render safe and emergency disposal procedures).

h. Describe the mishap or incident notification, investigation, and reporting process for the program, including notification of the program manager.

i. Describe the approach for collecting and processing pertinent historical hazard, mishap, and safety lessons learned data. Include a description on how a system hazard log is developed and kept current (see A.4.4.8.1).

j. Describe how the user is kept abreast of residual mishap risk and the associated hazards.

A.4.4.2 Identification of hazards. Identify hazards through a systematic hazard analysis process encompassing detailed analysis of system hardware and software, the environment (in which the system will exist), and the intended usage or application. Historical hazard and mishap data, including lessons learned from other systems, are considered and used.

A.4.4.2.1 Approaches for identifying hazards. Numerous approaches have been developed and used to identify system hazards. A key aspect of many of these approaches is empowering the design engineer with the authority to design safe systems and the responsibility to identify to program management the hazards associated with the design. Hazard identification approaches often include using system users in the effort. Commonly used approaches for identifying hazards can be found in the *Defense Acquisition Deskbook* and System Safety Society's *System Safety Analysis Handbook* (see A.6.1)

A.4.4.3 Assessment of mishap risk. Assess the severity and probability of the mishap risk associated with each identified hazard, i.e., determine the potential impact of the hazard on personnel, facilities, equipment, operations, the public, or environment, as well as on the system itself. Other factors, such as numbers of persons exposed, may also be used to assess risk.

A.4.4.3.1 Mishap risk assessment tools. To determine what actions to take to eliminate or control identified hazards, a system of determining the level of mishap risk involved must be developed. A good mishap risk assessment tool will enable decision makers to properly understand the level of mishap risk involved, relative to what it will cost in schedule and dollars to reduce that mishap risk to an acceptable level.

A.4.4.3.2 Tool development. The key to developing most mishap risk assessment tools is the characterization of mishap risks by mishap severity and mishap probability. Since the highest system safety design order of precedence is to eliminate hazards by design, a mishap risk assessment procedure considering only mishap severity will generally suffice during the early design phase to minimize the system's mishap risks (for example, just don't use hazardous or toxic material in the design). When all hazards cannot be eliminated during the early design phase, a mishap risk assessment procedure based upon the mishap probability as well as the mishap severity provides a resultant mishap risk assessment. The assessment is used to establish priorities for corrective action, resolution of identified hazards, and notification to management of the mishap risks. The information provided here is a suggested tool and set of definitions that can be used. Program managers can develop tools and definitions appropriate to their individual programs.

A.4.4.3.2.1 Mishap severity. Mishap severity categories are defined to provide a qualitative measure of the most reasonable credible mishap resulting from personnel error, environmental conditions, design inadequacies, procedural deficiencies, or system, subsystem, or component failure or malfunction. Suggested mishap severity categories are shown in Table A-I. The dollar values shown in this table should be established on a system by system basis depending on the size of the system being considered to reflect the level of concern.

TABLE A-I. **Suggested mishap severity categories.**

Description	Category	Environmental, Safety, and Health Result Criteria
Catastrophic	I	Could result in death, permanent total disability, loss exceeding $1M, or irreversible severe environmental damage that violates law or regulation.
Critical	II	Could result in permanent partial disability, injuries or occupational illness that may result in hospitalization of at least three personnel, loss exceeding $200K but less than $1M, or reversible environmental damage causing a violation of law or regulation.
Marginal	III	Could result in injury or occupational illness resulting in one or more lost work days(s), loss exceeding $10K but less than $200K, or mitigatible environmental damage without violation of law or regulation where restoration activities can be accomplished.
Negligible	IV	Could result in injury or illness not resulting in a lost work day, loss exceeding $2K but less than $10K, or minimal environmental damage not violating law or regulation.

NOTE: These mishap severity categories provide guidance to a wide variety of programs. However, adaptation to a particular program is generally required to provide a mutual understanding between the program manager and the developer as to the meaning of the terms used in the category definitions. Other risk assessment techniques may be used provided that the user approves them.

A.4.4.3.2.2 Mishap probability. Mishap probability is the probability that a mishap will occur during the planned life expectancy of the system. It can be described in terms of potential occurrences per unit of time, events, population, items, or activity. Assigning a quantitative mishap probability to a potential design or procedural hazard is generally not possible early in the design process. At that stage, a qualitative mishap probability may be

derived from research, analysis, and evaluation of historical safety data from similar systems. Supporting rationale for assigning a mishap probability is documented in hazard analysis reports. Suggested qualitative mishap probability levels are shown in Table A-II.

TABLE A-II. **Suggested mishap probability levels.**

Description*	Level	Specific Individual Item	Fleet or Inventory**
Frequent	A	Likely to occur often in the life of an item, with a probability of occurrence greater than 10^{-1} in that life.	Continuously experienced.
Probable	B	Will occur several times in the life of an item, with a probability of occurrence less than 10^{-1} but greater than 10^{-2} in that life.	Will occur frequently.
Occasional	C	Likely to occur some time in the life of an item, with a probability of occurrence less than 10^{-2} but greater than 10^{-3} in that life.	Will occur several times.
Remote	D	Unlikely but possible to occur in the life of an item, with a probability of occurrence less than 10^{-3} but greater than 10^{-6} in that life.	Unlikely, but can reasonably be expected to occur.
Improbable	E	So unlikely, it can be assumed occurrence may not be experienced, with a probability of occurrence less than 10^{-6} in that life.	Unlikely to occur, but possible.

*Definitions of descriptive words may have to be modified based on quantity of items involved.

**The expected size of the fleet or inventory should be defined prior to accomplishing an assessment of the system.

A.4.4.3.2.3 Mishap risk assessment. Mishap risk classification by mishap severity and mishap probability can be performed by using a mishap risk assessment matrix. This assessment allows one to assign a mishap risk assessment value to a hazard based on its mishap severity and its mishap probability. This value is then often used to rank different hazards as to their associated mishap risks. An example of a mishap risk assessment matrix is shown at Table A-III.

TABLE A-III. **Example mishap risk assessment values.**

SEVERITY PROBABILITY	Catastrophic	Critical	Marginal	Negligible
Frequent	1	3	7	13
Probable	2	5	9	16
Occasional	4	6	11	18
Remote	8	10	14	19
Improbable	12	15	17	20

A.4.4.3.2.4 Mishap risk categories. Mishap risk assessment values are often used in grouping individual hazards into mishap risk categories. Mishap risk categories are then used to generate specific action such as mandatory reporting of certain hazards to management for action or formal acceptance of the associated mishap risk. Table A-IV includes an example listing of mishap risk categories and the associated assessment values. In the example, the system management has determined that mishap risk assessment values 1 through 5 constitute "High" risk while values 6 through 9 constitute "Serious" risk.

TABLE A-IV. **Example mishap risk categories and mishap risk acceptance levels.**

Mishap Risk Assessment Value	Mishap Risk Category	Mishap Risk Acceptance Level
1 – 5	High	Component Acquisition Executive
6 – 9	Serious	Program Executive Officer
10 – 17	Medium	Program Manager
18 – 20	Low	As directed

*Representative mishap risk acceptance levels are shown in the above table. Mishap risk acceptance is discussed in paragraph A.4.4.7. The using organization must be consulted by the corresponding levels of program management prior to mishap risk acceptance.

A.4.4.3.2.5 Mishap risk impact. The mishap risk impact is assessed, as necessary, using other factors to discriminate between hazards having the same mishap risk value. One might discriminate between hazards with the same mishap risk assessment value in terms of mission capabilities, or social, economic, and political factors. Program management will closely consult with the using organization on the decisions used to prioritize resulting actions.

A.4.4.3.3 Mishap risk assessment approaches. Commonly used approaches for assessing mishap risk can be found in the *Defense Acquisition Deskbook* and System Safety Society's *System Safety Analysis Handbook* (see A.6.1)

A.4.4.4 Identification of mishap risk mitigation measures. Identify potential mishap risk mitigation alternatives and the expected effectiveness of each alternative or method. Mishap risk mitigation is an iterative process that culminates when the residual mishap risk has been reduced to a level acceptable to the appropriate authority.

A.4.4.4.1 Prioritize hazards for corrective action. Hazards should be prioritized so that corrective action efforts can be focused on the most serious hazards first. A categorization of hazards may be conducted according to the mishap risk potential they present.

A.4.4.4.2 System safety design order of precedence (see 4.4). The ultimate goal of a system safety program is to design systems that contain no hazards. However, since the nature of most complex systems makes it impossible or impractical to design them completely hazard-free, a successful system safety program often provides a system design where there exist no hazards resulting in an unacceptable level of mishap risk. As hazard analyses are performed, hazards will be identified that will require resolution. The system safety design order of precedence defines the order to be followed for satisfying system safety requirements and reducing risks. The alternatives for eliminating the specific hazard or controlling its associated risk are evaluated so that an acceptable method for mishap risk reduction can be agreed to.

A.4.4.5 Reduction of mishap risk to an acceptable level. Reduce the system mishap risk through a mitigation approach mutually agreed to by the developer, program manager and the using organization.

A.4.4.5.1 Communication with associated test efforts. Residual mishap risk and associated hazards must be communicated to the system test efforts for verification.

A.4.4.6 Verification of mishap risk reduction. Verify the mishap risk reduction and mitigation through appropriate analysis, testing, or inspection. Document the determined residual mishap risk. The program manager must ensure that the selected mitigation approaches will result in the expected residual mishap risk. To provide this assurance, the system test effort should verify the performance of the mitigation actions. New hazards identified during testing must be reported to the program manager and the developer.

A.4.4.6.1 Testing for a safe design. Tests and demonstrations must be defined to validate selected safety features of the system. Test or demonstrate safety critical equipment and procedures to determine the mishap severity or to establish the margin of safety of the design. Consider induced or simulated failures to demonstrate the failure mode and acceptability of safety critical equipment. When it cannot be analytically determined whether the corrective action taken will adequately control a hazard, conduct safety tests to evaluate the effectiveness of the controls. Where costs for safety testing would be prohibitive, safety characteristics or procedures may be verified by engineering analyses, analogy, laboratory test, functional mockups, or subscale/model simulation. Integrate testing of safety systems into appropriate system test and demonstration plans to the maximum extent possible.

A.4.4.6.2 Conducting safe testing. The program manager must ensure that test teams are familiar with mishap risks of the system. Test plans, procedures, and test results for all tests including design verification, operational evaluation, production acceptance, and shelf-life validation should be reviewed to ensure that:

a. Safety is adequately demonstrated.

b. The testing will be conducted in a safe manner.

c. All additional hazards introduced by testing procedures, instrumentation, test hardware, and test environment are properly identified and controlled.

A.4.4.6.3 Communication of new hazards identified during testing. Testing organizations must ensure that hazards and safety discrepancies discovered during testing are communicated to the program manager and the developer.

A.4.4.7 Review and acceptance of residual mishap risk by the appropriate authority. Notify the program manager of identified hazards and residual mishap risk. For long duration programs, incremental or periodic reporting should be used.

A.4.4.7.1 Residual mishap risk. The mishap risk that remains after all planned mishap risk management measures have been implemented is considered residual mishap risk. Residual mishap risk is documented along with the reason(s) for incomplete mitigation.

A.4.4.7.2 Residual mishap risk management. The program manager must know what residual mishap risk exists in the system being acquired. For significant mishap risks, the program manager is required to elevate reporting of residual mishap risk to higher levels of appropriate authority (such as the Program Executive Officer or Component Acquisition Executive) for action or acceptance. The program manager is encouraged to apply additional resources or other remedies to help the developer satisfactorily resolve hazards providing significant mishap risk. Table A-IV includes an example of a mishap risk acceptance level matrix based on the mishap risk assessment value and mishap risk category.

A.4.4.7.3 Residual mishap risk acceptance. The program manager is responsible for formally documenting the acceptance of the residual mishap risk of the system by the appropriate authority. The program manager should update this residual mishap risk and the associated hazards to reflect changes/modifications in the system or its use. The program manager and using organization should jointly determine the updated residual mishap risk prior to acceptance of the risk and system hazards by the risk acceptance authority, and should document the agreement between the user and the risk acceptance authority.

A.4.4.8 Tracking hazards and residual mishap risk. Track hazards, their closures, and residual mishap risk. A tracking system for hazards, their closures, and residual mishap risk must be maintained throughout the system life cycle. The program manager must keep the system user apprised of system hazards and residual mishap risk.

A.4.4.8.1 Process for tracking of hazards and residual mishap risk. Each system must have a current log of identified hazards and residual mishap risk, including an assessment of the residual mishap risk (see A.4.4.7). As changes are integrated into the system, this log is updated to incorporate added or changed hazards and the associated residual mishap risk. The Government must formally acknowledge acceptance of system hazards and residual mishap risk. Users will be kept informed of hazards and residual mishap risk associated with their systems.

A.4.4.8.1.1 Developer responsibilities for communications, acceptance, and tracking of hazards and residual mishap risk. The developer (see 3.2.2) is responsible for communicating information to the program manager on system hazards and residual mishap risk, including any unusual consequences and costs associated with hazard mitigation. After attempting to eliminate or mitigate system hazards, the developer will formally document and notify the program manager of all hazards breaching thresholds set in the safety design criteria. At the same time, the developer will also communicate the system residual mishap risk.

A.4.4.8.1.2 Program manager responsibilities for communications, acceptance, and tracking of hazards and residual mishap risk. The program manager is responsible for maintaining a log of all identified hazards and residual mishap risk for the system. The program manager will communicate known hazards and associated risks of the system to all system developers and users. As changes are integrated into the system, the program manager shall update this log to incorporate added or changed hazards and the residual mishap risk identified by the developer. The program manager is also responsible for informing system developers about the program manager's expectations for handling of newly discovered hazards. The program manager will evaluate new hazards and the resulting residual mishap risk, and either recommend further action to mitigate the hazards, or formally document the acceptance of these hazards and residual mishap risk. The program manager will evaluate the hazards and associated residual mishap risk in close consultation and coordination with the ultimate end user, to assure that the context of the user requirements, potential mission capability, and the operational environment are adequately addressed. Copies of the documentation of the hazard and risk acceptance will be provided to both the developer and the system user. Hazards for which the program manager accepts responsibility for mitigation will also be included in the formal documentation. For example, if the program manager decides to execute a special training program to mitigate a potentially hazardous situation, this approach will be documented in the formal response to the developer. Residual mishap risk and hazards must be communicated to system test efforts for verification.

A.5 SPECIFIC REQUIREMENTS

A.5.1 Program manager responsibilities. The program manager must ensure that all types of hazards are identified, evaluated, and mitigated to a level compliant with acquisition management policy, federal (and state where applicable) laws and regulations, Executive Orders, treaties, and agreements. The program manager should:

A.5.1.1 Establish, plan, organize, implement, and maintain an effective system safety effort that is integrated into all life cycle phases.

A.5.1.2 Ensure that system safety planning is documented to provide all program participants with visibility into how the system safety effort is to be conducted.

A.5.1.3 Establish definitive safety requirements for the procurement, development, and sustainment of the system. The requirements should be set forth clearly in the appropriate system specifications and contractual documents.

A.5.1.4 Provide historical safety data to developers.

A.5.1.5 Monitor the developer's system safety activities and review and approve delivered data in a timely manner, if applicable, to ensure adequate performance and compliance with safety requirements.

A.5.1.6 Ensure that the appropriate system specifications are updated to reflect results of analyses, tests, and evaluations.

A.5.1.7 Evaluate new lessons learned for inclusion into appropriate databases and submit recommendations to the responsible organization.

A.5.1.8 Establish system safety teams to assist the program manager in developing and implementing a system safety effort.

A.5.1.9 Provide technical data on Government-furnished Equipment or Government-furnished Property to enable the developer to accomplish the defined tasks.

A.5.1.10 Document acceptance of residual mishap risk and associated hazards.

A.5.1.11 Keep the system users apprised of system hazards and residual mishap risk.

A.5.1.12 Ensure the program meets the intent of the latest MIL-STD 882.

A.5.1.13 Ensure adequate resources are available to support the program system safety effort.

A.5.1.14 Ensure system safety technical and managerial personnel are qualified and certified for the job.

A.6 NOTES

A.6.1 DoD acquisition practices and safety analysis techniques. Information on DoD acquisition practices and safety analysis techniques is available at the referenced Internet sites. Nothing in the referenced information is considered binding or additive to the requirements provided in this standard.

A.6.1.1 *Defense Acquisition Deskbook*. Wright-Patterson Air Force Base, Ohio: Deskbook Joint Program Office.

A.6.1.2 *System Safety Analysis Handbook.* Unionville, VA: System Safety Society.

CONCLUDING MATERIAL

Custodians:
Army - AV
Navy - AS
Air Force – 40

Preparing activity:
Air Force - 40

Project SAFT - 0038

Reviewing activities:
Army - AR, AT, CR, MI
Navy - EC, OS, SA, SH
Air Force - 10, 11, 13, 19

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE *(YYYYMMDD)*
	MIL-STD-882	20000210

3. DOCUMENT TITLE

System Safety

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include zip code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) DSN *(if applicable)*	7. DATE SUBMITTED *(YYYYMMDD)*

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE *(Include Area Code)*
Headquarters, Air Force Materiel Command System Safety Division	(1) Commercial (937) 257-6007 (2) DSN 787-6007
b. ADDRESS *(Include Zip Code)* HQ AFMC/SES 4375 Chidlaw Road Wright Patterson AFB, Ohio 45433-5006	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** **Defense Standardization Program Office (DLSC-LM)** **8725 John J. Kingman Road, Suite 2533** **Fort Belvoir, Virginia 22060-6221** **Telephone 703 767-6888 DSN 427-6888**

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TAB 65

Army Regulation 700–142

Logistics

Type Classification, Materiel Release, Fielding, and Transfer

Rapid Action Revision (RAR) Issue Date: 16 October 2008

Headquarters
Department of the Army
Washington, DC
26 March 2008

UNCLASSIFIED

SUMMARY of CHANGE

AR 700-142
Type Classification, Materiel Release, Fielding, and Transfer

This rapid action revision, dated 16 October 2008--

- Combines type classification and materiel release required, materiel release not required (type classification is required), and materiel release required (type classification previously established or not required) (table 1-1).
- Incorporates Code S for discontinued items and synchronizes logistics control code definitions with DA Pam 708-3 (table 3-2).
- Reflects changes to accommodate nondevelopmental commercial products (paras 3-3*g*(2), 4-1*d*(2), 4-1*g*(3)(*b*), and 4-4*a*(2)).
- Substitutes the Communication Electronics Research, Development and Engineering Center process for the Operational Test Agency Milestone assessment report (table 3-3, note 4).
- Modifies materiel release activities/documents and full materiel release requirements (tables 4-1, 4-2, and 4-3).
- Modifies software materiel release policy and adds software materiel release and software release requirements tables (para 4-6).
- Redefines materiel release conditions and conditional materiel release actions (para 4-7*a*).
- Identifies new policy for conditional materiel releases where materiel has been pulled from the field or replaced with a new item (para 4-7*e*).
- Revises customer documentation and hand-off procedures (para 5-10).
- Makes additional rapid action revision changes (chaps 1, 2, 4, and 6).
- Removes all references to the materiel release review board which allows life cycle management commands to establish by local policy (throughout).
- Makes administrative changes (throughout).

Headquarters
Department of the Army
Washington, DC
26 March 2008

*Army Regulation 700–142

Effective 26 April 2008

Logistics

Type Classification, Materiel Release, Fielding, and Transfer

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the Secretary of the Army

History. This publication is a rapid action revision (RAR). This RAR is effective 16 November 2008. The portions affected by this RAR are listed in the summary of change.

Summary. This regulation prescribes Department of the Army policy and responsibilities for the Army's type classification, materiel release, fielding, and transfer processes.

Applicability. This regulation applies to the Active Army, the Army National Guard/Army National Guard of the United States, and the U.S. Army Reserve, unless otherwise stated.

Proponent and exception authority. The proponent of this regulation is the Assistant Secretary of the Army (Acquisition, Logistics and Technology). The proponent has the authority to approve exceptions or waivers to this regulation that are consistent with controlling law and regulations. The proponent may delegate this approval authority, in writing, to a division chief within the proponent agency or its direct reporting unit or field operating agency, in the grade of colonel or the civilian equivalent. Activities may request a waiver to this regulation by providing justification that includes a full analysis of the expected benefits and must include formal review by the activity's senior legal officer. All waiver requests will be endorsed by the commander or senior leader of the requesting activity and forwarded through their higher headquarters to the policy proponent. Refer to AR 25–30 for specific guidance.

Army management control process. This regulation contains management control provisions and identifies key management controls that must be evaluated (see app B).

Supplementation. Supplementation of this regulation and establishment of command and local forms are prohibited without prior approval from the Assistant Secretary of the Army (Acquisition, Logistics and Technology) (SAAL–ZL), 103 Army Pentagon, Washington DC 20310–0103.

Suggested improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (SAAL–ZL), 103 Army Pentagon, Washington DC 20310–0103.

Distribution. This publication is available in electronic media only and is intended for command levels C, D, and E for the Active Army, the Army National Guard/Army National Guard of the United States, and the U.S. Army Reserve.

Contents (Listed by paragraph and page number)

*This regulation supersedes AR 700–142, dated 21 February 2006.

UNCLASSIFIED

3–6. Basis-of-issue plans

The BOIPs establish the documentation necessary to authorize, procure, support, account, maintain and report readiness/availability and are integral to designating TC–STD.

a. A USAFMSA "approved for staffing" BOIP may be used to establish TC–STD designation. A USAFMSA "approved for staffing" BOIP is the formal BOIP that USAFMSA sends out to the Army for coordination prior to formal approval of the BOIP.

b. The PMs/LCMCs will use SLAMIS to track the progress of the BOIP development.

c. A BOIP deferral may be used when a TC–STD designation is planned and a USAFMSA "approved for staffing" BOIP will not be available prior to FRP decision (see DA Pam 70–3 for procedures to request a BOIP deferral).

d. Approved BOIP Deferrals will be loaded along with the ADM as part of the enclosures required for MSR submissions to type classify an item via the SLAMIS Web site.

e. Materiel exempt from BOIP is listed in AR 71–32.

Chapter 4
Materiel Release

4–1. Purpose

Materiel release is the process used to ensure—

a. Materiel is safe for Soldiers when operated within stated parameters.

b. Materiel is suitable, has been fully tested, and meets operational performance requirements.

c. Materiel can be supported logistically within the environment it is intended to operate.

d. Systems achieve a full MR no later than—

(1) The FRP decision review (on developmental programs).

(2) Government acceptance of the materiel (after completion of qualification testing) on nondevelopmental programs for commercial products.

(a) In cases where Milestone C and FRP occur as simultaneous events, a FMR decision shall not be made until the government accepts the materiel and assigns TC-STD.

(b) TC-STD and FMR may occur simultaneously.

(c) The MDA in coordination with the MRA shall ensure all FMR requirements have been satisfied or request approval from the AAE to field as a CMR.

e. Critical MR and developmental/operational test and evaluation issues have been resolved or that provisions for their resolution have been made before a full release is granted.

f. All interoperability and network certifications requirements have been completed.

g. Conditionally released materiel—

(1) Attains a full materiel release in a timely manner, as defined by the approved get-well plan.

(2) Provides a mechanism to monitor, control, and ensure visibility and accountability of decisions made and actions taken.

(3) Has approval from AAE to—

(a) Proceed into FRP and field as CMR (developmental programs).

(b) Accept and field the materiel as CMR after qualification testing has been completed (nondevelopmental programs for commercial products.)

4–2. Policy

a. Systems must be safe, suitable (meets operational performance requirements), and logistically supportable not later than a full rate production decision and issue to Soldiers in the field.

b. The PMs who develop materiel for aviation systems will comply with the provisions of air worthiness outlined in AR 70–62 as an extension of the MR process.

c. The type of release—full, conditional, urgent, or training—will be recommended by the PM after a comprehensive assessment of the total materiel system (see para 4–5, which defines the requirements for MR and supporting documentation).

d. The lead PM responsible for fielding the primary materiel, will ensure the availability and operational capability of all support equipment. This includes materiel system computer resources, initial support resources, ammunition, ASIOE, general and special purpose TMDE, ATE, NET, and TADSS.

e. For systems containing explosives, the explosive component cannot be prepositioned, moved, or shipped to a GC until all safety requirements have been certified as being met or mitigated, as determined by the supporting safety office. This includes—

(1) The EOD supportability statement

(2) Safety confirmations.

(3) A final DOD hazard classification (FHC). If the FHC is not complete, an interim hazard classification (IHC) can be assigned provided the IHC authority is satisfied that the sponsoring organization is actively pursuing the FHC (see TB 700–2 for additional considerations).

(4) Approved transportation processes and procedures in accordance with 49 CFR 173.

f. Certifications used for TC may be used for MR when stated for dual use by the functional authority unless changes were made to the materiel.

g. A RFIC can be used for follow-on releases of ammunition and small arms that undergo continuous testing in their production environment. The RFIC is used for materiel systems unchanged since the last full MR, and where there are no logistics, performance, quality, or safety deficiencies.

(1) A RFIC is issued by AMC supporting command.

(2) The RFIC procedure documentation requirements are outlined in DA Pam 700–142.

(3) If there is a break in production of 2 or more years, or if the materiel is produced by a different contractor, the RFIC procedures can be used, provided that the criteria outlined in paragraph 4–2*e*(1) through 4–2*e*(4) are satisfied.

h. Materiel release policy applies to post-FRP decision review materiel that has been modified or upgraded as defined in chapter 1. Changes to a fielded software baseline must be approved by the portfolio manager (for example, Logistics – DCS, G–4) prior to use on the Army network. Depending on the extent of the change, the system may need to complete interoperability certification and network certification requirements another time.

4–3. Materiel release authority

An AMC LCMC with the sustainment mission is the approval authority for all materiel releases of assigned ACAT I–III programs and nonprogram of record materiel.

a. Materiel release approval for non AMC-supported materiel will be approved by the commander of the appropriate Army organization at the general officer level.

(1) The PEO simulation, training, and instrumentation is the MR authority for training aids, devices, simulators, simulations, instrumentation, targets and threat simulators for training and testing and combat training center instrumentation for which they are the materiel developer.

(2) Joint PEO chemical and biological defense is the MR authority for all chemical and biological technology, materiel and medicines for which they are the materiel developer.

b. The Commander, U.S. Army Joint Munitions Command is the MR authority for ammunition.

c. The MR authority will not be delegated below the commander; however—

(1) A deputy commander not lower than the grade of brigadier general or the civilian equivalent may approve an MR action in his/her absence.

(2) The joint munitions commander may appoint a person not lower than the grade of colonel or civilian equivalent to approve an MR action in his/her absence.

d. When there is a nonconcurrence by the Army logistician (DASA (APL)), ATEC, or functional authority on the release of any system, and it cannot be resolved by the MRA, the MRA will refer the release to the Commander, AMC for resolution.

4–4. Types of materiel release

There are four types of MR: full, conditional, urgent, and training.

a. Full materiel release. An FMR is the formal certification that the materiel is safe, suitable (meets all of its performance requirements), and supportable (logistically) when used within stated operational parameters. This certification provides the authorization to a PM to proceed to—

(1) An FRP decision review (on developmental programs) with all MR requirements satisfied.

(2) Fielding to Soldiers on nondevelopmental programs or when satisfying requirements with commercial products. In these cases, all FMR requirements must be satisfied. Criteria for FMR are found in paragraph 4–5.

b. Conditional materiel release.

(1) Conditional materiel release results when all criteria for a FMR are not met and may occur when—

(a) The AAE allows a program to proceed into FRP under a CMR.

(b) A program has no planned FRP as part of the approved acquisition strategy.

(c) A program fields LRIP materiel prior to FRP. In these cases, the PM will develop a plan to achieve a FMR at the FRP decision and address all LRIP materiel previously fielded.

(d) A post FRP program prepares to field an upgrade that meets the applicability criteria for MR (for example, a software version upgrade that meets the criteria to be a "software materiel release," a post-FRP hardware block upgrade, a modification work order (MWO), or modification). In these cases, the PM will develop a plan to achieve a FMR.

(2) A get-well plan is established that addresses each condition of release and plans for achieving an FMR. The PM must obtain GC acceptance of the established get-well plan and manage all residual risks as part of the CMR. The get-

well plan is a listing of each condition, the interim workaround, the date the condition is expected to be corrected by the PM, the functional authority that imposed the condition and the funding status to correct the condition. All get-well plans will be documented within the MRTS (see paras 4–7 and 4–12 for further guidance).

c. Urgent materiel release. A UMR is a limited certification that the materiel meets minimum safety requirements, is suitable based upon a requirements memorandum directed by an ONS or the DCS, G–3/5/7 (meets minimal stated performance objectives), and is supportable logistically (may not be Army preference) when used within stated operational parameters. The UMR allows the PM to field the materiel rapidly to meet a capability short fall. Detailed criteria for UMR can be found in paragraph 4–9.

d. Training materiel release. A TMR is a limited certification that provides authorization to a PM to field or issue the materiel to TRADOC/GC schools and training sites for the express purpose of curriculum development and training of Soldiers.

(1) A TMR may include—

(a) Prototype or test materiel.

(b) Materiel manufactured under conditions other than normal production.

(c) Materiel that is incomplete (major components missing or defective).

(d) Materiel where one or more of the requirements for full release have not been met.

(2) Before TMR approval, the PM will ensure that critical issues such as safety, availability of spare/repair parts, technical documentation, responsibility for maintenance support, and the other limitations of the materiel are identified and accepted by the trainer.

(3) A training item procured against a requirements document (initial capabilities document, CDD, CPD) will be released under normal MR categories (full, conditional, urgent) specified above.

(4) The requirements for a TMR can be found in paragraph 4–10.

4–5. Full materiel release requirements

The PM will ensure that all required MR activities are incorporated into the acquisition program baseline and accomplished prior to FRP decision review.

a. Provide the documentation listed in table 4–1 to the functional authority to certify completion of the required activity. The MR functional authority shall tailor the required activities with the program office.

b. Non-developmental business systems require Activities 1, 2, 4, 6, 7, 14, 16, 17–21, 23, 24, and 26–32 only.

c. A TMR will use selected activities from tables 4–1, 4–2, and 4–3 as outlined in paragraph 4–10.

d. The MR authority shall authorize full MR when the FMR requirements in tables 4–1, 4–2, and 4–3 are met.

(1) Functional authorities will provide a memorandum to the PM to address any activity/document that is not required for MR based upon the program and tailoring of requirements. This will be accomplished at milestone B.

(2) Organizations not assigned AMC LCMC support will substitute MDA approved organizations when using tables 4–1, 4–2, and 4–3 (for example, PEO simulation and instrumentation and JPEO CBD).

Table 4–1
Full materiel release requirements—Safety

Aspect/ Characteristic	Activity/ Document	FMR Requirements	Functional Authority
Safe Hazards are identified, and eliminated or accepted	1. Supporting safety office certification. 2. Surgeon General HHA (see AR 40–10, AR 602–2).[1] 3. AMC EOD supportability statement (see AR 75–15).[2] 4. Environmental statement (see AR 200–1, 32 CFR 651).[3] 5. Air worthiness statement (see AR 70–62).[4] 6. SSRA for residual hazards (see AR 385–10). 7. ATEC (DTC) safety confirmation (see AR 385–10). 8. Surface danger zone (see AR 385–63) 9. Final hazard classification (see 49 CFR 173 and TB 700–2). 10. NRC license (see 10 CFR, Chapter 1). 11. Army Fuse Safety Review Board Certification (see AR 385–10) 12. Energetic Materials Qualification (see local policy). 13. Ignition System Safety Review Board Certification (see MIL–STD–1901, Standardized Agreement (STANAG) 4368). 14. Safety review of TMS (see AR 25–30) 15. Results of safety inspections and analyses. 16. Software safety statement.	System safety aspects have been reviewed and verified by the supporting safety office. —All known safety hazards have been eliminated or accepted through the SSRA process in accordance with AR 385–10 —All statutory requirements are met. —Applicable regulatory requirements are met.	Safety Office

Notes:

[1] The HHA report is provided by the CHPPM on behalf of TSG.

[2] Determine EOD statement applicability using DA Pam 700–142. EOD statement will certify that validated and verified render safe and disposal procedures, tools and equipment, and training aids are fielded to Army EOD units and EOD schools at least 30 days prior to materiel release and that the new materiel is fully supportable by EOD units. It will also certify that the Joint Service TM 60 series have been approved by the Military Technical Acceptance Board at least 30 days prior to materiel release (see AR 75–15 to determine the materiel developer's responsibility for EOD supportability compliance during the development of the new materiel).

[3] The Environmental Statement must certify that the requirements of AR 200–1 and 32 CFR 651 have been met.

[4] If an airworthiness statement is not yet available, a FMR and subsequent FRP decision may be approved providing the request for system airworthiness has been submitted in accordance with AR 70–62 and there are no known issues that would prevent issuing the applicable airworthiness documents.

Table 4–2
Full materiel release requirements—Suitability

Aspect/ Characteristic	Activity/ Document	FMR requirements	Functional Authority
Suitable —Effectiveness —Survivability —MANPRINT —Reliability —Supportability —Interoperability	17. ATEC material release position memorandum. 18. ATEC OMAR or OER (see USC 139).	—The materiel been tested and evaluated in accordance with the approved test and evaluation master plan —Established requirements of the capabilities documents have been met or a decision has been made by the CBTDEV to accept the current performance; required with DCS, G–3/5/7 endorsement	ATEC
	19. CIO/G–6 Army interoperability certification statement (based upon AIC completion) (see AR 25–1) 20. Net worthiness certificate (see AR 25–1) 21. DIACAP certification statement (see AR 25–2) 22. Communications security logistics activity (CSLA) statement for COMSEC accreditation and availability.[2]	—Software (to include embedded software within platforms) has attained full or conditional AIC.[1] —Proper certifications for Networthiness and DIACAP are attained —COMSEC has been accredited by CSLA	CIO/G–6
	23. TRADOC training assessment (statement of adequacy of institutional training support) (see AR 350–1).	—Training determined adequate per AR 350–1.	TRADOC proponent
	24. Software suitability statement (normally provided by software engineering center of LCMC). 25. Quality, reliability, availability and maintainability statement, including service/shelf life assurance, Ammunition Stockpile Reliability Program (see AR 702–6), and Ammunition Surveillance Procedures (see SB 742–1).	—Software is suitable. —Reliability, availability and maintainability requirements have been achieved.[3]	Lead LCMC system engineering activity

Notes:

[1] Interim AIC results in CMR

[2] The CSLA COMSEC statement is not required when the materiel does not contain standalone COMSEC devices and supporting materials.

[3] In some cases such as missiles, the functional authority may waive the requirement to verify reliability with statistical confidence because of limited test assets (normally due to cost). If the LCMC Quality/Reliability assessment shows that there is only a low risk of not meeting the requirement(s), then the PM may establish a plan to verify RAM through analysis of field and stockpile test data. In these cases, the LCMC Quality/Reliability assessment shall show that a rigorous RAM program has been executed and present the qualitative data/analyses that provide non-statistical confidence in meeting the requirement(s). Such a program is outlined in SAE–JA1000 and shall include activities such as FMECA, Physics of Failure Analyses, Assessments based upon analogous or previous generation systems, and others (see SAE–JA1000–1)

Table 4–3
Full materiel release requirements—Supportability

Aspect/ Characteristic	Activity/ Document	FMR requirements	Functional Authority
Supportable —Integrated logistics support (ILS) elements (see AR 700–127)	26. Supportability certification — will also address support materiel (COEI and ASIOE) to end item and software (see AR 700–127).[1] 27. USATA supprtability statement on TMDE/ATE (see AR 750–43).[3] 28. TC designation.[4] 29. SDDC Transportation Engineering Agency transportability statement (see AR 70–47).[5] 30. Army logistician assessment (see AR 700–127).[6] 31. Supporting statements for COEI and ASIOE. 32. Software supportability statement (normally provided by software engineering center of LCMC).	Key SS performance aspects have been achieved as determined by the functional authorities.[2] —Maintenance planning accomplished and coordinated Army preference is in accordance with AR 750–1. —Manpower and personnel requirements to operate and maintain the system have been identified and documented. —Adequate supply support for fielding and sustainment of units (interim contract support (ICS), performance-based logistics, organic) has been established. —Support equipment is identified and documented at the appropriate organization, TMDE supportability has been addressed, footprint is minimized. —Technical data rights of use are established, TMs have been verified by the Government. —TM/IETM verification has been completed. —Training and training support (to include TADDS and ammunition requirements for training) have been identified, developed and documented; training is available for all GCs and maintainers —Maintenance of software is addressed in the SS (software development plan) and life cycle cost estimate and hardware for mission-critical systems are available at the appropriate organization. —Facilities requirements are developed and documented (maintenance, training storage, covered, humidity controlled, and so on). facilities are available. —Package, Handling, Storage And Transportation System is transportable by all modes as specified in the capability document. —Transportability has been evaluated by SDDC and documented accordingly —The PM has programmed funding for the support strategy within POM. (coordinate with the office of the DCS, G–3/5/7 (DAMO–TR). —Ammunition Stockpile Reliability Program and ammunition surveillance procedures are in place. —All environmental impacts have been identified, mitigated if possible, and documented in accordance with the National Environmental Protection Act and 32 CFR 651.	Lead LCMC ILS center or ILS directorate

Notes:

[1] The supportability certification will verify that key aspects of SS have been achieved; detail any known shortfalls and include with a recommended get-well plan. A system receiving an FMR that has ASIOE at less than FMR must get acceptance from the GC prior to fielding.

[2] Systems supported by planned ICS that have been funded, and have a transition plan for a longer term support strategy such as organic support may be fully released.

[3] The TMDE supportability statement is not required if TMDE is not being provided to the operator or field/sustainment maintenance provider.

[4] The PM will provide documented proof of type classification for materiel requiring TC. A TC–STD designation is required for a FMR. Status of open issues and planned interim measures from TC will be documented by the PM and included in the MR documentation provided to the functional authority.

[5] The SDDC transportability statement is not required if a system is found to be a transportability NON-problem item in accordance with AR 70–47.

[6] USAMMA will provide an Army logistician assessment, system effectiveness assessment, and safety statement for medical materiel.

4–6. Software materiel release and software release

A software MR (SMR) or a software release (SR) action is required for changes in software and/or firmware, including programs, routines and symbolic languages that control the functioning of the hardware and direct its operation (even when it is not part of a materiel modification).

a. When the materiel is fielded through the MR process, the software associated with that materiel is simultaneously certified.

(1) When the materiel (system) and software both require MR, the software is released as part of the materiel (system).

(2) When the materiel (system) does not require a MR, but the software does, the software will undergo the SMR process on its own.

b. Depending on the scope of the software change, software fixes sometimes called patches may be addressed using a SR provided safety, suitability and/or supportability are not affected.

c. Software materiel release is the upgrade of software that—

(1) Requires all software changes meet the requirements defined in paragraph 4–5 and table 4–5.

(2) Will be processed by the MR coordinator's office and be approved by the MRA.

(3) Will be classified as full, conditional, or urgent, as defined in paragraph 4–4.

(4) Will be approved by the DCS, G–3/5/7 in accordance with HQDA software blocking policy if it impacts battle command (BC) systems, or major releases of tactical network software

(5) Will be approved by the MR authority when the requirements in table 4–5 are met.

d. When one or more of the criteria listed in table 4–4 have been met, a SMR will be conducted.

Table 4–4
Software materiel release determination criteria

Criteria	Description
Interface change	Any software change that has the potential of adding or deleting an external interface to a system.
Source lines of code (SLOC) change	An incremental update consisting of a software change of more than 25 percent of SLOC or 25 percent cumulative equivalent SLOC changes not having required release approval since the last SMR. These criteria may be tightened at the discretion of the PM on the basis of criticality of the software changes
Functional capabilities change	Any software change that affects form, fit, or functions as defined by the capabilities documents
Architectural change	Any software change that has a significant and substantial impact on the architecture of the system.
Capability change impacting safety, suitability and/or supportability	Any software change that affects the suitability, supportability, maintainability, reliability, or safety of a system as determined by the supporting Functional Authority.
Translational change	An incremental update consisting of a software translation of 25 percent equivalent SLOC to a different computer programming language (for example, assembly speed up)
New test equipment or program of instruction change	Software changes that require new user level test equipment and/or that impact 25 percent or more of the trainer program of instruction.
Backward compatibility change	Software changes that result in a new version that is not backward compatible with the interoperability capabilities of the previous version(s) released to the field.
BC/tactical network software	Any software that affects BC systems, or major releases of tactical network software [1]

Notes.

[1] Must be approved by the DCS, G–3/5/7 in accordance with HODA software blocking policy.

Table 4–5
Software materiel release requirements

Aspect/Characteristic	Activity/Document	SMR requirements	Functional Authority
Safe Hazards are identified, and eliminated or accepted	1. Supporting safety office certification.[1] 2. Air worthiness statement (see AR 70–62) 3. SSRA for residual safety risks (see AR 385–10). 4. ATEC (DTC) safety confirmation (see AR 385–10). 5. Army Fuze Safety Review Board Certification (see AR 385–10). 6. Ignition System Safety Review Board Certification (see MIL-STD–1901, Standardized Agreement (STANAG) 4368). 7. Safety review of TMs (see AR 25–30). 8. Results of Safety inspections and analyses. 9. Software Safety Statement.	System safety aspects have been reviewed and verified by the supporting safety office. —All known safety hazards have been eliminated or accepted through the SSRA process in accordance with AR 385–10. —All statutory requirements are met. —Applicable regulatory requirements are met.	Supporting Safety office[2, 3]
Suitable —Effectiveness —Survivability —MANPRINT —Reliability —Supportability —Interoperability	10. ATEC materiel release position memorandum. 11. ATEC OMAR or OER (see 10 USC 139).[1]	The materiel has been tested and evaluated in accordance with the approved test and evaluation master plan. —Established requirements of the capabilities documents have been met or a decision has been made by the CBTDEV to accept the current performance; required with DCS, G–3/5/7 endorsement.	ATEC[2]
	12. CIO/G–6 Army interoperability certification statement (based on AIC completion) (see AR 25–1). 13. Net worthiness certificate (see AR 25–1) 14. DIACAP certification statement (see AR 25–2). 15. Communications Security Logistics Activity (CSLA) statement for COMSEC accreditation and availability.[4]	—Software (to include embedded software within platforms) has attained full or conditional AIC [5] —Proper certifications for Networthiness and DIACAP are attained —COMSEC has been accredited by CSLA	CIO/G–6[2]
	16. TRADOC training assessment (statement of adequacy of institutional training support) (see AR 350–1).	—Training determined adequate per AR 350–1	TRADOC proponent[2]
	17. Software suitability statement (normally provided by Software Engineering Center of LCMC) 18. Quality, reliability, availability, and maintainability statement	—Software is suitable —Reliability, availability and maintainability requirements have been achieved	Lead LCMC system engineering activity[2]

Table 4–5
Software materiel release requirements—Continued

Supportable Integreted logistics support (ILS) elements (see AR 700–127).	19. Supportability certification (will also address support materiel (COEI and ASIOE) to end item and software) (see AR 700–127).[6] 20. USATA supportability statement on TMDE/ATE (see AR 750–43).[7] 21. Army Logistician assessment (see AR 700–127).[1] 22. Supporting statements for COEI and ASIOE. 23. Software supportability statement (normally provided by Software Engineering Center of LCMC)	Key SS performance aspects have been achieved as determined by the functional authorities. —Support equipment is identified and documented at the appropriate organization; TMDE supportability has been addressed; footprint is minimized. —Technical data rights of use are established; TMs have been verified by the Government. —TM/IETM verification has been completed. —Training and training support (to include TADDS and ammunition requirements for training) have been identified, developed and documented, training is available for all GCs and maintainers. —Maintenance of software is addressed in the SS (software development plan) and life cycle cost estimate and hardware for mission-critical systems are available at the appropriate organization.	Lead LCMC[2, 3] ILS center or ILS directorate

Notes:

[1] USAMMA will provide an Army logistician assessment, system effectiveness assessment, and safety statement for medical materiel.

[2] A memorandum will be provided by all functional authorities to the PM to address any activity/document that is not required for MR based upon program and tailoring of requirements. This will be accomplished at milestone B.

[3] Organizations not assigned AMC LCMC support will substitute MDA approved organizations when using table (for example, PEO simulation and instrumentation and JPEO CBD).

[4] The CSLA COMSEC statement is not required unless the COMSEC functions are performed in the software (for example, the software is the COMSEC).

[5] Interim AIC results in CMR.

[6] The supportability certification will verify that key aspects of supportability strategy have been achieved; detail any known shortfalls and include with a recommended get-well plan.

[7] The TMDE supportability statement is required only if the software being released is a component of TMDE and has an impact on the adequacy of calibration and repair procedures, supply support, maintenance and training, technical data, and so forth.

e. Software releases (SRs) are changes to software that do not meet the criteria outlined in table 4–4. Software releases will be processed and approved by the MRA software engineering center (SEC). Software releases will be classified as full, conditional, database/dataset, or urgent, as delineated below.

(1) *Full software release.* Full software release (FSR) is authorized when the software has been fully tested, evaluated, and meets established quality, performance, reliability, maintainability, safety, suitability, environmental, interoperability, software supportability and configuration management requirements.

(2) *Conditional software release.* Conditional software release (CSR) may be authorized when one or more of the criteria for FSR have not been met.

(a) A CSR will be followed by a FSR when the conditions associated with the CSR have been corrected.

(b) A get-well plan is established that addresses each condition of release and plans for achieving a FSR. The PM must obtain GC acceptance of the established get-well plan and manage all residual risks as part of the CSR. The get well plan is a listing of each condition, the interim workaround, the date the condition is expected to be corrected, the proponent that will correct the condition and the funding status to correct the condition. All get-well plans will be documented by the supporting software engineering center (see para 4–7 for further guidance).

(3) *Database/dataset software release.* A database/dataset software release (DDSR) is the release of software in the form of a database/dataset to update currently fielded system software. A DDSR will be approved only after critical issues such as safety, availability of spare/repair parts, technical documentation, responsibility for maintenance support, interoperability, IA controls and other conditions that limit the use of the materiel have been adequately resolved.

(4) *Emergency software release.* Emergency software release (ESR) procedures may be authorized if there is an urgent request from the GC (colonel or equivalent). If the urgent request is due to a safety problem or a mission-essential function, then, in accordance with table 4–5, a SMR under urgent materiel release requirements is required. This GC request will contain a required delivery date, specify the urgency of need, and clearly define any safety problem or mission essential function that is required. When an ESR is requested, the SEC will ensure that a response is fielded, if possible, within 72 hours of the request. An ESR will be followed within 12 months by a FSR incorporating the functionality of the ESR. Emergency software releases are restricted to specific quantity (ies), location(s), or application(s).

f. Software release requirements are outlined in table 4–6.

Table 4–6
Software Release Requirements

Aspect/ Characteristic	Type Statement/ Certification	F	C	D	E	Functional Authority
Safe Hazards are identified, and eliminated or accepted.	1. Supporting safety office certification.	X	X	X	X	Supporting Safety Office.
Suitability —Effectiveness —Survivability —Reliability —Supportability —Interoperability	2. Airworthiness Statement (see AR 70–62).	X	X	X		AMCOM AED or other designated Airworthiness authority.
	3. CIO/G–6 Army interoperability certification statement (based on Army interoperability Certification (AIC) completion) (see AR 25–1).	X	X	X	X	Army CIO G–6.
	4. DIACAP certification statement (see AR 25–2).	X	X	X	X	Applicable MATDEV/PM/SM.
	5. Communications Security Logistics Activity (CLSA) statement for COMSEC accreditation and availability [2]	X	X	X		CSLA - for Army adopted items NSA - for new items.
	6. TRADOC training assessment (statement of adequacy of institutional training support) (see AR 350–1)	X	X	X		Applicable TRADOC school or other assigned CBTDEV/Trainer/ MATDEV/SEC can address.
	7. Software Suitability Statement (normally provided by Software Engineering Center of LCMC).	X	X	X		USAMC MSC (LCMC) certifying activity (SEC, SED, and so forth)
	8. Quality, reliability, and maintainability statement	X	X	X		Applicable MATDEV/PM/SM
Supportable Support strategy to meet Soldier's requirements	9. Software Supportability.	X	X	X		USAMC MSC (LCMC) certifying activity (SEC, SED, and so forth.
	10. Get-Well Plan		X			Applicable MATDEV/PM/SM
Other	11. Acceptance Statement [3]	X	X	X	X	Applicable

Legend for Table 4-6:
F=Full; C=Conditional; D=Database/Dataset; E=Emergency, X=Required

Notes:
[1] Statements/certifications are required as applicable, and are agreed upon between the PM and approval authority.
[2] The CSLA COMSEC statement is not required when the materiel does not contain standalone COMSEC devices and supporting materials.
[3] End result is approval memo signed by appropriate SEC/Command after the PM provides all of the required documentation, including PM Acceptance Statement.

4–7. Materiel release conditions and conditional materiel release actions

a. Materiel release conditions are shortfalls that affect safety, suitability, and supportability that preclude a system from achieving a full materiel release per the criteria described in tables 4–1, 4–2, and 4–3. Materiel release conditions are identifiable, correctable, measurable and tie to stated requirements.

b. Before a materiel condition will be accepted (entered into MRTS)—

(1) The PM will lead an IPT with all stakeholders to resolve each condition.

(2) Unresolved issues from the IPT will be provided with a recommendation (get well plans) to the Materiel release authority for approval.

c. All get well plan must be coordinated and accepted by the functional authority for each condition. A CMR shall not be approved until all conditions have been accepted and an overall get well plan to achieve FMR has been approved by the MRA.

d. When a CMR is determined, the PM will take the following actions—

(1) Establish an MR get-well plan (see para 4–12*d*) and correct the conditions. Achieve FMR for the materiel within 3 years of CMR approval.

(2) Ensure all conditions in the get-well plan are listed within the MRTS. Categorize conditions according to DA

Pam 700–142. Normal MR procedures will be used to expedite fielding of systems/materiel to meet MTOE authorizations unless the unit is imminently deploying; in this case, UMR policy and procedures will apply.

(3) Restrict CMR to specific quantity, location, and application.

(4) Notify the gaining GC of the issues precluding full release as reported by the functional authority and update the GC whenever the get-well plans are revised.

(a) A GC acceptance statement issued by the GC and signed by or for a general officer or civilian equivalent will accompany a concurrence of a conditional release. (A system scheduled for a conditional release without an urgency of need statement, signed by or for a general officer or civilian equivalent, will not be approved for MR.)

(b) Correction of faults and subsequent FMR of systems does not relieve the PM of the requirement to correct deficiencies in systems previously conditionally released. Consequently, there may be similar systems in the field simultaneously, some under a conditional release and some under a FMR.

(c) Identify and establish mitigating controls in the get-well plan for identified safety hazards not meeting the requirements for FMR.

(5) For systems containing explosives—

(a) Certify all safety requirements have been met or mitigated, as determined by the supporting Safety Office.

(b) Do not preposition, move, or ship the explosive component to a GC until all safety requirements have been met. This includes EOD supportability statement, safety confirmation, and a DOD final hazard classification (FHC). If the FHC is not complete, an IHC can be assigned provided the IHC authority is satisfied that the sponsoring organization is actively pursuing the FHC (see TB 700–2 for additional considerations).

(6) Obtain approval by the MRA or the MRA's designated representative for any changes to get-well dates of conditions in the MRTS. The designated representative will be no lower than the grade of colonel or civilian equivalent. Once approval is obtained, the GC will be notified of the approval and change in the get-well date. A refusal by the GC to accept the change or failure to convince the MRA to approve the extension may result in revocation of release approval. This would require an immediate suspension of the materiel and preclude further release actions until the condition is corrected.

(7) To close a condition—

(a) Obtain concurrence from the functional authority for closure.

(b) Provide the MR coordinator with a copy of the concurrence.

(c) Request the MR coordinator close the condition and update MRTS to reflect the condition closure.

e. When all CMR materiel has been pulled from the field or replaced by a new item, take the following actions:

(1) Notify the MR authority that the item has been pulled from the field or replaced.

(2) Remove the materiel from the MRTS as an actively managed CMR.

f. An amended CMR may be authorized when additional quantities of the system are to be fielded, or another unit or location is to receive the system provided that the conditions preventing FMR have improved or remain the same. If conditions have worsened, a new CMR shall be pursued.

4–8. Conversion of conditional materiel release to full materiel release

a. Take the following actions when MR conditions prohibiting FMR have been corrected:

(1) The PM will ensure a MSR is submitted using SLAMIS to reclassify the item TC STD when an item was previously type classified as LP and now meets TC STD requirements.

(2) The MR coordinator will—

(a) Upgrade MRTS to reflect a status change from CMR to FMR.

(b) Supply a memorandum to the PM, the MRA, and agencies/organizations identified in paragraph 4–12*e*(1) through 4–12*e*(9) documenting that the system is now recommended for an FMR.

b. The PM may convert a CMR to FMR when the MR conditions are determined to be acceptable after attempts to follow get-well plans have failed or are no longer applicable. Convert a CMR to FMR when—

(1) The materiel meets applicable safety requirements and has acceptance of associated risks for residual hazards properly documented in accordance with AR 385–10.

(2) The MRA determines—

(a) The limiting condition cannot be eliminated.

(b) The system receive a FMR as currently fielded.

(3) The PM will attain written agreement from the using command.

c. Upon closure of all conditions—

(1) MR coordinator will—

(a) Convert the CMR to FMR.

(b) Make appropriate changes in the MRTS, accordingly.

(2) PM will notify the supporting and using commands.

4–9. Urgent materiel release—operational need

The UMR of materiel (including software) is intended solely to meet an operational need of a deployed or imminently deploying force in support of approved operational contingencies. Restrict UMR to specific quantity, location and application.

a. Urgent materiel release procedures may be used for type-classified and non type-classified systems/materiel, to include rapid equipping force, joint improvised explosive device defeat organization, joint concept technology demonstration, and advanced technology demonstration equipment authorized to be deployed with the using unit.

b. Do not use UMR policy and procedures as a means to meet budgetary obligations, recover schedule slippages, accelerate materiel fielding, provide early opportunities to field units for training or testing, or to circumvent the normal MR policy.

c. Materiel released under the UMR procedures will remain under the control of the GC for the duration of the operation unless otherwise stated in the UMR authorization.

d. Provide the documentation listed in table 4–7 to certify completion of the required activity and submit the information to the MRTS and SLAMIS to document a UMR action.

Table 4–7
Urgent materiel release documentation requirements

	Required documentation	Description
1. a. User Requested	—Joint Urgent ONS[1](JUONS) *or* —A written request signed by a general officer or civilian equivalent within the gaining unit's chain of command *and*	—Prepared by COCOM and coordinated with Joint Staff —Prepared by unit commander and endorsed by chain of command.
	—DCS, G–3/5/7 ONS validation memorandum *or* —DCS, G–3/5/7 directed requirement memorandum (ATTN: DAMO–CIC or DAMO–AOC)	—Will take the form of either an ONS validation memo or message traffic prepared by DCS, G–3/5/7 (DAMO–CIC or DAMO–AOC) communicating results of the Army Requirements and Resourcing Board.[2, 3]
1.b. HQDA Directed	—DCS, G–3/5/7 approved capabilities documents (for example, ORD, ICD, or CPD) *and*	—Capability has been approved by HQDA, DCS, G-3/5/7. • Pre FRP phase. • MR activities not complete. • Capability needed urgently by field
	—DCS, G–3/5/7 directed requirement memorandum (ATTN: DAMO–CIC or DAMO–AOC)	—Will take the form of either a directed requirement memorandum or message traffic prepared by DCS, G–3/5/7 (DAMO–CIC or DAMO–AOC) directing the fielding of equipment that has not been materiel released
2. A SHDS with a risk assessment for the materiel system		Prepared by the safety office summarizing all known safety and health hazard issues and their mitigation plans.[4, 5, 6]
3. An airworthiness statement, if applicable.		See AR 70–62.
4. An EOD supportability statement from the AMC EOD staff officer, if applicable		Confirms EOD support and/or coverage for the UMR action, if applicable.
5. PM Request for acceptance from the GC/requestor.		This statement will notify the GC/requestor of all known equipment, supportability and sustainment issues. This statement must include all known environmental, safety and occupational health hazards, operational and support limitations to include interoperability limitations and use restrictions.[7]

Table 4–7
Urgent materiel release documentation requirements—Continued

Required documentation	Description
6. GC acceptance statement	The GC/requestor's acceptance statement, signed by a general officer or civilian equivalent [6]

Notes:

[1] Joint urgent ONS do not require DCS, G–3/5/7 validation. Validation of JUONS will normally be done by the Joint Staff POC listed in the JUONS.

[2] The Equipment Common Operating Picture database and directed requirement memo will include the system/materiel quantity, gaining unit, geographic location, application, and destination's point of contract information to facilitate the UMR action.

[3] DCS, G–3/5/7 validation is not required if the unit is already authorized the equipment on their MTOE. An approved DCS, G–3/5/7 basis of issue that has not been applied to the MTOE will also serve as valid authorization and not require a separate a DCS, G–3/5/7 validation.

[4] Review the safety office assessment when configuration changes are made, when the operational mission profile is changed, when an operational safety incident occurs or at least annually to reassess any safety risk. The dates of reviews and/or reassessments will be entered and tracked in the MRTS.

[5] Coordinate the health hazard assessment with CHPPM and the safety confirmation with ATEC.

[6] Prepare and coordinate an SSRA for acceptance of safety risks by the GC for any residual safety risks.

[7] Review the materiel for interoperability certifications such as AIC and DIACAP. Complete required certifications within 1 year of UMR in accordance with CIO/G–6 guidance.

e. The DCS, G–3/5/7 (DAMO–CI), in coordination with TRADOC and ATEC, will determine if systems/materiel (including software) fielded to support urgent requirements have broader application within the U.S. Army.

(1) If a broader application within the Army is determined, the DCS, G–3/5/7 will provide guidance to—

(a) TRADOC to initiate or modify and document the requirement in an appropriate JCIDS capability document (for example, CDD/CPD) and authorization documents.

(b) ASA(ALT) to establish a program of record. An assigned PM will—

1. Continue system development.

2. Type classify the materiel TC–STD.

3. Complete all actions to achieve FMR.

(c) MRA to review materiel for FMR and to properly document (materiel release office performs for MRA) within MRTS.

(2) If the DCS, G–3/5/7 determines that this is a niche capability, (niche capabilities are those proven capabilities that are required by deployed commanders in support of current global war on terrorism operations, but determined not to be required capabilities across the U.S. Army at large), then the DCS, G–3/5/7 will provide guidance to—

(a) Combatant commands to pursue a FMR.

(b) MRA to review materiel for FMR and properly document within MRTS.

(3) If the DCS, G–3/5/7 and GC agree that there is no longer an operational need, the DCS, G–3/5/7 will—

(a) Provide guidance to ASA(ALT) to terminate and withdraw the system/materiel. The ASA(ALT) will direct the PM to provide appropriate disposition instructions to properly retrograde and dispose of the materiel.

(b) Notify the MRA to direct the MR coordinator to close the UMR once materiel has been disposed of.

(4) The determination for further applicability must be supported by a GC evaluation sheet in accordance with DA Pam 70–3.

f. Systems and software requiring interoperability certification, such as AIC and Joint interoperability certification by the Joint Interoperability Test Command will undergo an initial interoperability analysis by Army CIO/G–6 to identify shortfalls and limitations.

(1) Urgent materiel release approval does not exempt the system from the requirement to obtain AIC.

(2) The system AIC requirements must be completed within established timeframe of obtaining the UMR or the system may be subject to removal from the field.

g. Distribution of UMR items will be to the lowest level possible to alleviate unnecessary handling and break down of materiel by the combatant command. Handoff will be at the company level unless modified and approved by combatant command and contained in the MR approval.

(1) Shipment of items to the combatant commander will be coordinated with the AFSBs.

(2) The operational situation may dictate that the system/materiel being released to a unit under UMR remain deployed in a theater of operations as the unit rotates out and another unit rotates to replace them.

(a) Accountability for this theater provided equipment will initially be established with the AFSBs and responsibility transferred from unit to unit as governed by AR 710–2.

(b) Inter-theater transfers are prohibited unless approved by the DCS, G–8.

(c) The PM will notify the appropriate MR coordinator of any change of ownership in order to update the MRTS. In these cases, a change of ownership does not constitute a new MR action.

h. Follow-on UMRs may be authorized following MR authority approval of the initial UMR, when either new

quantities need to be fielded to another GC or when additional (plus-up) quantities need to be fielded to a previous fielded GC.

(1) When new quantities need to be fielded to another GC, the follow-on UMR may use the support statements for the initial UMR, provided these statements are reaffirmed by their proponents, and the GC has supplied user acceptance.

(2) Additional quantities may be issued to a GC that has previously supplied user acceptance without the need for additional supporting statements, provided that all known safety and health hazards, operational and support limitations, to include interoperability limitations, and use restrictions have improved or remain the same since the initial UMR.

(3) In either case, the systems will be issued under an addendum memorandum by the LCMC MR coordinator and the MRTS will be updated accordingly.

(4) If the system changed and/or any known safety and health hazards, operational and support limitations, to include interoperability limitations, and use restrictions have been affected, a new urgent release must be pursued with appropriate documentation from all support agencies/activities.

4–10. Training materiel release

This is the release of materiel to a training organization. A TMR will be issued only for materiel fielded to TRADOC/Army Command (ACOM) schools and TRADOC/ACOM training sites and is not to be used for special-development programs released under a hand receipt (see para 4–13). A TMR allows materiel to be given to trainers so that course curricula can be developed and students can be trained. MR for training may include prototype or test materiel, materiel manufactured under conditions other than normal production, materiel that is incomplete (major components missing or defective), and/or materiel where one or more of the requirements for FMR have not been met. Before TMR approval, the PM will ensure that selected MR activities such as safety (tables 4–1, 4–2, and 4–3 activities 1–16), availability of spare/repair parts, technical documentation, responsibility for maintenance support (tables 4–1, 4–2, and 4–3 activities 26, 27, 29, and 32), and the other conditions that limit the use of the materiel (tables 4–1, 4–2, and 4–3 other activities as required) will be identified and accepted by the trainer (tables 4–1, 4–2, and 4–3 activity 23). The functional authority shall tailor the required activities based upon the scope of the training materiel and will use criteria from tables 4–1, 4–2, and 4–3 to evaluate the activities. The PM may tailor the criteria outlined in tables 4–1, 4–2, and 4–3 with the consent of the functional authority for the activity. A TMR procured against capabilities documents will be released under the FMR or CMR procedures specified above. Providing materiel to using units who will train with that equipment as part of their mission requires a full or conditional release. All TMRs will be entered into the MRTS (see para 4–12).

4–11. Prepostioning of materiel

Materiel proposed for release will remain under the control and accountability of the PM until release approval is granted.

a. Materiel may be prepositioned before MR is approved, with the approval of the MR authority, MDA, GC, and IMCOM garrison commander.

b. The lead PM is responsible for all costs associated and incurred by the GC and IMCOM garrison with respect to prepositioning of equipment/materiel.

c. Prepositioning materiel does not imply permission to hand off materiel to GC.

d. The MRA may delegate the approval of follow-on prepositioning actions.

e. A limited amount of assets may be transferred for the purposes of ceremonies and demonstrations without MRA approval; however, upon conclusion of the ceremony or demonstration, the assets must be returned and processed under the formal MR effort.

f. Security requirements for property control and accountability must be identified.

4–12. Materiel release tracking system

The applicable MRA will use the AEPS MRTS to create, maintain, track, and report all MR actions/activities.

a. The MRTS contains the following

(1) All MR actions that have been approved since April 2000.

(2) Major or significant systems, at the discretion of the MR coordinator prior to April 2000.

(3) All open conditional releases with applicable get-well plans, regardless of age.

(4) All forecasted releases.

b. At each command, the MR coordinators, in coordination with the PM, are responsible for inputting data into the MRTS, to include all updates and quarterly forecast information. Contact the local MR coordinator for more information on AEPS. The MRTS is at https://aeps.ria.army.mil and requires a logon identification and password.

c. Begin forecasting when the program reaches MS C or 24 months prior to FRP date.

d. A get-well plan is required for all systems under CMR and lists each condition that precluded an FMR. The plan includes each issue to be resolved, the interim solution, the projected get-well date for each of the conditions, and the

projected date for the FMR when all conditions are eliminated. In addition, it identifies the functional authority (the originator or an agency designated by the originator) to certify when the condition is corrected. All issues will be assigned a category (see DA Pam 700–142). Only conditions in the get-well plan will be reviewed when converting from CMR to FMR.

e. A copy of each approved MR memorandum/document will be posted to the MRTS at http://aeps.ria.army.mil, and the following will be notified:

(1) ASA(ALT) (SAAL–ZL, SAAL–ZB).
(2) ASA(I&E).
(3) Commander, AMC (Operations–FAM).
(4) DCS, G–4 (DALO–Z).
(5) DCS, G–3/5/7 (DAMO–FMR).
(6) CIO/G–6 (SAIS–GK).
(7) DCS, G–8 (DAPR–FD).
(8) Commander, ATEC (CSTE–DCSOPS/ADMIN).
(9) Commander, TRADOC (ATBO–HS).

4–13. Tests, demonstrations, and training

The PM will not issue materiel without an approved MR to Soldiers in the field except for use in an approved test, special user demonstration/evaluation (to include advanced warfighting experiments, advanced technology demonstrations, joint concept technology demonstrations, mission-readiness exercises, required home station training, and predeployment training and exercise), or training program.

a. The PM may use hand receipts (see AR 710–2) for the duration of the test program, demonstration/evaluation, or training mission. If units are tasked to deploy with equipment provided for test, demonstration, and training, follow UMR procedures outlined in paragraph 4–19.

b. Normally the materiel will revert to PM control after completion of the testing, demonstration/evaluation, or training unless DCS, G–8 authorization is obtained for the using unit to retain it. In this case, the GC accepts the system "as is" and provides its own support.

c. When the test, demonstration, or training program is over, the PM must pursue an MR action in order to allow the system to remain in the field in accordance with this policy.

d. The PM will provide disposition instructions for the materiel in the event the equipment is not to be retained by the unit.

e. At a minimum, a safety release from ATEC is required for all hand-receipted materiel. When the using unit is to retain the equipment after a test, demonstration/ evaluation, or training exercise, a safety confirmation is issued in lieu of a safety release.

4–14. Materiel release of evolutionary acquisition programs

Materiel that is developed under the evolutionary acquisition strategy will receive a FMR when all requirements for the increment are met. (Each increment should have its own MR.) Otherwise, a CMR will be used for that increment.

Chapter 5
Materiel Fielding

Section I
Materiel Fielding Process and Documentation

5–1. Purpose

a. Materiel fielding is the process of planning, coordinating, and executing the deployment of a materiel system and its support. Success comes from advance planning, coordination, and agreement between the materiel developer and the GC. The process of materiel fielding is designed to achieve an orderly and satisfactory deployment of a materiel system and its initial support, beginning with the first unit equipped (FUE) and extending until initial deployment to all units is completed.

b. Entrance criteria for materiel fielding include TC, MR, DA authentication of technical manuals in accordance with AR 25–30 and completion of all residual actions required in the FRP ADM.

c. The TPF is the Army's standard fielding process used to field Army systems, except as outlined in paragraph 5–14.

d. Materiel fielding starts with initial supportability planning as documented in the SS (previously known as the integrated logistics support plan) at program initiation. Beginning with early recognition of fielding requirements, constraints, and resource impacts, it evolves into detailed planning and coordination in the system development and

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TAB 66

encl 1_Camden Launcher Incident.txt

From: [redacted]
Sent: Thursday, September 21, 2000 5:43 PM
To: [redacted]
Subject: FW: A1 launcher problem
Importance: High

Forwarded for your information.

From: [redacted]
Sent: Thursday, September 21, 2000 4:33 PM
To: [redacted]
Subject: A1 launcher problem
Importance: High

On September 21, 2000 a failure occurred on A1 launcher s/n 11 that had not been seen on previous launchers in Camden. The details surrounding the failure are noted below.

The launcher was in the "Final Functional" stage of test and had just completed a series of offloads at Tactical speed. The operator commanded manual boom at the Fire Control Panel. The cage cleared the stow socket at tactical speed and positioned itself directly behind the cab. A second operator pressed the "UP" button on the Manual Boom Controller and the cage proceeded upward at maintenance speed. The button was released at approximately 100 mils and a 3rd operator moved to the side of the launcher to install a safety strut. As he was positioning the strut to install the pin through the cage and the upper portion of the strut, the cage began moving downward at tactical speed. The operator moved away and the cage continued it's travel until it contacted the stow pads. The LDS remained on and the Travel Lock Hooks did not close. In an effort to unload the cage and turret from it's stow position, the up button was pressed and the LDS shutoff.

The failure data retrieved from the Fire Control Panel is as follows:

CBIT revealed an unknown status for the LIU. All other LRUs passed.
LDS Status showed "Partial inoperative".
Ambiguity groups BC, BJ, BK and DA were highlighted.
Selecting LIU CBIT at the lower left hand portion of the screen revealed LIU LRU - unknown, LDS Controller - unknown, LDS Status - failed.

The fault log showed a "critical failure at 01:33". The fault code was 3661 "Predicted Elev Resolver" BC.

After retrieving all fault log data the Fire Control System was shut down and re-booted. The operations described above were re-run with no anomalies.

This is not the first occurrence for this failure. The Design/Software group has seen this on at least 4 previous occasions but has been unable to recreate the failure with test equipment in place to identify the cause.

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TAB 67

M270A1 SAFETY BULLETIN

LOCKHEED MARTIN

M270A1 OPERATIONAL RECOMMENDATIONS FOR PERSONNEL SAFETY

Prepared
[redacted]
Safety Engineer M270A1

Reviewed
[redacted]
Manager M270A1 LRIP

Reviewed
[redacted]
Manager, System Safety
& Human Factors

Approved
[redacted]
Director, Launcher Modernization/
Army TACMS Production

M270A1 SAFETY BULLETIN LOCKHEED MARTIN

OPERATIONAL RECOMMENDATIONS FOR PERSONNEL SAFETY

1. While M270A1 publications give no specific guidance on the subject, all personnel must remain outside the zero-elevation slewing radius of the LLM when the launcher engine is running, regardless of whether the launcher drive system (LDS) is engaged. This applies equally for operations in the tactical or maintenance speed modes. No person shall be on the launcher when the engine is running, regardless of the LDS engagement status unless approved operations such as, RP latch activity, SNVT check, Boom Controller stowing / retrieval, etc. are in progress.

2. If maintenance speed / manual boom control is being utilized, two operators must simultaneously control the launcher. One operator will operate the manual boom controller. Should an emergency stop be required, simultaneously pressing two buttons on the boom controller, in any combination will stop the system (unless it is in a runaway condition). Another operator must be in the cab during all operations, where releasing the brake would also disengage the LDS pump, thus stopping the system.

3. Use of jury struts

Struts must always be used in pairs. The only period that the launcher should ever have only a single strut installed is the time it takes to install the second strut. No person shall be under the cage with only a single strut installed, regardless of whether the LDS and / or engine are running.

Jury struts shall not be installed when the LDS and / or engine are running. Not only does this constitute a personnel hazard, but also can cause launcher damage. Severe damage would likely occur if the elevation system activates or is activated during the brief period where only one strut is installed. In the single strut case; it is possible that a component of the elevation drive system could be overloaded and fracture, allowing the entire LLM to fall.

The launcher engine shall never be started with the jury struts installed unless required by approved maintenance or troubleshooting procedures.

4. Specific instructions for the installation of the jury struts are as follows:

Enable boom controller for maintenance.

Using boom controller, raise the LLM to an elevation to clear the engine compartment. Position the LLM in azimuth for the required position.

Position the LLM in elevation to approximately 375 mils as indicated on FCP to allow room to connect struts.

WARNING
PERFORM SHUTDOWN OF THE FCS AND TURN OFF ENGINE BEFORE PROCEEDING

Line up hole in clevis on upper end of strut with hole in LLM.

Press and hold release button on the quick release pin. Insert quick release pin through the clevis and LLM. Release button when pin is all the way through clevis and LLM.

WARNING
VERIFY THAT PINS ARE LOCKED IN PLACE BEFORE PROCEEDING

Line up holes in clevis at lower end of strut with hole in turret. Struts may be shortened or lengthened to line up holes by turning barrel of struts.

Press release button on quick release pin and insert quick release pin through clevis and turret. Release button when quick release pin is all the way through clevis and turret.

WARNING
VERIFY THAT PINS ARE LOCKED IN PLACE BEFORE PROCEEDING

NO PERSON SHALL BE POSITIONED WITHIN THE RANGE OF CAGE TRAVEL WHEN THE LDS IS ON.

NO PERSON SHALL BE POSITIONED UNDER THE LLM WITHOUT APPROVED SAFETY STRUTS INSTALLED AND THE LDS AND ENGINE TURNED OFF.

WHEN INSTALLING SAFETY STRUTS, THE LDS MUST BE OFF BEFORE INSTALLING THE PINS IN THE STRUT. AT NO TIME SHALL THE OPERATOR INSTALL A SAFETY STRUT WHILE THE LDS IS RUNNING.

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TAB 68

Lockheed Martin Missiles and Fire Control - Dallas
P.O. Box 650003 Dallas, TX 75265-0003
Telephone 972-603-1000

LOCKHEED MARTIN

3-19210/2000L-5427 20 November 2000

To: Commander
U. S. Army Aviation and Missile Command
Redstone Arsenal, Alabama 35898-5000

Attn: AMSCAM-AC-TM-C[redacted] PCO

Subj: Contract DAAH01-98-C-0138, M270A1 Launcher Upgrade-
LRIP 1& 2 Launcher Sales

1. Lockheed Martin Corporation Missiles and Fire Control - Dallas (hereinafter referred to as Lockheed Martin) herewith documents an agreed to approach to resume M270 Launcher Sales. Three M270A1 Launchers completed in October were voluntarily not presented for sale due to a safety issue that surfaced in late September.

2. A Lockheed Martin Tiger Team was formed to investigate the uncommanded cage movement (a safety issue) and excessive piston shoe wear (a motor problem). LTC Myrick, the Project Office, and representatives from the User and Tester committees were briefed on the status of this investigation on 26 October.

3. Launcher S/N 1048, which experienced the uncommanded cage movement, was brought to LMMFC-D for testing. After twenty plus hours of intensive testing, the anomaly has not been repeated. Forty-five possible root causes have been identified. A Safety Bulletin was published for Operational Recommendations for Personnel Safety while using the manual boom control.

4. The following system software changes will be FQT'd by 21 December 2000:

   - To enhance reliable operations
     - Improve an algorithm that compensates for missing turns count in motor position resolver output
     - Improve an algorithm that responds to flow limited conditions in the hydraulic system
   - To enhance system safety features in M270A1 LIM:

- Improve exception handling in both motor and cage control tasks
- Apply brakes immediately when two buttons are depressed simultaneously on the boom control.

5. System Safety will be enhanced by implementing an operator activated "over current kill switch" built into the boom controller. The priority for installing the modified boom controllers will be in launchers used for training and ESIT, followed by the launchers for OT, then delivered LRIP launchers.

6. Six additional safety features will be implemented in the system software prior to OT. The User-suggested expanded use of an existing software function to automatically position the cage for strut installation. The investigation into the root cause of the uncommanded cage motion will continue.

7. Analysis and testing of the Azimuth Control Motor indicates that excessive piston shoe wear was shuddering the system, while the cage was operating at maintenance speed. A notch filter was developed for the System Software to eliminate the shuddering. This change will be in the system software. When accomplished, the new System Software will be implemented at the production facility in Camden. The investigation will determine if anything else contributed to the piston shoe wear.

8. All Azimuth Control Motors in delivered M270A1 Launchers will be retrofitted after the final conclusion is made on the piston shoe wear at no additional cost to the Government.

9. Therefore, based on the above discussions with the MLRS PMO, Lockheed Martin plans to resume sale of six (6) M270A1 launchers for November and the three (3) M270A1 launchers for December. It is requested that these launchers be shipped "in place" at Camden, Arkansas. In December these launchers will be retrofitted with the initial System Software changes. Delivery to Red River Army Depot will be accomplished after the System Software update.

10. Lockheed Martin requests your review and concurrence for the sale of M270A1 Launchers at Camden under these conditions in order to resume sales in November 2000.

11. Should you have any questions concerning this matter, please contact the undersigned at (972) 603-1102 or Mr. Jimmy J. Crouch at (972) 603-0454.

[redacted]
Financial Manager—Fires Support Programs

cc: AMCOM/AMSAM-AC-TM-C[redacted]
SFAE-MSL-ML-MG[redacted]
DCMC Lockheed Martin[redacted]ACO

TAB 69

DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION & MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA 35898-5280

REPLY TO
ATTENTION OF
Acquisition Center, MLRS Division

29 November 2000

Lockheed Martin Vought Systems
[redacted] – MLRS Production Contracts
P. O. Box 650003
Dallas, Texas 75265-1000

Dear [redacted]

Please reference Lockheed Martin Vought Systems Letter 3-19210/2000L-5427, Subject: Contract DAAH01-98-C-0138, M270A1 Launcher Upgrade-LRIP 1&2 Launcher sales.

In response to the above referenced letter, it is the Government's position that all potential root causes for the uncommanded cage movement and excessive piston shoe wear have yet to be determined. The Government will conditionally accept the six launchers scheduled for delivery for the months of October 2000 and November 2000 under the conditions stated in your letter as well as the following conditions.

- Research is continued to determine the exact cause of the uncommanded cage movement and excessive piston shoe wear at no additional cost to the Government.
- Repairs and solutions are developed for all 45 identified potential causes and any others that arise during the course of the research. Developed repairs and solutions for the uncommanded cage movement and excessive piston shoe wear are to be applied to all M270A1 launchers previously delivered and those yet to be delivered at no additional cost to the Government.
- Shipment of these launchers will be in place.
- Acceptance of December 00 M270A1 launchers will be contingent upon continued adherence to the FQT schedule and the development and provision to the Government of an acceptable retrofit schedule.

If you should need further information please contact the undersigned at (256) 876-4588.

Sincerely,

Major, Ordnance
Contracting Officer

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TAB 70

70A

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY
	A	

D. SYSTEM/ITEM	E. CONTRCT/PR NO.	F. CONTRACTOR
M270A1 LRIP 3		LMMFC-D

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A001	SAFETY ASSESSMENT REPORT (SAR)	

4. AUTHORITY (DATA ACQUISITION DOC NO.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-SAFT-80102 A	Attch 1, SOW Para 7.1	AMSAM-SF

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQ	12. DATE OF FIRST SUB
LT	D	BLK 16	BLK16
8. APP CODE		**11. AOD**	**13. DATE OF SUBSEQ SUB**
A		N/A	BLK16

16. REMARKS

Block 9: (A) Distribution Statement D. Distribution authorized to the DOD and U.S. DOD contractors only; REASON: Administrative or operational use; DATE OF DETERMINATION: 15 Sep 95. Other requests shall be referred to U.S. Army Aviation and Missile Command, ATTN: AMSAM-SF, Redstone Arsenal, AL 35898-5700.

Blocks 8, 10, 12 & 13: Submit SAR 270 DAC to address required safety program, safety assessment and hazard analysis efforts. Update SAR with change pages for significant design changes. Government comments within 30 days. Contractor incorporation of comments in a revision within 30 days.

(B) Export Control Act Warning: REQUIRED.
See CDRL continuation sheet for "Export Control Act Warning"

Block 14: Electronic delivery of the data item is required and shall be in accordance with Section H-6 - ELECTRONIC SUBMISSION of this contract. The data item shall be delivered in one or more of the MS Office document formats, HTML or PDF.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
SFAE-MSL-ML-CM	1	1	0
15. TOTAL -->	1	1	0

[redacted]

AMSAM-RD-SE-TD-DM CO[redacted]
LOG# 000159 NO. P[redacted] 32 DI NO. A001 THRU A032
NO. LINE ITEM 32 DATE 23 Jun 00

G. PREPARED BY	H. DATE	[redacted]	J. DATE
[redacted]	23 Jun 00		23 Jun 00

17. PRICE GROUP	18. ESTIMATED TOTAL PRICE	Page 1 of 33 Pages

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The Government shall have access to the contractor's internal data IAW DI-MGMT-81453. Copies of such data shall be submitted upon request.

6.8 Delivery of Engineering Data

The media delivery requirements of engineering data, and all other data that forms a part of the PBL shall be as stated in MIS-52406.

7.0 SYSTEM SAFETY

7.1 Safety Assessment Report (SAR)

A comprehensive SAR shall be prepared for the M270A1 IAW DI-SAFT-80102 that incorporates the safety assessment efforts conducted under the ILMS and IFCS programs. The M270A1 SAR shall summarize the combined safety programs, tasks and activities, and describe all design safety requirements, features, functions and characteristics of the hardware and applicable launcher software. All safety hazards and risks associated with the M270A1 configuration that were identified during development and testing shall also be documented along with any procedural hazards, controls and precautions required for tactical and training launcher operation/maintenance. System, Subsystem, Software and Operating and Support Hazard Analysis shall be performed and/or updated on the changes from the Basic M270 to the M270A1 Launcher configuration, with emphasis on safety critical components and functions, and the results incorporated into the SAR.

7.2 Safety Impact

All ECPs, RFDs, and RFWs shall be reviewed to determine their affect on system safety and an impact statement with analysis/evaluation included in each.

8.0 PRODUCTION ENGINEERING

8.1 Manufacturing Planning

The contractor generated, maintained, or implemented manufacturing planning documentation necessary to support the required production activities shall be available for Government review.

9.0 INTERIM CONTRACTOR SUPPORT (ICS)

9.1 Definitions

M270 Common Items - All components and hardware, which are used in both the M270 Launcher, APN 13029700-203 and the M270A1 Launcher, APN 13213300.