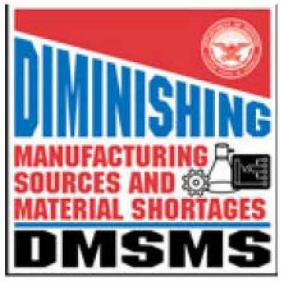
EXPEDITIONARY FIGHTING VEHICLE

DIMINISHING MANUFACTURING SOURCES AND MATERIAL SHORTAGES (DMSMS) MANAGEMENT PLAN

CDRL S066, Revision 05-00



DIRECT REPORTING PROGRAM MANAGER
ADVANCED AMPHIBIOUS ASSAULT
WOODBRIDGE, VA 22192

Date: 1 June 2005

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
01 JUN 2005		**00-00-2005 to 00-00-2005**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Expeditionary Fighting Vehicle Diminishing Manufacturing Sources and Material Shortages (DMSMS) Management Plan	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Direct Reporting Program Manager,Advanced Amphibious Assault,Woodbridge,VA,22192**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

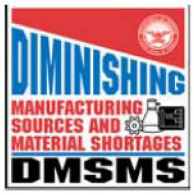
14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**60**	

EXPEDITIONARY FIGHTING VEHICLE

DIMINISHING MANUFACTURING SOURCES AND MATERIAL SHORTAGES (DMSMS) MANAGEMENT PLAN



1 JUNE 2005

Prepared By:
GENERAL DYNAMICS AMPHIBIOUS SYSTEMS
DIMINISHING MANUFACTURING AND MATERIAL SHORTAGES IPT
14041 WORTH AVENUE
WOODBRIDGE, VIRGINIA 22192

Prepared For:
DIRECT REPORTING PROGRAM MANAGER
ADVANCED AMPHIBIOUS ASSAULT
14041 WORTH AVENUE
WOODBRIDGE, VIRGINIA 22192

DMSMS MANAGEMENT PLAN

APPROVAL SIGNATURE AND DATE

Approved:_____ **Date:**_____
Colonel Michael Brogan, Direct Reporting Program Manager, Advanced Amphibious Assault

Prepared:_____ **Date:**_____
Dr. Bob Berkowitz - EFV DMSMS Management Team Chair

Prepared:_____ **Date:**_____
Mr. Dave Rowlands - EFV DMSMS Management Team Vice Chair

Reviewed:_____ **Date:**_____
Mr. Harry Oldland - EFV DMSMS DRPM C-Platform Lead

Reviewed:_____ **Date:**_____
Mr. Marc Paquette - EFV DMSMS P-Platform Lead

Reviewed:_____ **Date:**_____
Mr. Dave Restifo - EFV DMSMS Logistics Lead

Reviewed:_____ **Date:**_____
Mr. Chris Ribble - EFV DMSMS Program Integration Agent C-Platform Lead

Reviewed:_____ **Date:**_____
Mr. Darrell Duszka - EFV DMSMS Program Integration Agent P-Platform Lead

Reviewed:_____ **Date:**_____
Mr. Duane Foglesong - EFV DMSMS Program Integration Agent Logistics Lead

RECORD OF CHANGES

Change Number	Date	Title or Description	Enter by

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

The Direct Reporting Program Manager, Advanced Amphibious Assault (DRPM AAA), is responsible for the total life cycle of the Expeditionary Fighting Vehicle (EFV) and embraces Performance Based Logistics (PBL). One of the tenants of PBL through the implementation of Total Life Cycle Systems Management (TLCSM) is to identify and mitigate Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues, so that the highest levels of operational readiness can be developed, produced, fielded, and sustained by the combined forces.

This document highlights the EFV DMSMS program. ***The EFV DMSMS program is fully responsive to the requirements promulgated in Assistant Secretary of the Navy for Research, Development and Acquisition ASN(RDA) memo of 27 Jan 05 and Navy Supply Organization (NAVSO) P-3692, Independent Logistics Assessment (ILA), for a pro-active DMSMS program.***

This document is organized as follows:

Section 1, Introduction, provides the background history of the DMSMS program to the EFV program.

Section 2, References, identifies the standards, processes, and other supporting documents which comprise the guidance and direction related to EFV DMSMS management.

Section 3, System Description, provides a technical overview of the EFV personnel and command variants as well as a schedule of their procurement and deployment profiles.

Section 4, EFV DMSMS Management Team (DMT), discusses the EFV DMT policy, mission, DMSMS IPT, and organizational roles and responsibilities.

Section 5, Management, highlights how DMSMS is pro-actively managed as part of the EFV systems acquisition process; the process for development of life cycle cost estimates and Program Objective Memorandum (POM) inputs to plan for mitigation of obsolescence issues; contractual requirements and management oversight to include incentivization, source of supply decision-making, production and industrial base readiness; maximum use of standardization and commonality; and, performance-based DMSMS-related metrics and measures of effectiveness.

Section 6, EFV Technology Roadmap, documents what technology upgrades are planned, their frequency of refresh, and how planned technology upgrades will be used as a obsolescence mitigation strategy.

Section 7, EFV Configuration Management and Bill of Materials (BOM) Management, documents the application of configuration item identification and analysis, parts lists review and prioritization, periodic market assessment, bill of material configuration management, the relationship of the DMT to the Configuration Control Board (CCB), and the approach to forecasting technological changes on vehicle configuration will be managed on the EFV in support of the DMSMS initiative.

Section 8, EFV DMSMS Data Management Architecture, illustrates the tools used for EFV data management and the utility that each application provides to the overall process of mitigating DMSMS risk.

Section 9, EFV DMSMS Process, presents the logic flow from identification and verification of a DMSMS issue through its assessment, documentation, mitigation, and closure.

Appendix A, DMSMS traceability matrix, demonstrates that the EFV DMSMS program is fully compliant to the requirements of ASN(RDA) memo of 27 Jan 05 and NAVSO P-3692 related to DMSMS.

Appendix B is a list of **DMSMS**-related **acronyms**.

Appendix C provides a **glossary** for selected terms and definitions of the EFV DMSMS program.

Appendix D documents the **DMSMS metrics** being collected for pro-active DMSMS management and external liaison and reporting by DRPM AAA.

Appendices E and F provides an overview of the tools implemented as part of the **EFV DMSMS tools suite**.

Appendix G presents the documents being used as **DMSMS case resolution artifacts** by DRPM AAA.

1.0 INTRODUCTION

1.1 Purpose

By direction of ASN(RDA), all Department of Navy (DoN) Acquisition Category (ACAT) Programs, with cognizance over embedded microelectronics, are required to implement a program to mitigate DMSMS arising within their platforms. "Using a predictive, disciplined approach to define, measure, analyze, improve and control DMSMS, programs can improve system availability and significantly reduce DMSMS costs." (Quoted from ASN(RDA) memorandum of January 27 2005.) The Marine Corps EFV uses state-of-the-art microelectronics and DRPM AAA recognizes the inherent value in a sound DMSMS strategy for the EFV.

This Plan establishes a formal DMSMS Plan for all phases of the EFV life cycle with a mandate to manage obsolescence at the piece part level for all active microelectronics and critical material sources. DRPM AAA recognizes its responsibility to manage DMSMS throughout the life cycle of the vehicle; and, to this end, will ensure that PBL agreements address mitigation of DMSMS risk to the program and the government.

This Plan has been prepared in accordance with Department of Defense (DoD) 4140.1-R, Secretary of the Navy (SECNAV) Instruction 5000.2C, ASN(RDA) memorandum dated January 27 2005, Deputy Assistant Secretary of the Navy for Logistics (DASN(L)) memorandum dated April 12 2005, and DASN(L) memorandum dated August 20 2004. Guidance for this Plan was provided by the Draft DoD DMSMS Guidebook dated February 4 2005 and DASN(L)'s DMSMS Management Plan Guidance dated April 2005.

Appendix A shows traceability of the EFV DMSMS Plan to ASN(RDA) memorandum dated January 20 2005 and NAVSO P-3692, ILA Handbook dated December 2003. Acronyms used in this DMSMS Management Plan are given in Appendix B with a glossary of terms and definitions in Appendix C.

This Plan will serve as input to the DRPM AAA Systems Engineering Plan (SEP), DASN(L) ILA, annual POM inputs related to risk mitigation for obsolescence, and, Low Rate Initial Production (LRIP) Production Critical Design Review (CDR). These documents will also support evaluation by the Service Acquisition Agent (SAE) Milestone C Review authorizing the EFV to transition from the System Design and Development (SDD) to the LRIP.

1.1.1 Background

The objectives of this EFV DMSMS Management Plan are reduced total cost of ownership, increased logistics readiness, and increased vehicle availability. These objectives will be realized by:

- Defining a DMSMS management process,
- Incorporating proven DoD DMSMS management practices,
- Developing policies and procedures that will reduce near-term EFV DMSMS impacts,

- Developing approaches throughout the EFV life cycle to mitigate the impact of future, DMSMS issues,
- Defining and qualifying EFV System part listings by mission impact,
- Monitoring program parts lists against available industry data,
- Identifying EFV DMSMS business cases,
- Selecting and recommending optimum solutions to resolve DMSMS cases,
- Implementing approved solutions,
- Integrating with a Technology Roadmap and Scheduled Maintenance/Technology Insertion (SM/TI), and
- Coordinating resolution of EFV DMSMS cases with program technology refresh/insertion plans and approaches, PBL, and TLCSM activities.

2.0 REFERENCES

The following documents have been utilized in the development of the EFV DMSMS program. Several of these documents were developed by the Program Integration Agent (PIA), an International Standards Organization (ISO) 9001:2000 Level 3 certified contractor.

DoD INSTRUCTIONS, STANDARDS, SPECIFICATIONS, MANUALS AND HANDBOOKS

a) DoD 4410.1M, DoD Priorities and Allocation System, 26 May 1995
b) Program Manager's Handbook – Common Practices to Mitigate the Risk of Obsolescence, Dec 2001
c) Secretary of the Navy Instruction (SECNAVINST) 4105.1A, Independent Logistics Assessment and Certification Criteria, 5 Mar 2004
d) DoD 4140.1-R, DoD Supply Chain Material Management Regulation, 23 May 2003
e) SECNAVINST 5000.2C, 19 Nov 2004

OTHER DOCUMENTS

a) General Accounting Office Report, Defense Inventory, DoD Could Better Manage Parts With Limited Manufacturing Sources, Aug 1990
b) Office of the Under Secretary of Defense Memo, DoD's Diminishing Manufacturing Sources and Material Shortages Centralized Data Base, 1 May 1995
c) U.S. Code Title 10, Chapter 131, Section 2213, Limitation on Acquisition of Excess Supplies, 26 Jan 1998
d) Case Resolution Guide, Air Force Material Command DMSMS Program, 31 Mar 2001
e) DMSMS Acquisition Guidelines: Implementing Parts Obsolescence Management Contractual Requirements, Dec 2001
f) Office of the Secretary of Defense, Designing and Assessing Supportability: A Guide to Increasing Reliability and Reducing the Logistics Footprint, Oct 2003
g) NAVSO P-3692, Independent Logistics Assessment Handbook, 30 Dec 2003
h) DASN (L) Memo, DMSMS, 10 May 2004
i) DASN (L) Memo, Evaluation Criteria for DMSMS, 20 Aug 2004
j) DASN(RDA) Memo, Evaluation Criteria for DMSMS, 20 Aug 2004
k) Capability Production Document, 28 Oct 2004
l) Technology Roadmap, Expeditionary Fighting Vehicle, Feb 2005

m) DMSMS Guidebook, 11 Feb 2005
n) DASN(RDA) Program Management Plans and Metrics, 12 Apr 2005
o) PBL: A Program Manager's Product Support Guide
p) Naval Sea Systems Command (NAVSEA) DMSMS Case Resolution Procedures Guide, NAVSEA 0416
q) Defense Microelectronics Activity (DMEA) Case Resolution Report

PIA PROCESSES

a) Program Directive (PD)-1216, Program Downselect of Competing Unfunded Priorities, 18 Jun 2004
b) PD-1086, Risk Management, 31 Jan 2005
c) PD-1256, Obsolescence Resolution, 11 Feb 2005
d) PD-1006, Change Management, 14 Mar 2005
e) PD-1071, Material Acquisition Management, 21 Mar 2005
f) PD-1220, Retrofit Change Management, 7 Apr 2005
g) PD-1066, Create and Process Material Request, 22 Apr 2005

PIA GUIDELINES

a) Guideline (GL)-1090, Priority Code Identification for Logistics Generated Material Request, 21 Apr 2005

PIA STANDARDS (NON-MILITARY)

a) Standard (STD)-1011, Supplier Selection Standard, 28 Feb 2005
b) STD-1013, Price/Cost Analysis of Supplier Proposals, 30 Mar 2005
c) STD-1012, Material Acquisition Approval and Document Requirements for Purchase Orders, 16 Mar 2005

PIA WORK INSTRUCTIONS

a) Work Instruction (WI)-1342, Create Indentured BOM Report, 29 Jan 2004
b) WI-1353, Documenting Parts for Vendor Controlled Assemblies, 2 May 2005

PIA FORMS

a) Form (FM)-1038, Meeting Minutes Form, 5 May 2003
b) FM-1148, Business Case Analysis (BCA), 11 Feb 2005
c) FM-1088, Directive for Use of Specified Source, 1 Mar 2005
d) FM-1152, Certificate of Non-Disclosure, 1 Mar 2004
e) FM-1151, Purchase Order Award Justification, 1 Mar 2004

PIA CHECKLISTS

a) Checklist (CL)-1057, Material Acquisition Documentation Checklist, 16 Mar 2005

DATA ITEM DESCRIPTION

a) Data Item, Miscellaneous (DI-MISC)-80652, Technical Information Report
b) Data Item Management (DI-MGMT)-81117, Technical and Management Work Plan

3.0 SYSTEM DESCRIPTION

The mission of the EFV is to develop and manufacture the replacement for the current Assault Amphibian Vehicle (AAV), AAV7A1. The AAV7A1 has limited capabilities, is becoming less survivable on the modern battlefield and does not meet the operational requirements of future warfighting concepts. The EFV is designed to overcome deficiencies in capability as well as fulfill future operational concept requirements.

The Mission Essential Functions of the EFV are shoot, move, communicate, carry and protect.

The EFV is the only ACAT ID program within the Marine Corps. The EFV program (Figure 3-1) is nearing the end of the SDD phase with entry into LRIP expected in late Fiscal Year (FY)06. Initial Operational Capability (IOC) is planned to occur in FY10. Production of 1,013 vehicles is planned to continue through FY20 with a service life expected through at least FY50.

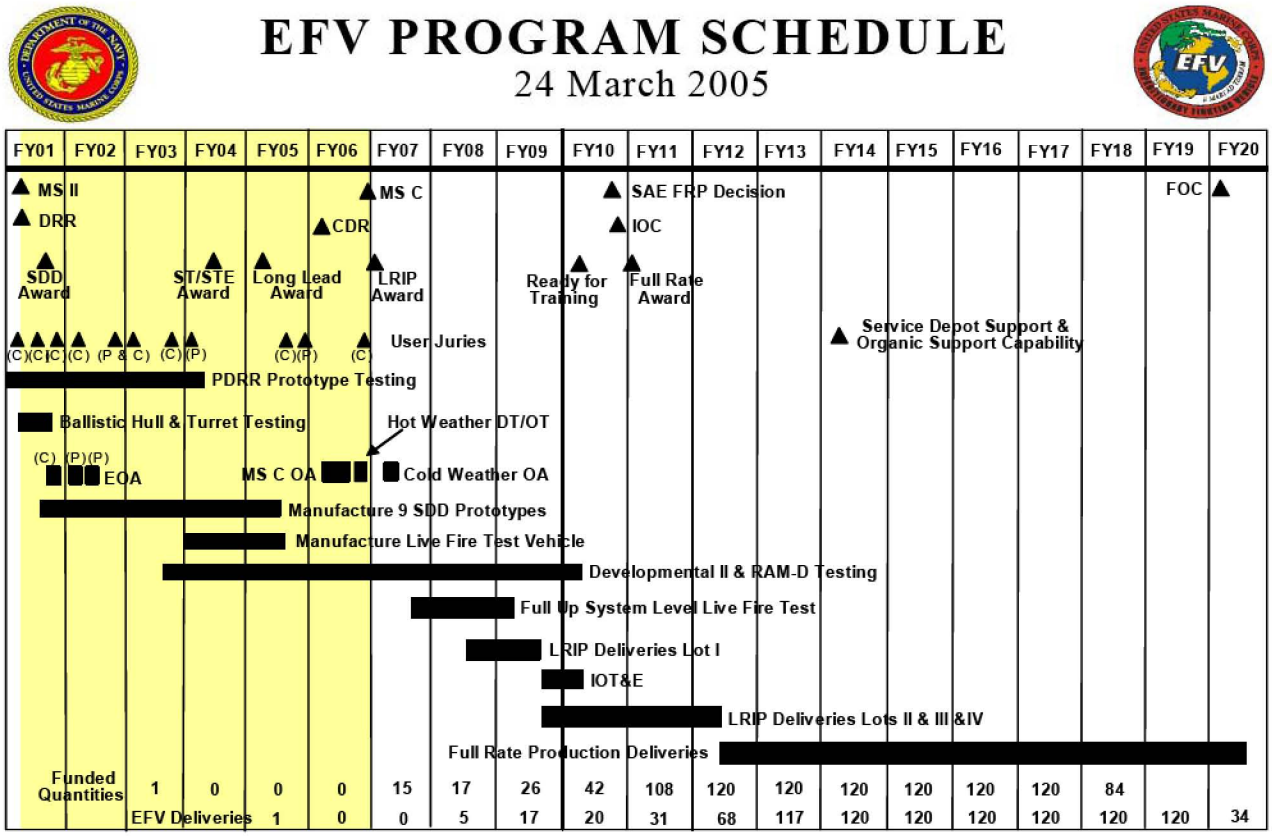


FIGURE 3-1. EFV PROGRAM SCHEDULE

The EFV is a high water speed, fully tracked, NBC protected, armored amphibious personnel carrier, capable of initiating amphibious landings from over the horizon.

The EFV is one component of the Amphibious Triad along with the Navy's Landing Craft – Air Cushion and the Marines' MV-22 Osprey. The EFV provides a revolutionary tactical mobility capability, allowing the Marine Air-Ground Task Force to dominate the littoral battlespace. The EFV provides the capability to launch from over the horizon, to move rapidly across the littorals, and to land at multiple sites. Current obstacles to our landing forces, such as oceans, lakes and rivers, can be used by the EFV as high speed avenues of maneuver and approach; and, on land the EFV has the speed and maneuvering capabilities to operate with the main battle tank.

The EFV will deliver key technology to accomplish the surface element of joint forcible entry operations – the amphibious assault. The ability to transition from waterborne operations immediately into operations ashore provides the capability to fulfill the uniquely Marine mission. The Marine Air Ground Task Force provides a key element of the Marine Forces component of the Joint Task Forces and Combined Task Forces in a combatant command's area of responsibility. These technologies will include capabilities associated with being "Net Ready" and a compliance strategy to be an integral part of the "Global Information Grid."

The EFV has two variants, the EFV Personnel Variant, EFV(P), which functions on land and water as an armored personnel carrier, and the EFV Command Variant, EFV(C), which functions as a tactical echelon command post at the infantry battalion and regimental levels.

The EFV(P) has a crew of three and carries 17 combat-equipped Marines, which is equivalent to a reinforced Marine rifle squad. The EFV is propelled at sea and on land by a 2,700 horsepower diesel engine. The EFV land mobility, land speed and ride quality is equivalent to the M1A1 main battle tank. For high water speed propulsion, the EFV employs two 23-inch diameter water jets for thrust. To reduce drag at high water speed, the EFV retracts its suspension and deploys appendages that provide a smooth planning surface across the bottom of the vehicle. The EFV will plane over water at speeds in excess of 20 knots. The EFV(P) is equipped with a 30mm weapon station, designed to accommodate growth to a 40mm projectile. This weapon station is fully stabilized for all weather, day and night operations. The EFV will also employ a nuclear, biological, chemical (NBC) overpressure system, and incorporates the latest technologies related to command, control, communications, and navigation. Future technology capabilities of the EFV are specified in the draft Capability Production Document (CPD), 28 Oct 04.

The EFV(C) furnishes the supported infantry commander and selected staff at the battalion and regimental levels with a tactical echelon headquarters. The EFV(C) provides the capability to the embarked commander and his staff the ability to command and control his forces, and to communicate with higher, adjacent, and subordinate units; supporting arms units; and combat service support units.

4.0 EFV DMSMS MANAGEMENT TEAM

The following section discusses the policy, mission, organizational structure and relationships, and roles and responsibilities of each member of the EFV DMT. In addition the Integrated Product Team (IPT) supporting the DMT is discussed.

4.1 DMSMS Management Team Policy

The EFV DMT is committed to meeting or exceeding the warfighter's performance needs for a high quality, low cost, operationally ready Expeditionary Fighting Vehicle. The EFV DMT is committed to achieving its goals by fostering a work environment that emphasizes teamwork, pro-active problem prevention and health monitoring, and personal commitment and empowerment to resolve DMSMS issues in a time-sensitive, cost-effective, and technically feasible manner.

4.2 DMSMS Management Team Mission

The EFV DMT mission is to mitigate and manage obsolescence issues for the DRPM AAA and its EFV variants, increase operational availability, and reduce Total Ownership Costs (TOC) by reducing the effects of DMSMS on the EFV program.

4.3 DMSMS Management Team (DMT)

The DMT is the DRPM AAA's team responsible for all DMSMS related issues within the EFV Program. The DMT will monitor the EFV variants for obsolescence and provide recommendations to the DRPM AAA on the best methods to mitigate the effects of obsolete parts and raw material shortages on EFV availability. Monitoring will cover all product areas to include microelectronics, raw materials, structural items, and mechanical devices. First priority will be given to microelectronics which accounts for nearly 80 percent of all industry known obsolescence issues throughout DoD.

The DMT is composed of both Government and PIA representation. This collaboration between Government and PIA ensures that each of these entities have a voice in the recommendations for resolution of EFV obsolescence issues. DRPM AAA, the Government, is responsible for overall DMSMS program management and external liaison while the PIA implements the DMSMS Management Plan.

There are eight core members of the EFV DMT: the PIA (DMT Chair) DRPM AAA DMSMS designated DMT Co-Chair, Director of Logistics (DRPM AAA and PIA), EFV(P) Platform Manager (DRPM AAA and PIA), and EFV(C) Platform Manager (DRPM AAA and PIA). NUWC, Keyport, will serve in a support role to the DMT providing analytical support through the Obsolescence Management Information System (OMIS) database as well as a DMSMS Analyst who will track and verify obsolescence issues, develop business cases, conduct various assessments, and prepare metrics.

DMSMS Leads for both DRPM AAA and the PIA have received familiarization training by the DoD DMSMS Working Group through the DMSMS Fundamentals course in April 2005. Sixty percent of core DMT members have been trained. Plans are for the EFV DMT to attend the DMSMS Executive course in Jun 05.

4.3.1 Objectives of the DMT

The objective of the EFV DMT is to develop and standardize an approach to assess the short-term and long-term impacts of potential obsolescence and recommend methods to mitigate obsolescence in the EFV variants. This DMSMS Management Plan represents the foundation of this objective. This plan will be updated semi-annually to reflect lessons learned and continuous quality improvements used to meet the objectives of the DMT. The approach used by the DMT will leverage the known system configuration and component availability information while integrating additional programmatic information such as system reliability, supply support requirements, Technology Refresh/Insertion, and vehicle block changes as defined in the Technology Roadmap. The team strives to assist DRPM AAA IPTs in reducing TOC as a result of obsolescence issues by influencing pending vehicle design changes, maintenance concepts, and improving Integrated Logistics Support (ILS) products, based on current mission requirements and future mission needs. The DMT will function as an element of the DRPM AAA EFV Program to monitor, manage, and mitigate inherent risks associated with obsolescence. The DMT shall utilize the strategies of PBL and the structure of TLCSM in their efforts to facilitate DMSMS issue. The DMT will also be the system proponent to the original equipment manufacturers (OEM). The DMT will keep the OEMs informed of evolving changes in procurement requirements and resolve industrial base issues that ensure the highest state of readiness for the EFV.

4.4 EFV DMSMS IPT

Figure 4-1 shows that the EFV DMSMS IPT is comprised of the DMT, DRPM AAA members, DMSMS associated government entities, the PIA and its relevant IPTs. The primary role of the DMSMS associated government entities and the IPT members are to provide input to the DMT with recommendations on how to mitigate obsolescence issues surfaced by the DMT. Figure 4-1 also shows the roles and responsibilities and software applications that will be used by each IPT in the implementation of the EFV DMSMS program. The Joint decision-makers provide for program acceptance (or rejection) of the DMT recommendations prior to entering the funding process. The DMT has overall authority to coordinate the workings and interplay of the IPT members.

It can be seen that a fully integrated organization is in-place to support a proactive DMSMS effort throughout the EFV program's lifecycle.

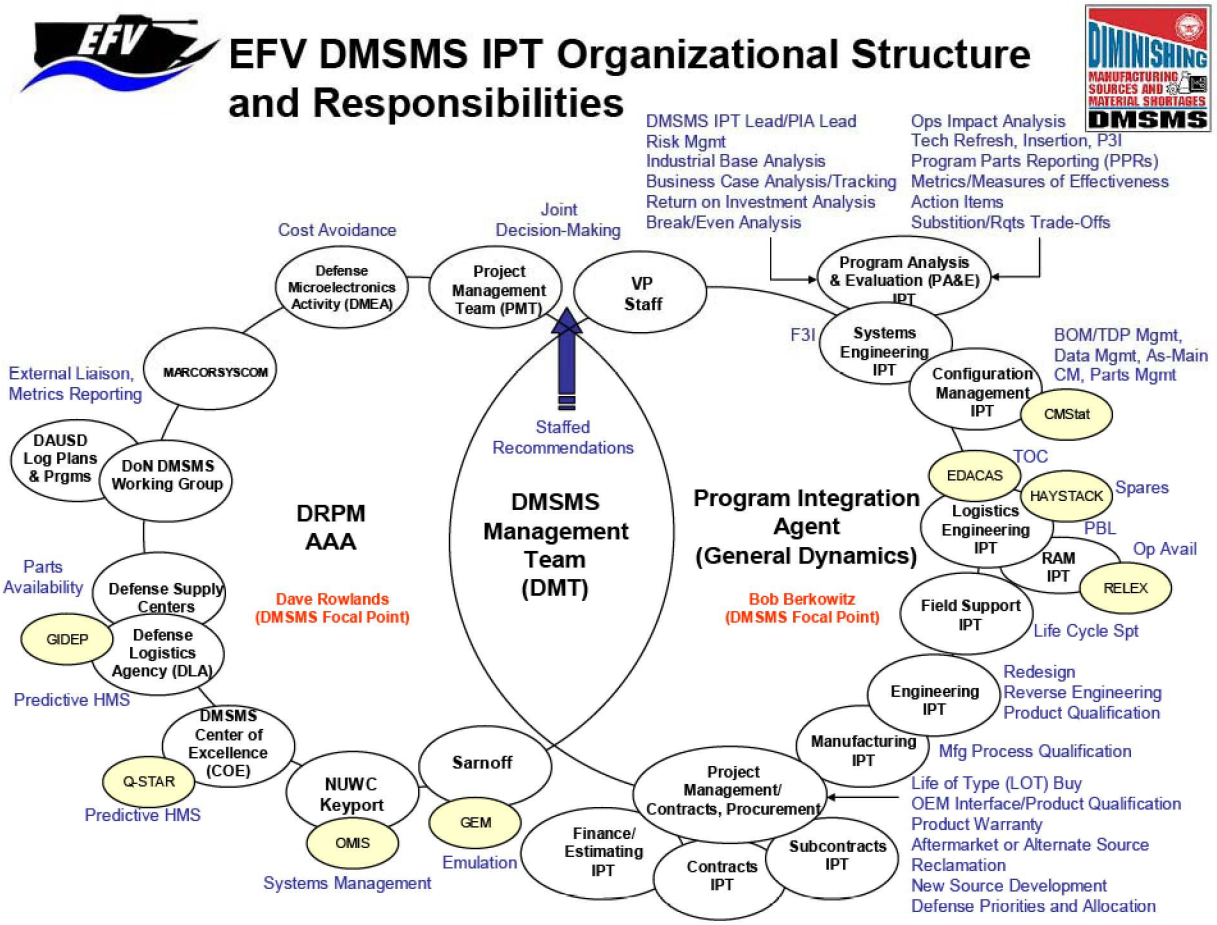


FIGURE 4-1. EFV DMSMS IPT ORGANIZATIONAL STRUCTURE

5.0 MANAGEMENT

5.1 EFV Systems Acquisition Lifecycle

The 2005 DMSMS Guidebook shows suggested best practices for DMSMS resolution during various phases of the system acquisition process. The EFV program is currently in the pre-systems acquisition phase and utilizes open systems architecture, modernization and redesign, redefined requirements, commercial item substitution, modernization through spares, technology refresh, and alternate design techniques to provide an early-on capability to redress obsolescence issues throughout the life cycle. Table 5-1 shows the practices applied during the SDD phase for DMSMS management.

Resolution	Pre-Systems Acquisition (SDD)		
	SDD S/SS	SDD SOW	Demonstrated During SDD (Example)
Open Systems Architecture	3.3.11.7, 3.2.1.1.3.4.2.1.1, 3.3.11.1.2, 3.6.3.4	3.2.1.2.2.1, 3.2.1.2.2.18, 3.2.3.1.5, 3.2.3.1.6	Incorporated Prime Power Controller functionality into High Power Distribution Unit reducing the need for separate box. SDD architecture employs VME chassis, with many LRUs having 50 percent spare capacity for additional circuit card assemblies
Modification or Redesign	3.2.8.2	3.2.1.2.2.18, 3.2.1.2.2.18.1, 3.2.1.2.2.18.2, 3.2.1.2.2.21, 3.2.3.4.1	The PIA evaluates and prioritizes design efforts based on their potential impact on the life cycle cost, vehicle performance, manufacturing, and supportability. This has been established by the EFV Path Forward database which has assessed over 1,000 trade-offs
Redefined Requirement		3.2.1.2.1.2, 3.2.1.2.2.18	Conducted requirements trade-offs and in excess of 100 business case analyses of competing designs to optimize performance, enhance reliability, and reduce production and life cycle cost
Commercial Item Substitution	3.2.1.1.3.5.1.1, 3.2.1.2.3.1.1, 3.3.1.4	3.2.1.2.2.18.2, 3.2.3.7.1.4, 3.2.1.1.1a	Specifications emphasize the maximum use of commercial off the shelf items, and to trade-off reliability, availability, and maintainability of procuring lower cost remove and replace commercial components vs procuring more costly militarized compoents
Modernization Through Spares		3.2.1.1.1a	The PIA has established a Life Cycle Support IPT. The PIA, which will be the Program Management Oversight of Life Cycle Support contract for DRPM AAA, is responsible for developing concepts which establish cost effective total life cycle support, including: reengineering the product support process to use best commercial practices; competitively procuring product support; modernization through spares; and, expansion of prime vendor and virtual prime vendor.
Design Techniques		3.2.5.3	Design rules emphasize the use of balancing design, and to consider obsolescence as part of the design and development process. Obsolescence mitigation planned to be a review criteria of Production Readiness Reviews, Capstone CDRs.
Technical Refresh		3.2.1.1.1.18, 3.2.3.1.6.2	Development of a Technology Roadmap that served as input into the Program Life Cycle Cost Estimate developed by the PIA as well as POM inputs by DRPM AAA
Use Early Warning Databases		3.2.3.1.6.2	Establishing contract with Naval Undersea Warfare Center, establishing accounts, and conducting analysis of EFV design using Obsolescence Management Information System

TABLE 5-1. DMSMS SDD REQUIREMENTS FLOWDOWN FROM DRPM AAA TO PIA

These activities will be further enhanced during the LRIP, full rate production (FRP), and fielding phases through the application of breakout, bridge buy, life-of-type (LOT) buy, contractor requirement or availability guarantee, existing stock, alternate source, existing substitute, after market vendor, emulation, government / organic fabrication facility, reclamation, technical refresh, use of early warning databases, very high speed integrated circuit hardware definition language (VHDL), and early life cycle parts procurement techniques.

5.2 DMT Strategies and Approaches

During SDD, EFV DMSMS design and manufacturing documentation considers design disclosed items, including sub-tier hardware indenture levels; form fit function/proprietary design items, including sub-tier hardware indenture levels. This strategy utilizes PD-1066 (Create and Process Material Request), PD-1071 (Material Acquisition Management), PD-1256 (Obsolescence Resolution), CL-1057 (Material Acquisition Documentation), FM-1151 (Purchase Order Award Justification), FM-1152 (Certificate of Non-Disclosure), FM-1088 (Directive for Use of Specified Source), GL-1090 (Priority Code Identification for Logistics Generated Material Request), STD-1011 (Supplier Selection Standard), STD-1012 (Material Acquisition Approval and Document Requirements for Purchase Orders), STD-1013 (Price/Cost Analysis of Supplier Proposals), WI-1342 (Create Indentured Bill of Material Report), and WI-1353 (Documenting Parts for Vendor Controlled Assemblies), which was developed by the EFV's ISO 9001:2000 certified PIA.

The EFV program's long-term strategy for production and fielding links the obsolescence management program to the technology roadmap, TLCSM and PBL. As the TLCSM for the EFV, the DRPM AAA will develop and implement products, processes, and an infrastructure that supports and sustains the EFV to achieve the desired system readiness identified by the Operating Force. Increased reliability, decreased cost and risk, and optimized product and logistics support practices are the methods by which required system readiness will be realized. This strategy focuses on achieving the goals of readiness throughout each phase of acquisition and across the entire spectrum of military operations. This PBL approach for the EFV, known as Total System Support (TSS), brings decisions of product and logistics support under a single umbrella for those functions that are executed distinctly through the industry partner. The TSS Partner (the PIA will be the interim TSS partner) is the single entity responsible for balancing vehicle design considerations for reliability, obsolescence, and technology integration with optimal maintenance schedules, repair part locations, transportation assets, and stock predictions at an affordable cost and desired readiness level.

There is also a close working relationship between the DMT and the Life Cycle Support IPT. The Life Cycle Support IPT is responsible for the institutionalization of PBL through TLCSM on EFV. DMSMS issues, findings, and decisions will be incorporated in the planning of the Life Cycle Support IPT through the integration of obsolescence and technology data into the Integrated Logistics Support Plan and Fielding Plan.

5.2.1 Proactive Management.

The common practices for proactive DMSMS management form the basis for evaluating progress in implementing DMSMS approaches and strategy, and sets goals to implement in the future.

As of **May 2005**, the EFV DMT would give itself a self assessment at **Intensity Level 1**. This assessment is based upon the following evaluation factors:

- A DMSMS focal point for DRPM AAA and the PIA have been identified
- A DMT has been established
- The DMT has developed and presented an awareness brief to both the DRPM AAA and PIA leadership on DMSMS and its associated process
- DRPM AAA, as the only ACAT ID in the Marine Corps, has initiated a relationship with the DoN to be a standing member of the DoN DMSMS Working Group
- A DMSMS Management Plan has been developed
- DRPM AAA has established a relationship with Naval Undersea Warfare Center (NUWC), Keyport, for the utilization of a DMSMS health monitoring and assessment system, OMIS
- The PIA has provided an indentured BOM in excess of 40,000 parts to support identification, verification, and assessment of obsolescence issues
- The output from OMIS is supporting our screening of parts and raw materials utilized in the design, and supports risk mitigation activities
- DRPM AAA also established DMSMS metrics that will be utilized to support management analysis of the DMSMS program, and for data exchange with external customers on the health of the EFV DMSMS program.

It is the plan of the EFV DMT to obtain **Intensity Level 2** in the **4QTRFY05.** This will be accomplished by enhancing the existing DMSMS program as follows:

- Completing the detailed assessment of the BOM through OMIS integrating technology forecasts, Non-Developmental Item (NDI) Commercial / Government / Modified-Off-the-Shelf) (COTS / GOTS / MOTS)
- Institutionalization of BCA, operational impact analysis (OIA), break-even analysis (BEA), and industrial base analysis (IBA) as a common practice in DMSMS resolutions
- Validating DMSMS performance metrics and having six months of artifacts to support our case history files
- Establishment of the EFV DMSMS web page

The EFV DMT plans to reach **Intensity Level 3 or 3+** in the **2QTRFY07**. This will be accomplished by enhancing the existing DMSMS program as follows:

- Procurement of detailed BOM data to the microcircuit level by the PIA for their sub-tier suppliers
- Expansion of our technology refresh and insertion strategies into DMSMS planning and forecasting coupled with greater insight into annual POM funding requirements to mitigate unknown/unknown DMSMS issues
- Transition of our OMIS database into a more forward looking predictive capability
- Increased electronic data interchange of EFV DMSMS case resolutions with other DoD programs through the DMSMS Center of Excellence (COE)
- Establishment of a web link between the DMSMS COE and the EFV DMSMS web page as a best practice
- Translation of our circuit design into VHDL

5.2.2 DMT Administration

As previously stated the DMT will be chaired by the PIA. The PIA will maintain meeting minutes, issue meeting agendas, and action items. A review of actions items will be a standing agenda item for all DMT meetings. Meeting minutes will be documented using FM-1038. A business case log will also be maintained to track management metrics on the number of business cases opened, resolved, and closed by fiscal year and mitigation solution.

5.3 Budgeting and Funding

As stated previously, a lack of dedicated DMSMS funding can hamper even the best intentions and efforts of the DMT. A reactive approach to DMSMS issues often results in dollars from other program areas having to be used to resolve obsolescence issues. The DMT is committed to a proactive approach to obsolescence issue resolution. Budgeting and locating funding for DMSMS issue resolution mandates a proactive approach. The DMT strategy is to look ahead proactively to identify an obsolete part, work up the best method for resolution, and secure funding to resolve the issue. This will require continuous funding for the DMT throughout the life cycle of the EFV program by planning, programming, budgeting and estimating well in advance for the dollars to resolve obsolescence issues. A close working relationship between the

DMT and the Technology Refresh activities will enhance the DMT's ability to coordinate funding for DMSMS. Essential to the success of this pro-active approach will be the monthly BOM update into OMIS by the PIA.

5.3.1 Life Cycle Cost Estimates and POM Inputs for DMSMS

As input to the budgeting and funding process, the PIA conducts an annual program assessment to revalidate known obsolescence, technology insertion / refresh, and pre-planned product improvement requirements for the EFV program. As part of this annual re-assessment the PIA forecasts what changes are planned, when they would be implemented; and, what is the life cycle cost impact to implement and support these changes. This input is then integrated into the PIA's annual Program Life Cycle Cost Estimate submitted to DRPM AAA annually. DRPM AAA then utilizes this input in the development of POM inputs for submission to their resource sponsor. During the POM cycle periodic reassessments and prioritization of technology needs are made utilizing guidance in the CPD, funding constraints levied by the Marine Corps Combat Development Command (MCCDC), with results of BCA. Until the EFV production program matures, and the annual funding requirement for DMSMS can be better quantified, then DRPM AAA will submit funding requirements for DMSMS resolution based upon historical experience of the PIA on analogous products.

5.4 Contractual Requirements

The PIA is contractually obligated to execute the EFV DMSMS program. As the TLCSM, the DRPM AAA understands its responsibility to reduce total cost of ownership, increase logistics readiness and vehicle availability.

5.4.1 Incentives

The Program Manager's Product Support Guide states that "all PBL performance-based agreements should include: performance objectives, responsibilities, reliability growth targets, maintainability improvements, term of contract, flexibility (range of support), diminishing manufacturing sources (DMS)/obsolescence, continuous modernization/improvement; incentives/penalties, and cost reduction/stability."

As previously said, the LRIP Contracts for the EFV Program are currently in development. These contracts will be performance based. To further this end Performance Based Agreements (PBAs) will be established as follows:

- A PBA between DRPM AAA and Marine Corps Combat Development Command (representing the war fighter),
- A PBA (defined in the contract) between DRPM AAA and the PIA, and
- A PBA (defined in the contract) between the PIA and its Support Contractors.

Within these contracts will be language that includes the metrics required to be provided by the contractor to produce the desired performance outcomes, as described by the war fighter. In order to motivate the contractor to achieve the desired metrics, the contracts will include

appropriate contract incentives such as award fee, award terms, and share in savings to promote and facilitate contractor performance.

5.4.2 Implications for Source of Supply

5.4.2.1 Production Readiness Reviews (PRR)

In preparation for Milestone C, the DRPM AAA has tasked the Defense Contract Management Agency's (DCMA's) Industrial Analysis Center (IAC) to support the DRPM AAA in assessing the industrial capability of the EFV supplier base to design, develop, produce and support the EFV program. The process will include industrial, technical and financial evaluations and will address the adequacy of the supplier base to meet postproduction operational needs.

DCMA IAC will prepare an IBA that will provide a determination of the suppliers' ability to meet post-production operational needs including production risks, volatile technological areas, opportunities for competition and common buys with other programs, obsolescence risks and single/sole source supplier risks.

Additionally, the PIA, in concert with the DRPM AAA, will be conducting a second series of PRRs. The PIA chair to the DMT is an integral member of the PRR team as well. During these PRRs the team has established criteria that will be considered related to DMSMS including:

- How long will existing technology be available (technology refresh, obsolescence timeline)
- Overall project risk assessment; technical, cost, schedule, include plans and timeline to reduce/eliminate identified risk
- Flow down of customer technical data package (TDP) requirements to major sub-tier suppliers
- Industrial base capability and capacity assessment to manufacture sufficient quantities to support program and surge production rates
- If inadequate production capacity, does supplier need funding to facilitize production line to meet program needs
- Supplier product, process, and production line qualified
- Assessment of national security and foreign dependency risk impact – Other domestic and overseas programs that utilize the same product, complexity to manufacture, competition
- Hardware and software special tooling/special test equipment, fixtures, chip and die availability, microchip storage and shelf life

5.4.2.2 Critical Design Review

Similar to the PRRs the DRPM AAA has established review criteria as part of the CDR scheduled in Mar 06. These criteria will assist DRPM AAA and the SAE to assess the adequacy of the design to transition to production. Exit criteria related to DMSMS follows:

- Technical approval of vendor design including identification of configuration items, identification of non-compliance issues (waivers and deviations), spare parts listing, and obsolescence issues
- Programmatic includes schedule assessment, cost assessment, and risk assessment
- Technology refresh and pre-planned product improvement (P^3I) strategy incorporated into POM input to ensure adequacy of production rates within affordability constraints

5.4.2.3 LRIP Contract Language

During the end of the SDD phase DRPM AAA is developing, under an alpha-contracting environment, the LRIP System/Subsystem Specification (S/SS) and Statement of Work (SOW). The DMT is utilizing the DMSMS Acquisition Guidelines: Implementing Parts Obsolescence Management Contractual Requirements, Dec 2001 as guidance in the development of recommended language for use in the S/SS and SOW. These documents will be used to define the scope of work and acceptance criteria to the PIA, as the program transitions from a cost plus contracting environment during FRP.

The PIA intends to levy DMSMS contract language to its source of supplier. This will be accomplished by requiring, within the constraints of prioritized funding, major suppliers to prepare and submit the following:

- DMSMS Management Plan,
- Indentured BOMs down to the microcircuit level, and
- DMSMS Alert Notices highlighting component utilization history over the last two years, anticipated component consumption for the next five years, and, on-hand inventory and outstanding orders

Other areas being evaluated include the development of a Statement of Objectives as well as unique contract language in Section H (Special Clauses), Section l (Instructions to Offerror Clauses), and Section M (Evaluation Criteria Clauses). Flowing down these requirements will assist the DMT in its pro-active approach to DMSMS management throughout the lifecycle.

5.4.3 Deliverables

In accordance with SOW paragraph 3.2.3.1.6.2, the PIA is under contract to deliver the EFV DMSMS Plan (CDRL S066) and semi-annual updates through the end of the SDD phase. The PIA is to implement the DMSMS predictive tools suite, deliver and maintain a BOM (updated quarterly into OMIS), provide a quarterly OMIS risk assessment based on updated BOM, and provide monthly DMSMS-related metrics. The PIA is also responsible for conducting DMSMS-related BCA, OIA, IBA, and BEA, as defined by Section 9.0.

5.4.4 Metrics

Appendix D shows the metrics to be compiled by the PIA, on behalf of the DMT and DRPM AAA. These metrics will include a FY assessment of the number of business cases resolved, closed, estimated cost to resolve/close, and cost avoidance for each mitigation solution: original component (existing stock, continue to manufacture, reclamation), alternate, substitution, LOT

buy, aftermarket, emulation, reverse engineering, redesign (minor and major). Until calibrated cost avoidance data is developed by the EFV program then Defense Microelectronics Activity (DMEA) Cost Resolution Report data will be utilized.

5.4.5 Exit Criteria

The PBL: A Program Manager's Product Support Guide states that "PBL contracts should include adequate exit criteria or "off-ramps" should worst-case scenarios arise regarding contractor inability to (or loss of interest in) continuing to provide support. In general, these exit criteria should be included as negotiated options for the acquisition, transfer, or use of necessary technical data, support tooling/equipment, and the appropriate conversion training required to reconstitute or recompete the support workload." For the EFV DMSMS program, the necessary technical data equates to the DMSMS Case Management Data and the BOMs for the active microelectronics on the vehicles. The archived DMSMS Case Management Data will be available from the PIA to DRPM AAA for a period of seven years after contract recompete or termination.

5.4.6 Proprietary and Data Rights Issues

Data is essential to the DMT's ability to proactively work DMSMS. Proprietary data rights agreements are the means of gaining this data. The DMT will work with contracting personnel to establish proprietary data rights agreement between DRPM AAA, PIA, and sources of supply.

When the PIA did not procure data rights from the OEM then the PIA will first attempt to offer to the source of supply an obsolescence analysis of the design through OMIS in exchange for a detailed BOM listing that would assist them in future procurements and sales to EFV. When this is not a successful strategy then Sunset Supply Base (Corona) would be used.

5.5 DRPM AAA Management Oversight of PIA DMSMS Program

As core members of the DMT, DRPM AAA representatives have access to all data and analysis developed by the PIA. In their role of management oversight the DRPM AAA will give guidance and direction, as required, to ensure that the PIA conforms to the contractual requirements, and that DRPM AAA is pre-positioned to have adequate insight and supporting documentation for external liaison outside of the program office on all matters related to DMSMS. The DMT's DRPM AAA and PIA focal points meet weekly in which redirection and guidance is provided, as required.

5.6 Standardization and Commonality

In the development of mitigation strategies for EFV obsolescence issues commonality and interchangeability among the EFV and other DoD programs will be considered. The EFV design leverages existing Joint Technical Architecture (JTA)-compliant fielded systems to achieve efficient joint standardization, interoperability, and commonality. Parts selected for use in the EFV have been selected to achieve maximum commonality, as practical, with the projected U.S. Marine Corps, U.S. Army mechanized vehicles, and other DoD inventories during the EFV life span in accordance with the U.S. Government policies on NATO Rationalization, Standardization and Interoperability (RSI). All parts having the same part number are

functionally and dimensionally interchangeable and replaceable with each other with respect to installation and performance. The EFV has established commodity managers for like product lines, and uses processes to standardize use of like materials across programs. The EFV program takes maximum advantage in the utilization of NDI COTS/GOTS/MOTS, and has nearly an 80 percent commonality between the P- and C-Variants. This advantage pre-positions EFV to reduce cost and increase reliability by leveraging technology insertion from other fielded programs.

5.7 Design Rules

During the SDD phase the PIA utilized a series of design guidelines and rules to minimize complexity and enhance supportability to the evolving EFV design solution for FRP. Inherent in this process was the utilization of highly dense integrated circuits which were used to reduce the number of individual discrete parts / chips, interconnections, size, power consumption and cooling requirements. Additionally, a derating factor was applied that limited the electrical, mechanical, and thermal stresses on those parts to less than their design life. This practice of derating was called the application of safety factors on the EFV design. As a common design practice a safety factor of 1.5 was applied to the EFV. As electronic parts underwent first article and qualification testing they were subjected to both burn in testing and environmental stress screening that evaluated the hardware through temperature cycling and random vibration non-destructive events, so that workmanship defects of the electronics assemblies could be identified and resolved early-on in the SDD phase.

6.0 DMSMS AND EFV TECHNOLOGY ROADMAP

The DMT's DMSMS strategy is to integrate with the EFV Technology Roadmap, Feb 2005. There are no critical items or technologies used on the EFV program that are unique. As the EFV DMSMS program evolves and as obsolescence issues are identified then the time sensitivity for the resolution of the issue will be evaluated against the planned date for incorporation of new technology. If a new technology is planned for incorporation before the occurrence of the obsolescence takes place then the obsolescence issue is naturally mitigated by the integration of the new technology. In instances where a technology upgrade is scheduled to occur after an adverse DMSMS impact occurs then remedial steps will be assessed and implemented based upon the results of a business case analysis.

The EFV technology roadmap recognizes that hardware modifications are driven by obsolescence, software changes, and/or new functionality. The roadmap estimates that it will require three (3) years to implement a refresh of a major microelectronic unit, to include requirements definition, test and validation of the unit, and install.

The EFV technology roadmap defines a refresh schedule for the following high priority microelectronics items as follows:

1. Hull Electronics Unit (HEU)
    a. HEU Spray Cool Chassis and Spray Cool Components every fifteen (15) years
    b. HEU Controller processor every three (3) years
    c. HEU Command and Control Server every three (3) years

    d. Programmable Maintenance Device every three (3) years
2. Weapon Station Electronics Unit refresh general purpose processors every three (3) years and chassis every fifteen (15) years
3. Common Display Panel processor and memory circuit card technology refreshes every three (3) years and perform a major redesign of the display and chassis every fifteen (15) years
4. Multiple Processor Unit (MPU)
    a. MPU Switch every three (3) years
    b. MPU TDN/Video Server every three (3) years
    c. MPU Spray Cool Chassis with Controller every fifteen (15) years
    d. MPU Router every three (3) years
5. Display processor Units refresh every three (3) years and perform a major redesign of the display and chassis every fifteen (15) years

The technology roadmap provides initial guidance and will be adjusted based upon technology advances and new system requirements.

7.0 EFV CONFIGURATION MANAGEMENT AND BILL OF MATERIAL DATA MANAGEMENT

The foundation for effective life cycle DMSMS management resides in careful integration of DMSMS program management elements with system/equipment program and configuration management (CM) requirements. Maintenance of accurate configuration data to the piece part level is essential in support of DMSMS impact assessments and resolution analyses. Accurate configuration data also supports visibility of forecast out-year DMSMS problem areas and provides the basis for proactive DMSMS resolution efforts. At the same time, this information will also support visibility of potential out-year DMSMS problem areas and provide the basis for proactive resolution efforts. Accordingly, an effective life cycle DMSMS management program will involve components from each of the following areas.

7.1 Configuration Item Identification/Analysis

Development and maintenance of current configuration item listings to the piece part level are essential to effective DMSMS program management. Moreover, as system parts lists are analyzed and corrected, line items will be subject to quarterly technology/risk screening to identify existing and potential out-year DMSMS problems. By the end-3QTR FY05 all configuration items for EFV will have been loaded into OMIS with an initial assessment of obsolescence issues having been identified for mitigation. Subsequent updates of configuration data will be incorporated into OMIS on a quarterly basis. Both piece parts and sources of raw materials are included in the EFV assessment of DMSMS.

7.2 Parts List Review/Prioritization

Once general DMSMS risk factors have been assigned to system parts lists, a prioritized set of targets for both reactive and proactive DMSMS analyses may be developed. All current and near term problems will be slated for immediate investigation, with remaining line items categorized by projected out-year availability. Rankings may be further refined to reflect general

engineering judgment, specific item/source risk elements as identified during case analysis, or individual item characteristics deemed appropriate (e.g., criticality, number of applications, demand volume). Items that are single source and those for which the Government cannot obtain data rights will be initiated as a risk, in accordance to PD-1086 (Risk Management), with mitigation plans developed that are funded and support program need dates.

7.3 Periodic Market Assessment

Although DMSMS screening has the potential to assist in statistical problem prediction, the accuracy of such forecasting for individual line items cannot be guaranteed. As discussed above, direct manufacturer coordination is often the only way to precisely evaluate DMSMS vulnerability for specific items. The DMT will therefore establish a program of periodic contact with selected sources of supply, other industrial organizations, and government agencies in order to maximize early identification of DMSMS issues. This will be implemented through existing relationships between NUWC, Keyport, manufacturers, and OEMs.

Once life cycle DMSMS management procedures are established, the DMT will be able to conduct proactive analyses on projected out-year DMSMS candidates. Such analyses may be useful in minimizing crisis DMSMS situations and associated readiness and cost impacts. These procedures will also allow the DMT to keep a running profile of system/equipment DMSMS vulnerability, which can be helpful in maintaining a total "system" perspective during individual item resolution considerations. With a life cycle DMSMS management program in place, the DMT will support cost-effective identification and resolution of DMSMS problems before they become crisis situations impacting weapon system supportability and readiness.

7.4 BOM Configuration Management Data

BOM data from the EFV CM database application suite will be used as input into OMIS to proactively identify and assess obsolescence issues and risks. BOM data will be stored in a network location that is readily accessible by both DRPM AAA and the PIA. The PIA is responsible for extracting indentured BOM data from the CM suite and loading into OMIS. A monthly reassessment will be performed by the PIA with a risk assessment by NUWC, Keyport, and recommended path forward by the PIA being provided to the DMT. In conjunction to indentured BOM data being input into OMIS the DMT will also provide RELEX inputs as well. This will facilitate the conduct of competing obsolescence mitigation trade-offs against operational availability impacts

7.4.1 BOM Data Information

For DMSMS analysis the following data elements will be collected for piece parts input of the BOM into OMIS:

- Item name/description,
- Prime contractor part number including packaging and revision codes,
- Commercial and Government Entity (CAGE) Code,

- Associated original and manufacturer name, part number and CAGE code, that includes packaging and revision codes,
- Unit quantity, and if applicable,
- Firmware version,
- Material Type (as identified),
- NDI COTS/GOTS/MOTS Item, and
- Reliability

The preferred format for the BOM is an editable electronic format using XML data standards.

7.5 DMT and CCB

The CCB is responsible for review and approval of configuration item changes to the EFV. As part of this process a representative of the DMT sits on the CCB and assists the decision-making process of establishing vehicle cut-in and informs them of technology modernization upgrades that would preclude the need to incorporate the proposed design change into the vehicle block upgrade program. Approved Class I ECRs will serve as the basis of BOM updates for OMIS. The PIA will submit quarterly updates of the BOM to NUWC, Keyport.

7.6 Trade-Off Analysis

One of the many responsibilities of the DMT is to conduct trade-offs of competing emerging and evolving technologies for integration into the EFV. This is done through a combination of return on investment (ROI) analysis, BEA, IBA, and OIA. The following approaches will be applied in support of the business case process for EFV:

- ROI analysis will compare the non-recurring and recurring investment required to develop a new capability as compared to the recurring cost to maintain the existing capability over its life cycle. The two costs will then be assessed to leverage limited resources and maximize payoff for low-cost/high-payoff solutions. Generally, DoD expects a ten fold return on investment ratio, and that the technology could be transferred to the commercial sector. Some factors that are considered in return on investment analysis are weighted measures of effectiveness. The three current measures of effectiveness weightings for EFV are reliability, performance, and design to unit production cost.

- BEA will compare the non-recurring and recurring investment required to develop a new capability as compared to the recurring cost to maintain the existing capability over its life cycle. Generally, DoD expects to break even from its investments in five years or less.

- IBA will examine the production and surge capacity and capabilities of the supplier base in terms of product, process and production line qualification. Assessments of the financial stability to deliver end items, of high quality, to the PIA on schedule and within a fixed cost. This analysis will be performed as part of the PRRs.

- OIA will comparatively estimate the operational availability impacts of various obsolescence solution options based on cost avoidance opportunities.

Outputs of these assessments will be provided the engineering stakeholders as well as members of the DMT and senior management for EFV for decision-making.

8.0 EFV DMSMS DATA MANAGEMENT ARCHITECTURE

The EFV DMSMS program uses several tools to pro-actively manage an integrated approach to identify and resolve obsolescence issues in a time-sensitive, cost-effective manner. User accounts for OMIS and Government-Industry Data Exchange Program (GIDEP) are being established and utilized. In addition, the EFV program will continue to coordinate with the DMSMS COE, as the DoD clearinghouse to communicate information of DMSMS-related tool upgrades and resolve obsolescence issues in a collaborative manner.

Figure 8-1 illustrates the tools used and the flow of DMSMS-related data in support of the EFV program. Tools used by the EFV program are accepted DoD and industry best practices, and include applications for systems health and monitoring, risk assessment and mitigation, operational impact analysis (OMIS), alert notices (Shared Data Warehouse, GIDEP, OEM notification, market analysis), BOM analysis (QinetiQ's - Sustainment Technology Assessment Resource (Q-STAR), (TACTRAC)), reliability assessment (RELEX), cost avoidance (DMEA database), and spares/provisioning (Web Customer Account Tracking System (WebCATS), Logistics On-Line Access (LOLA). Appendix E and F provides additional information on each of the tools used in the EFV DMSMS tools suite. Application of these tools and the supporting analysis will continue to prove beneficial to EFV as it transitions from development to production. Outputs of theses DMSMS-related analyses will be input to EFV's Fielding Plan (more commonly referred to as the Post Production Support Plan) and the Integrated Logistics Support Plan. Plans are to have a detailed BOM assessment completed by end-Jul 05, with an update supplemented by a risk analysis at the LRIP Production CDR in Mar 06. These will serve as DRPM AAA input to the Milestone C, LRIP, Defense Acquisition Board review in 1QTR FY07.

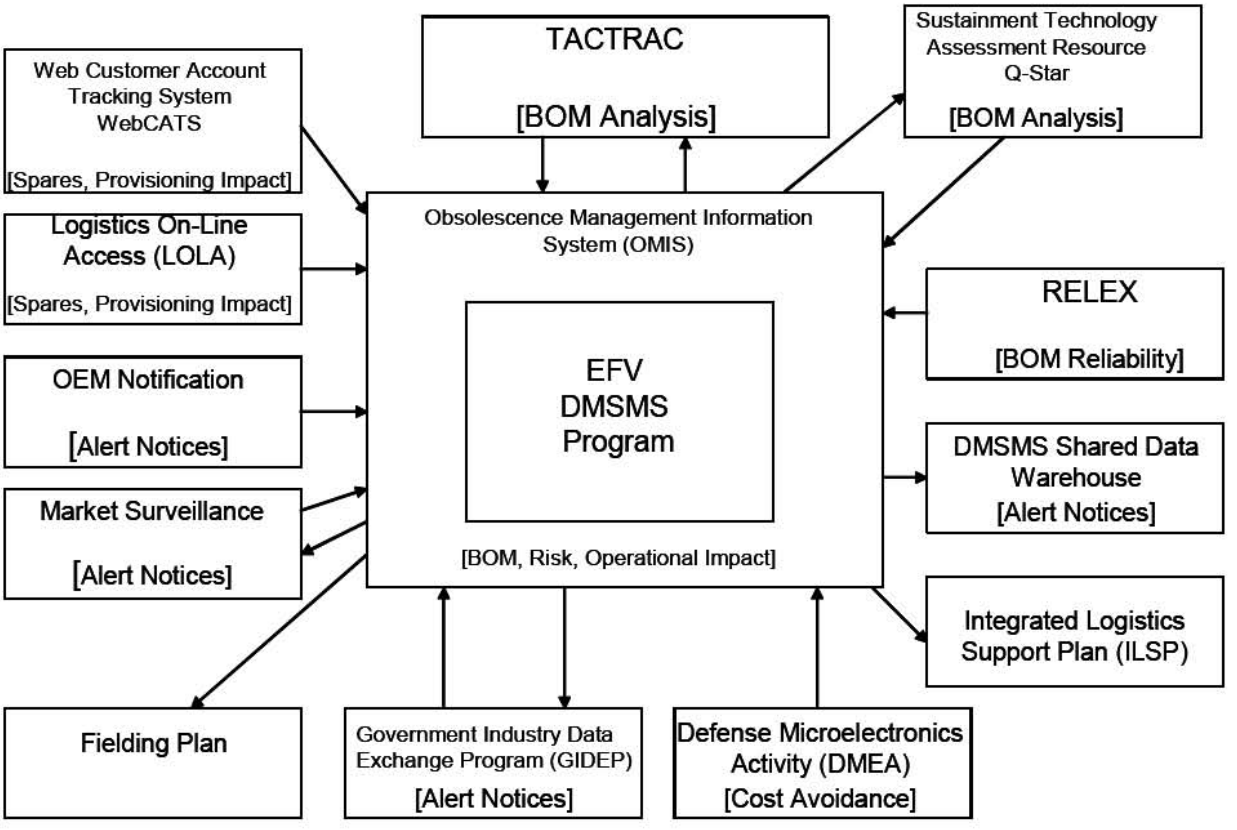


FIGURE 8-1. DMSMS DATA MANAGEMENT ARCHITECTURE

9.0 EFV DMSMS RESOLUTION PROCESS

The EFV DMSMS Resolution process, PD-1256 (Obsolescence Resolution), is shown in Figure 9-1. The following section discusses the specific activities that are followed in each step of the process.

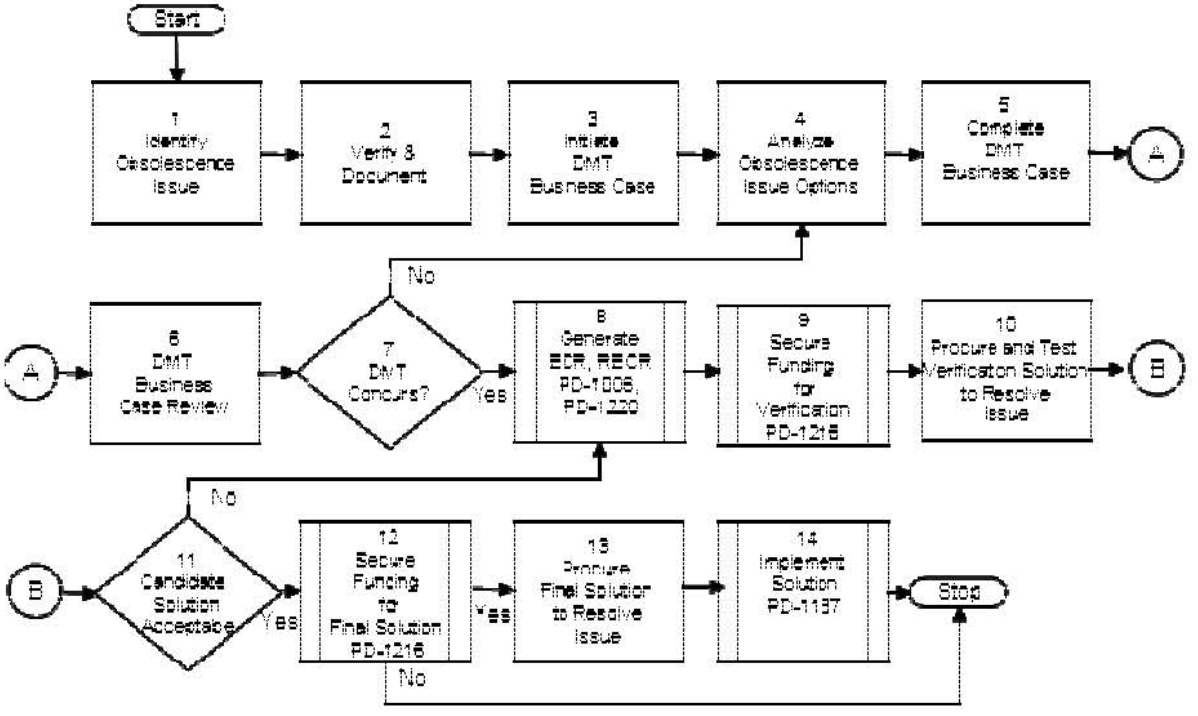


FIGURE 9-1. EFV DMSMS RESOLUTION PROCESS

9.1 Identify Obsolescence Issue

The EFV DMT will obtain discontinued item alerts issued from a variety of sources including, but not limited to, buyer notification from sources of supply, from the Marine Corps, other Defense Services and Agencies, other Government Agencies, the GIDEP, OMIS, and the DMSMS Technology Center.

Identified obsolescence issues should be reported to the DMT who will log the potential issue and document the date that it was identified. After the obsolescence issue has been identified, and prior to opening up a DMSMS business case, it will be verified by the DMT.

9.2 Verify & Document

The DMT will begin DMSMS case verification after receipt of an alert. The objective of verification is to ensure reported DMSMS situations are valid and to evaluate the impact upon EFV. The DMT will carefully validate case information prior to proceeding with full investigation efforts.

Once this utilization assessment is completed, the DMT, through the PIA's Contracts and Procurement organization, submits a Request For Information (RFI) to the supplier to verify that the identified hardware or software configuration item will no longer be produced or will be going out of production. Turnarounds will be requested from the supplier within 30 days. Until a formal response is returned from the vendor, the DMT logs the potential issue into OMIS, EFV's obsolescence health management system, as a watch item. If the response returned from

the supplier verifies that the identified hardware or software configuration item will no longer be produced or will go out of production, the DMT initiates a business case. Once a business case is opened then the watch item is closed.

9.3 Initiate DMT Business Case

Once a potential obsolescence issue has been identified and verified, the DMT opens a DMSMS business case using FM-1148, BCA. Each DMSMS business case is assigned a unique identification number and logged into OMIS to ensure timely resolution of obsolescence issues.

The EFV DMT will assign a case number and develop detailed item characteristic, cross-reference, and application data. The DMT will screen for alternate parts or sources, and acquire technical and logistics information necessary to determine case resolution alternatives. The DMT will also estimate LOT requirements projections.

The DMT will collect complete part specifications and other technical data for both the DMSMS item and the Next Higher Assembly (NHA). This may include drawings (Level 3 when available), including all applicable Source Control and Vendor Item Drawings (SCDs) and special part testing requirements or programs. The DMT will maintain close coordination with the OEM to determine availability, accuracy, and adequacy of the data and drawing package.

Data availability and cost information may impact selection of DMSMS case resolution alternatives. This information will be integrated within the analyses. Additionally, engineering support may be required to define resolution alternatives. In some cases, additional funding will be necessary to execute investigation of resolution alternatives.

In some cases, original drawings may be incomplete or inadequate for DMSMS analysis. The DMT may need better drawings from the manufacturer or engineering activities. If necessary, the DMT, with the help of the engineering community, will determine the need for and estimated costs of procuring additional or more detailed drawings.

The DMT may also have to determine the need and cost of obtaining technical information of a proprietary nature. This may include process and testing information.

The EFV DMT will ensure establishment of DMSMS case history files containing all data collected or developed during the resolution process. The files, electronic media and/or paper, will be maintained to support follow-on analyses and to assist other Marine Corps and government activities in conducting related DMSMS investigation efforts. As a corollary action, the DMT will establish procedures for tracking/monitoring prospective source, technology or other DMSMS risk areas identified during case investigations. For example, conversations with manufacturers may indicate emergent DMSMS problems or broader supplier financial or technical circumstances that may affect continued production operations. Alternately, a prevalence of DMSMS cases involving similar part types or technologies may suggest general obsolescence trends. The manager will record and monitor any such source/technology trends in support of life cycle DMSMS management efforts.

9.4 Analyze Obsolescence Issue Options

After a DMSMS business case is initiated, as assessment of the available options will be evaluated by the DMT in conjunction with stakeholders.

Alternatives to be considered in the development and evaluation of options include, but are not limited to, the following:

- Incentivization
- Contractor Maintained Inventory
- Form, Fit, and Function Interface (F^3I)
- Product Warranty
- Substitution
- Aftermarket
- LOT Buy
- Reclamation
- Redefining Requirements to Accept NDI COTS/GOTS/MOTS
- Emulation
- Interchangeability
- Reverse Engineering
- Redesign
- Develop New Source
- Defense Priorities and Allocation System (DPAS)

A description of each of approach is included in Appendix C, Glossary, Terms and Definitions.

9.5 Complete DMSMS Business Case

In support of the decision-making process, and for each DMSMS BCA, a prioritized OIA, ROI, BEA, and IBA recommendation will be made by the DMT. The BCA will be prepared in accordance with PD-1216 (Program Downselect of Competing Unfunded Initiatives) applying FM-1148 (BCA). The Case Resolution Analysis Worksheet shown in Appendix G will be used to document which solution was implemented and its rationale as well as what options were not recommended and why. The NAVSEA DMSMS Case Resolution Procedures Guide and the Air Force Material Command DMSMS Case Resolution Guide will supplement the BCA process of PD-1216 and FM-1148, as appropriate.

9.5.1 Analyses Conducted to Support Decision-Making Process

9.5.1.1 Operational Impact Analysis (OIA)

An OIA, as a companion analysis to the BCA, predicts the effects of obsolescence on operational readiness. Whereas the BCA predicts the cost effectiveness of a DMSMS Management Program, the OIA answers the question, "What happens to the inventory of lowest replaceable unit (LRU) and service replaceable unit (SRU) spares – and ultimately the weapon system – if nothing is done about DMSMS?"

OIA methodology is sensitive to the following complex data sets:

- Platform operating hour forecasts
- Failure rates of the LRUs and SRUs
- Obsolescence trend of the system components (if the configuration is full of obsolescence, the greater probability that the LRUs and SRUs which fail will not have repair parts in stock due to their unavailability)
- Number of spares of each type LRU and SRU in the system (with minimum spares, obsolescence-induced shortages could trigger a operations impact sooner)

The OIA methodology assumes that some obsolete parts could be reclaimed from a pool of non-reparable SRUs. This pool is a source of reclaimed parts for the next time a SRU, of that type, comes in for repair. Because of reclamation problems, the yield of pool parts from this pool will be less than 100%. Eventually the SRU spares pool will become exhausted, causing the effective loss of an LRU spare when used to supply a spare of the needed SRU. The model is sensitive to operational hours and failure rates as mentioned before.

9.5.1.2 Return on Investment Analysis

ROI analysis will compare the non-recurring and recurring investment required to develop a new capability as compared to the recurring cost to maintain the existing capability over its life cycle. The two costs will then be assessed to leverage limited resources and maximize payoff for low-cost/high-payoff solutions. Generally, DoD expects a ten fold ROI ratio, and that the technology could be transferred to the commercial sector. Some factors that are considered in ROI analysis are weighted measures of effectiveness (MOE). The three current MOE weightings for EFV are reliability, performance, and design to unit production cost.

9.5.1.3 Break-Even Analysis

BEA will compare the non-recurring and recurring investment required to develop a new capability as compared to the recurring cost to maintain the existing capability over its life cycle. Generally, DoD expects to break even from its investments in five years or less.

9.5.1.4 Operational Availability Analysis

Operational Availability analysis will comparatively estimate the operational availability of various obsolescence solution options based on cost avoidance opportunities. Utilizing demonstrated performance, as documented in RELEX, the OMIS database will be utilized to assess alternative solutions that will maximize operational availability.

9.5.1.5 Industrial Base Analysis

IBA will examine the production and surge capacity, capabilities, and risks of the supplier base in terms of product, process and production line qualification.

9.5.2 Timeline for Development of Recommended Solution to DMT

The EFV DMT has established an objective that they should have a path forward that resolves each issue within 120 days from the point that the obsolescence risk was identified. The recommended timeline for this objective includes is based on the following intermediate milestones:

- 14 days for identification and verification by the DMT,
- 30 days for receipt of RFIs from vendors,
- 9 days to prepare the business case,
- 7 days to bring the business case to the DMT for review and approval, and
- 60 days to secure funding for the resolution of the obsolescence issue.

The path forward should be staffed and reviewed with impacted stakeholders for any modifications needed prior to bringing the recommendation forward to the DMT. After the stakeholders have reviewed the path forward, the completed recommendation, and supporting documentation, should be electronically transmitted to members of the DMT as a "read-ahead."

9.6 DMT Business Case Review

FM-1148 will be used to support decision-making to determine acceptable solutions for resolving DMSMS issues. Case resolutions may include a mix of two or more alternatives since the potential may exist to combine resolution options to achieve cost, technical or schedule benefits. For example, modified LOT buys may be executed to provide sufficient stopgap material while longer term design-related alternatives are pursued. Therefore, throughout the case investigation process the DMT will consider the potential for integrating elements of different methodologies to support cost-effective resolutions. In performing investigations, the DMT will work closely with manufacturers and other DMSMS POCs to ensure availability of comprehensive case data. The DMT will, if possible/appropriate, coordinate/maintain its activities / investigations with other impacted organizations to maximize exchange of pertinent information, and provide technical and economic leverage associated with combined resolution efforts.

During conduct of BCA, the DMT will repeatedly attempt to coordinate with the OEM to support interim or long-term production. Continued attempts at alternate part or supplier identification will also be pursued.

Once a resolution alternative has been selected, it will be reported to the EFV DMT, where its recommendation will be concurred or rejected based on available cost, schedule, and performance data.

If the obsolescence issue is deemed by either the DRPM AAA or PIA to be a moderate or high risk then PD-1086 (Risk Management) will be utilized in which the risk is identified and a mitigation plan is developed and tracked until it is closed.

All DMT concurred recommendations will be forwarded to the DRPM AAA for final approval at a quarterly DMSMS decision brief. At this decision brief the DMT will present the

recommendation, with support from the stakeholder. The DRPM AAA will decide to approve, reject, or defer any path forwards. The DMT will document the results of this decision brief using the meeting minutes form.

9.7 DMT Concurrence and DRPM AAA Approval Decision

The PIA is responsible for recording the findings of the DMT and DRPM AAA on all matters related to DMSMS. When the DRPM AAA rejects or defers the business case, the PIA returns it to the proponent for further re-evaluation and resubmission, as appropriate.

9.8 Generate ECR or RECR

When a path forward for resolving an obsolescence issue is approved by the DRPM AAA then the D-Level Lead should initiate an ECR or RECR in accordance with PD-1006 (Change Management) or PD-1220 (Retrofit Change Management).

9.9 Secure Funding for Verification

Once the engineering change request (ECR) or retrofit engineering change request (R-ECR) is approved by the CCB then the DMT, in conjunction with the stakeholder, will secure funding necessary to verify the solution, in accordance to PD-1216 (Program Downselect of Competing Unfunded Priorities).

9.10 Procure and Test Verification Solution to Resolve Issue

Once funding has been secured in accordance to PD-1216 (Program Downselect of Competing Unfunded Priorities) then the stakeholder should procure adequate test hardware and/or software to verify that the obsolescence solution will work. Verification may be accomplished by test, modeling, analysis, demonstration, or inspection.

9.11 Secure Funding for Final Solution

Once the candidate solution has been verified then the DMT, in conjunction with the stakeholder, will secure funding necessary to resolve the obsolescence issue, in accordance to PD-1216 (Program Downselect of Competing Unfunded Priorities).

9.12 Procure Final Solution to Resolve Issue

After funding has been secured, a buyer shall find a qualified vendor and order sufficient quantities to redress the obsolescence issue within the constraints of available budget.

9.13 Implement Scheduled Maintenance and Technology Insertion

The DMT will notify the SM/TI Lead when the change would be available for vehicle integration.

Once a solution is approved by the CCB and implemented by the SM/TI then the DMSMS business case will be closed in the OMIS.

9.14 Expedited Decision-Making by DRPM AAA

As previously stated the EFV DMSMS program intends to be pro-active in the forecasting and remediation of obsolescence issues well in advance of their occurrence.

The process defined in Sections 9.1 through 9.13 addresses the decision-making process and 120 day BCA development and approval timeline for mitigation of DMSMS risk under circumstances when the EFV has not been fielded and does not incur operational availability downtime as a result of obsolescence or material shortages.

Once the EFV has been fielded and the EFV is subject to a DMSMS operational availability downtime scenario it is planned to get a one-day turnaround on the path forward to resolve the DMSMS issue. This will be accomplished by the DMT developing a BCA in the morning, and conducting a combined Integrating IPT/Joint-Program Management Team in the afternoon. At the Integrating IPT/Joint-Program Management Team are all members of the DMT as well as the DRPM AAA and Vice President for the PIA. This meeting will be conducted as a decision-brief with an approved implementation path forward being documented. The appropriate subject matter expert will be responsible for the execution of the path forward with the DMT monitoring its implementation.

APPENDIX A
TRACEABILITY MATRIX OF DRPM AAA DMSMS MANAGEMENT PLAN TO ASN(RDA) AND NAVSO P-3692, INDEPENDENT LOGISTICS ASSESSMENT, DMSMS GUIDANCE AND DIRECTION

Requirement	Source	EFV DMSMS Management Plan Section
DMSMS plan cover all phases of the lifecycle, from program initiation through sustainment and disposal	ASN (RDA) memo 27 Jan 05	5.1, EFV Systems Acquisition Lifecycle; 5.3, Budgeting and Funding; 5.4.2.3, LRIP Contract Language; 5.5.1, Analyses Conducted to Support Decision-Making Process
Integrate DMSMS strategies with techology roadmaps	ASN (RDA) memo 27 Jan 05	5.2, DMT Strategies and Approaches; 5.2.1, Proactive Management; 5.3, Budgeting and Funding; 5.3.1, Life Cycle Cost Estimates and POM Inputs for DMSMS; 6.0, DMSMS and EFV Technology Roadmap
Utilize configuration data (e.g., bill of materials, preferred parts lists)	ASN (RDA) memo 27 Jan 05	5.4.6, Proprietary and Data Rights; 7.0, EFV Configuration Management and BOM Data Management; 7.2, Parts List Review / Prioritization; 7.4, BOM CM Data
Identify and forecast piece part obsolescence impacts and mitigations for all configurations	ASN (RDA) memo 27 Jan 05	5.2, Proactive Management; 5.3, Budgeting and Funding; 7.1, Configuration Item Identification/Analysis; 7.4, BOM CM Data; 9.1, Identify Obsolescence Issue
Use predictive cost-effective industry solutions that reduce DMSMS risk and enhance performance	ASN (RDA) memo 27 Jan 05	5.2.1, Proactive Management; 7.4, BOM CM Data; 9.5.14, Operational Availability Analysis; Appendix F, EFV DMSMS Tools Suite, OMIS
Identify systems that utilize the same components and technologies, and establish commodity management and preferred material processes to standardize use of like materials across programs	ASN (RDA) memo 27 Jan 05	5.6, Standardization and Commonality
Provide and utilize documentation and metrics that track DMSMS cases and trends, associated solutions and costs	ASN (RDA) memo 27 Jan 05	4.3, DMSMS Management Team; 5.2.1, Proactive Management; 5.2.2, DMT Administration; 5.4.1, Incentives; 5.4.3, Deliverables; 5.4.4, Metrics; Appendix D, EFV DMSMS Metrics
Assess the contractors' DMSMS programs and ensure that they meet program requirements. This should include consideration of a DMSMS management incentive clause	ASN (RDA) memo 27 Jan 05	5.4.1, Incentives; 5.4.2.1, Production Readiness Review; 5.4.2.2, Critical Design Review; 5.5, DRPM AAA Management Oversight of PIA DMSMS Program

Requirement	Source	EFV DMSMS Management Plan Section
Utilize Business Case Analyses to support DMSMS decisions	ASN (RDA) memo 27 Jan 05	5.2.1, Proactive Management; 5.3.1, Life Cycle Cost Estimates and POM Inputs for DMSMS; 5.4.3, Deliverables; 9.3, Initiate DMT Business Case; 9.5, Complete DMT Business Case; 9.6, DMT Business Case Review
Manage obsolescence at the piece part level for all active microelectronics	ASN (RDA) memo 27 Jan 05	1.1, Purpose; 7.1, Configuration Item Identification / Analysis
Ensure Performance Based Logistics agreements address mitigation of DMSMS risk to the program and government	ASN (RDA) memo 27 Jan 05	4.3.1, Objectives of DMT; 5.2, DMT Strategies and Approaches; 5.4.1, Incentives; 5.4.5, Exit Criteria
Guidance and/or requirements should be documented in a parts and materials design guide before the start of the design, addressing parts selection, derating and testability factors. Adherence to the guidelines should be verified at design reviews.	NAVSO P-3692, ILA Handbook, Dec 03	5.1, EFV Systems Acquisition Lifecycle; 5.4.2.1, Production Readiness Review; 5.4.2.2, Critical Design Review; 5.7, Design Rules
Identification of COTS/NDI reliability is required.	NAVSO P-3692, ILA Handbook, Dec 03	5.2.1, Proactive Management; 5.6, Standardization and Commonality; 7.4.1, BOM Data Information; 9.4, Analyze Obsolescence Issue Options
Parts and materials selected are qualified to the worst case DRMP and detail design environments. Uprating or upscreening of parts is not a best practice and should not be performed.	NAVSO P-3692, ILA Handbook, Dec 03	5.7, Design Rules
Parts derating is required for all electronic, electrical components. Electrical parameters are characterized to requirements derived from the DRMP to ensure that all selected parts are reliable for the proposed application	NAVSO P-3692, ILA Handbook, Dec 03	5.7, Design Rules
Highly integrated parts are used to reduce the number of individual discrete parts / chips, the number of interconnections, size, power consumption and cooling requirements, failure rates	NAVSO P-3692, ILA Handbook, Dec 03	5.7, Design Rules
The critical items list has been developed and includes any item of high technical risk with no workaround, items with schedule or delivery risk, sole source items, high failure rate items, safety of flight items	NAVSO P-3692, ILA Handbook, Dec 03	4.3.1, Objectives of DMT; 5.2, DMT Strategies and Approaches; 5.2.1, Proactive Management; 5.4.2.2, Critical Design Review; 5.4.3, Deliverables; 6.0, DMSMS and EFV Technology Roadmap; 7.1, Configuration Item Identification Analysis; 7.2, Parts List Review/Prioritization; 7.4, BOM CM Data; 9.5.1.5, Industrial Base Analysis; 9.6, DMT Business Case Review
COTS/NDI parts and their applications meet DRMP	NAVSO P-3692, ILA Handbook, Dec 03	5.2.1, Proactive Management; 5.6, Standardization and Commonality; 7.4.1, BOM Data Information; 9.4, Analyze Obsolescence Issue Options

Requirement	Source	EFV DMSMS Management Plan Section
A formal DMSMS program has been established. This should contain a system technology roadmap, initiated at Milestone A, that includes identification of critical items and technologies, identification of emerging technologies, DMSMS forecast integrated into technology refresh planning.	NAVSO P-3692, ILA Handbook, Dec 03	5.2, DMT Strategies and Approaches; 5.2.1, Proactive Management; 5.3, Budgeting and Funding; 5.3.1, Life Cycle Cost Estimates and POM Inputs for DMSMS; 6.0, DMSMS AND EFV Technology Roadmap
Technology insertion/refresh, if used to mitigate obsolescence, includes a formal plan/strategy to specifically identify DMSMS insertion/refresh requirements, established intervals agreed to by the program sponsor, approved funding plan over the system life cycle for each scheduled insertion/refresh	NAVSO P-3692, ILA Handbook, Dec 03	5.2, DMT Strategies and Approaches; 5.2.1, Proactive Management; 5.3, Budgeting and Funding; 5.3.1, Life Cycle Cost Estimates and POM Inputs for DMSMS; 6.0, DMSMS AND EFV Technology Roadmap
DMSMS forecasting/management tools and or service providers have been research and selected	NAVSO P-3692, ILA Handbook, Dec 03	5.2.1, Proactive Management; 7.4, BOM CM Data; 9.5.14, Operational Availability Analysis; Appendix F, EFV DMSMS Tools Suite, OMIS
Forecasting for obsolescence and product timelines has been conducted and considers product (revisions and generation/technology changes), supplier base, contract period and life cycle	NAVSO P-3692, ILA Handbook, Dec 03	5.1, EFV Systems Acquisition Lifecycle; 5.2.1, Proactive Management; 5.4.2, Implications for Source of Supply; 5.4.2.1, Production Readiness Review; 5.4.2.3, LRIP Contract Language; 5.4.6, Proprietary and Data Rights Issues; 6.0, DMSMS and EFV Technology Roadmap; 7.3, Periodic Market Assessment; 7.4, BOM CM Data; 7.6, Trade-Off Analysis; 9.1, Identify Obsolescence Issue, 9.5, Complete DMT Business Case; 9.5.14, Operational Availability Analysis; Appendix F, EFV DMSMS Tools Suite, OMIS
On-going review of the parts lists and BOM to identify obsolescence/discontinuance issues is conducted	NAVSO P-3692, ILA Handbook, Dec 03	5.2.1, Proactive Management; 5.3, Budgeting and Funding; 5.4.3, Deliverables; 7.5, DMT and CCB

Requirement	Source	EFV DMSMS Management Plan Section
A strategy for DMSMS design and manufacturing documentation has been developed and considers design disclosed items, including sub-tier hardware indenture levels; form fit function/proprietary design items, including sub-tier hardware indenture levels	NAVSO P-3692, ILA Handbook, Dec 03	5.2, DMT Strategies and Approaches; 5.2.1, Proactive Management; 5.3, Budgeting and Funding; 5.4.3, Deliverables; 7.5, DMT and CCB
The design approach minimizes impact of DMSMS by addresssing open systems architecture, order of precedence for parts selection, the requirement for a preferred parts list and parts control prior to detailed design to minimize obsolescence issues, identification of shelf and operating life requirements, identification of technology life expectencies	NAVSO P-3692, ILA Handbook, Dec 03	5.1, EFV Systems Acquisition Life Cycle; 5.2, DMT Strategies and Approaches; 5.2.1, Proactive Management; 5.3, Budgeting and Funding; 5.3.1, Life Cycle Cost Estimates and POM Inputs for DMSMS; 6.0, DMSMS AND EFV Technology Roadmap; 7.2, Parts List Review/Prioritization
DMSMS Business Case Analysis is performed as part of trade-studies to determine return on investment on mitigation actions	NAVSO P-3692, ILA Handbook, Dec 03	5.2.1, Proactive Management; 5.3.1, Life Cycle Cost Estimates and POM Inputs for DMSMS; 5.4.3, Deliverables; 7.6, Trade-Off Analysis; 9.3, Initiate DMT Business Case; 9.5, Complete DMT Business Case; 9.6, DMT Business Case Review
Obsolescence life cycle mitigation strategy is defined	NAVSO P-3692, ILA Handbook, Dec 03	5.1, EFV Systems Acquisition Lifecycle; 5.3, Budgeting and Funding; 5.4.2.3, LRIP Contract Language; 5.5.1, Analyses Conducted to Support Decision-Making Process
DMSMS life cycle cost and cost avoidance has been estimated	NAVSO P-3692, ILA Handbook, Dec 03	5.3.1, Life Cycle Cost Estimates and POM Inputs for DMSMS; 5.4.4, Metrics; 7.6, Trade-Off Analysis; 8.0, EFV DMSMS Data Management Architecture; 9.5.1.4, Operational Availability Analysis
Current and out-year budget established/planned based on DMSMS forecast, tracking and mitigation efforts	NAVSO P-3692, ILA Handbook, Dec 03	5.3, Budgeting and Funding; 5.3.1, Life Cycle Cost Estimates and POM Inputs for DMSMS; 9.12, Procure Final Solution to Resolve Issue

Requirement	Source	EFV DMSMS Management Plan Section
Funding shortfalls and impact are identified, prioritized and documented	NAVSO P-3692, ILA Handbook, Dec 03	5.3.1, Life Cycle Cost Estimates and POM Inputs for DMSMS; 5.4.2.3, LRIP Contract Language; 7.2, Part List Review / Prioritization; 9.5, Complete DMSMS Business Case; 9.10, Procure and Test Verification Solution to Resolve Issue
Contractual data requirements define contractor vs Government life cycle DMSMS tasks and responsibilities	NAVSO P-3692, ILA Handbook, Dec 03	4.3, DMSMS Management Team; 4.4, EFV DMSMS IPT; 5.5, DRPM AAA Management Oversight of PIA DMSMS Program
Contractual data requirements define DMSMS incentives/awards	NAVSO P-3692, ILA Handbook, Dec 03	5.4.1, Incentives
Contractual data requirements define decision on ownership of product/technical data package rights and COTS licensing agreements	NAVSO P-3692, ILA Handbook, Dec 03	5.4.5, Exit Criteria; 5.4.6, Proprietary and Data Rights Issues
Contractual data requirements define PBL/TSPR strategy for legacy system DMSMS	NAVSO P-3692, ILA Handbook, Dec 03	4.3.1, Objectives of DMT; 5.2, DMT Strategies and Approaches; 5.4.1, Incentives; 5.4.5, Exit Criteria
Contractual data requirements define DMSMS planning and mitigation requirements	NAVSO P-3692, ILA Handbook, Dec 03	5.1, EFV Systems Acquisition Lifecycle; 5.2, DMT Strategies and Approaches; 5.2.1, Proactive Management; 5.3, Budgeting and Finance; 5.3.1, Life Cycle Cost Estimates and POM Inputs for DMSMS; 5.4.2, Implications for Source of Supply; 6.0, EFV and DMSMS Technology Roadmap; 7.1, Configuration Item Identification/Analysis; 7.2, Parts List Review/Prioritization; 7.3, Periodic Market Assessment; 7.4, BOM Configuration Management Data; 9.0, EFV DMSMS Resolution Process

Requirement	Source	EFV DMSMS Management Plan Section
Contractual data requirements define system architecture/design to minimize obsolescence costs	NAVSO P-3692, ILA Handbook, Dec 03	4.1, DMSMS Management Team Policy; 4.2, DMSMS Management Team Mission; 5.2, DMT Strategies and Approaches; 5.4, Contractual Requirements; 5.4.1, Incentives; 5.4.4, Metrics; 7.3, Periodic Market Assessment; 9.5.1, Analyses Conducted to Support Decision-Making Process
Contractual data requirements define DMSMS production, repair, procurement capability including hardware and software support and test equipment, tooling and fixtures and chip and die availability and storage	NAVSO P-3692, ILA Handbook, Dec 03	5.4.2.1, Production Readiness Reviews
Contractual data requirements define supply chain monitoring/management including contractor, vendor notification of pending parts obsolescence and part/firmware changes	NAVSO P-3692, ILA Handbook, Dec 03	5.3.1, Life Cycle Cost Estimate and POM Inputs for DMSMS; 5.4.2.1, Production Readiness Review; 7.1, Configuration Item Identification/Analysis; 7.3, Periodic Market Assessment; 9.2, Verify and Document
Contractual data requirements define configuration management to the appropriate obsolescence mitigation levels	NAVSO P-3692, ILA Handbook, Dec 03	5.4.6, Proprietary and Data Rights; 7.0, EFV Configuration Management and BOM Data Management; 7.2, Parts List Review / Prioritization; 7.4, BOM CM Data
Contractual data requirements define DMSMS database established and maintenance through an Integrated Digital Data Environment concept of operations that supports the total life cycle management of the product	NAVSO P-3692, ILA Handbook, Dec 03	8.0, EFV DMSMS Data Management Architecture
Contractual data requirements define TDP that supports the DMSMS mitigation strategy - specifications, technical manuals, engineering drawings/product data models that provide appropriate levels of detail for reprocurement, maintenance and manufacture of the product	NAVSO P-3692, ILA Handbook, Dec 03	5.1, EFV Systems Acquisition Lifecycle; 5.4, Contractual Requirements
Contractual data requirements define TDP that supports the DMSMS mitigation strategy - special instructions for items such as unique manufacturing, quality and test processes, preservation and packaging	NAVSO P-3692, ILA Handbook, Dec 03	5.1, EFV Systems Acquisition Lifecycle; 5.4, Contractual Requirements
Contractual data requirements define TDP that supports the DMSMS mitigation strategy - VHDL documentation of digital electronic circuitry	NAVSO P-3692, ILA Handbook, Dec 03	5.1, EFV Systems Acquisition Lifecycle; 5.2.1, Proactive Management

Requirement	Source	EFV DMSMS Management Plan Section
Contractual data requirements define TDP that supports the DMSMS mitigation strategy - the version, release, change status and other identification details of each deliverable item	NAVSO P-3692, ILA Handbook, Dec 03	7.4, BOM CM Data; 7.4.1, BOM Data Information
Contractual data requirements define program, design and production readiness reviews of contractor management effectiveness	NAVSO P-3692, ILA Handbook, Dec 03	5.4.2.1, Production Readiness Reviews; 5.4.2.2, Critical Design Reviews; 5.4.2.3, LRIP Contract Language; 5.4.3, Deliverables; 5.4.4, Metrics; 5.4.5, Exit Criteria; 5.5, DRPM AAA Management Oversight of PIADMSMS Program
Contractual data requirements define provisioning screening required for maximum use of existing supply lines	NAVSO P-3692, ILA Handbook, Dec 03	5.2.1, Proactive Management; 7.3, Periodic Market Assessment; 9.3, Initiate DMT Business Case
DMSMS considerations are incorporated into the integrated logistics support plan and post production support plan	NAVSO P-3692, ILA Handbook, Dec 03	5.2, DMT Strategies and Approaches; 8.0, EFV DMSMS Data Management Architecture
Items that are single source and those for which the Government cannot obtain data rights and the associated corrective action plans are identified	NAVSO P-3692, ILA Handbook, Dec 03	5.4.6, Proprietary and Data Rights
Strategies to resolve potential DMSMS problems are established	NAVSO P-3692, ILA Handbook, Dec 03	7.6, Trade-Off Analysis; 9.4, Analyze Obsolescence Issue Options
A program manager/naval supply systems command reprocurement engineering support agreement is in place	NAVSO P-3692, ILA Handbook, Dec 03	5.6, Standardization and Commonality
Monitoring of usage and anticipated demand vs items available for DMSMS mitigation planning throughout the items life cycle	NAVSO P-3692, ILA Handbook, Dec 03	5.1, EFV Systems Acquisition Lifecycle; 5.4.2, Implications for Source of Supply; 7.2, Parts List Review/Prioritization; 7.3, Periodic Market Assessment

APPENDIX B
LIST OF ACRONYMS

AAV	Assault Amphibian Vehicle
ACAT	Acquisition Category
ASN(RDA)	Assistant Secretary of the Navy for Research, Development and Acquisition
BCA	Business Case Analysis
BEA	Break-Even Analysis
BER	Beyond Economical Repair
BOM	Bill of Material
CAGE	Commercial and Government Entity
CCB	Configuration Control Board
CDR	Critical Design Review
CD-ROM	Compact Disc Reader Only Memory
CL	Checklist
CM	Configuration Management
COE	Center of Excellence
COTS/GOTS/MOTS	Commercial-Off-The-Shelf, Government-Off-The-Shelf, Modified-Off-The-Shelf
CPD	Capabilities Production Document
DASN(L)	Deputy Assistant Secretary of the Navy for Logistics
DCMA	Defense Contract Management Agency
DI MGMT	Data Item, Management
DI MISC	Data Item, Miscellaneous
DLA	Defense Logistics Agency
DMEA	Defense Microelectronics Activity
DMSMS	Diminishing Manufacturing Sources and Material Shortages
DMT	DMSMS Management Team
DoD	Department of Defense
DoN	Department of the Navy
DPAS	Defense Priorities and Allocations System
DRPM AAA	Direct Reporting Program Manager Advanced Amphibious Assault
DSCC	Defense Supply Center Columbus
DSCR	Defense Supply Center Richmond
ECP	Engineering Change Proposal
ECR	Engineering Change Request
EFV	Expeditionary Fighting Vehicle
EFV (C)	EFV Command Variant
EFV (P)	EFV Personnel Variant
F^3I	Form, Fit and Function Interface
FED LOG	Federal Logistics Information System
FFF	Fit, Form, Function
F^3I	Form, Fit, and Function Interface
FLIS	Federal Logistics Information Service
FM	Form

FRP	Full Rate Production
FY	Fiscal Year
GFE	Government Furnished Equipment
GIDEP	Government-Industry Data Exchange Program
GL	Guideline
GOTS	Government-Off-The-Shelf
HEU	Hull Electronics Unit
IBA	Industrial Base Analysis
IAC	Industrial Analysis Center
ILA	Independent Logistics Assessment
ILS	Integrated Logistics Support
IOC	Initial Operational Capability
IPT	Integrated Product Team
ISO	International Standards Organization
JTA	Joint Technical Architecture
LOLA	Logistics On-Line Access
LOT	Life-of-Type
LRIP	Low Rate Initial Production
LRU	Lowest Replaceable Unit
MCCDC	Marine Corps Combat Development Command
MOE	Measures of Effectiveness
MOTS	Modified-Off-The-Shelf
MPU	Multiple Processor Unit
NAVSEA	Naval Sea Systems Command
NAVSO	Navy Supply Organization
NBC	Nuclear, Biological and Chemical
NDI	Non-Developmental Item
NHA	Next Highest Assembly
NUWC Keyport	Naval Undersea Warfare Center, Keyport
OEM	Original Equipment Manufacturers
OIA	Operational Impact Analysis
OMIS	Obsolescence Management Information System
P^3I	Pre-Planned Product Improvement
PBA	Performance Based Agreement
PBL	Performance Based Logistics
PD	Program Directive
PIA	Program Integration Agent
POM	Program Objective Memorandum
PRR	Production Readiness Review
Q-STAR	QinetiQ's - Sustainment Technology Assessment Resource
RE	Reverse Engineering
RECR	Retrofit Engineering Change Request
RFI	Request For Information
ROI	Return on Investment
RSI	Rationalization, Standardization and Interoperability
SAE	Service Acquisition Agent
SCD	Source Control and Vendor Item Drawings
SDD	System Design and Development

SECNAV	Secretary of the Navy
SECNAVINST	Secretary of the Navy Instruction
SEP	Systems Engineering Plan
SM/TI	Scheduled Maintenance/Technology Insertion
SOW	Statement of Work
SRU	Service Replaceable Unit
S/SS	System/Subsystem Specification
STD	Standard
TDP	Technical Data Package
TLCSM	Total Life Cycle Systems Management
TOC	Total Ownership Cost
TSS	Total System Support
VHDL	Very High Speed Integrated Circuit (VHSIC) Hardware Definition Language
WebCATS	Web Customer Account Tracking System
WI	Work Instruction

APPENDIX C
GLOSSARY OF TERMS AND DEFINITIONS

Aftermarket -- Aftermarket or alternate sources are entities that buy production lines and/or products deemed obsolete by the OEM. The alternate source companies retain/maintain a capacity to provide/produce some DMSMS parts. Many OEMs establish agreements with aftermarket sources for product life cycle extension. The DMSMS IPT will consider this option if part specifications and test, acceptance, and related technical data are complete and available, ensuring the alternate source parts meet or closely parallel original item specification requirements. The DMSMS IPT will investigate the possibility of establishing an extended buy from these suppliers or negotiating a long-term parts supply agreement. Aftermarket or alternate source manufacturer price per unit costs are very sensitive to order quantities. The DMT will consider this fact developing a procurement strategy for this alternative. If part specifications and test, acceptance, and related technical data are complete and available, aftermarket manufacturers may support continued production of DMSMS items. The DMT will compile a TDP, including final acceptance test and qualification requirements, for the DMSMS item. The DMT will coordinate with OEM and engineering activities, through Contracts, to validate adequacy and accuracy of technical information. If a full data package is not available, the DMT will assess the cost of procuring or developing a sufficient TDP to support the aftermarket analysis. The DMT will identify aftermarket firms and validate production capabilities. The DMT may use catalogs that identify products and technologies, and provide detailed cross-references to original OEM part numbers. The DMT may coordinate directly with OEMs/vendors, through Contracts, to assist in locating suitable aftermarket sources. Once identified, the DMT will evaluate supplier capabilities, production and qualification requirements, and assess production plans for the expected duration of DMSMS item procurements. If aftermarket firms are not qualified to the proper level of the original item specification, an engineering analysis may be appropriate to determine potential for waiving selected requirements to allow approval of the aftermarket part. The DMS IPT will enlist the help of the engineering community to perform this analysis. The DMT may evaluate feasibility and cost of qualifying supplier facilities to the desired level. If appropriate, the DMT will request bids from aftermarket activities for designated quantities of DMSMS items, and determine material production and delivery schedules. The DMT will develop the total LOT cost of the resolution. This may include TDP, source qualification, LOT cost of the DMSMS item (including testing). The analyst will also estimate the cost of documentation changes if engineering change proposals (ECPs)/waivers are required. The DMSMS IPT will determine if an engineering analysis is appropriate.

Contractor Maintained Inventory -- This resolution would require the PIA, through PIA agreements, to maintain an inventory of DMSMS items for future DoD needs. This option shall be weighed against the cost of the DoD maintaining an inventory and furnishing the items as government furnished equipment (GFE). This alternative is very similar to the LOT Buy alternative, except that the PIA is maintaining the inventory, not the government. Also, this option has the PIA procuring the required inventory with their own funds, and selling them to the government as the government's need arises. In the case of a LOT buy, the government is usually the one to spend the funds to procure the entire LOT quantity up front while it is still available.

Defense Priorities and Allocations System -- In cases where a production discontinuance has the potential to delay delivery schedules and thereby impact national security requirements, the DMSMS analyst will consider application of procedures under the DPAS system as directed by DoD 4410.1M.

DPAS procedures authorize the President to:

- Require acceptance of defense contracts and orders
- Require priority performance on defense contracts and orders
- Control scarce and critical materials essential to national defense
- Allocate materials and resources to promote national defense
- Direct distribution of materials essential for the national defense

DPAS will not be considered as a loophole for defusing DMSMS problems. However, in cases where unreasonably short discontinuance notices are provided and national security requirements may be at stake, application of DPAS procedures may be appropriate. DPAS is to be considered as an "emergency" measure to resolve DMSMS problems. Based on critical DoD requirements, vendors having manufactured products for DoD may be compelled to continue production for a limited time under certain conditions.

Develop New Source -- Development of new sources for DMSMS items may be considered when a full re-procurement TDP is owned or may be purchased by the government. This alternative may be most appropriate when the DMSMS problem occurs at either the equipment or component level, and the LOT demand is projected to be high. For electronics items, emulation or aftermarket manufacture will be evaluated prior to assessing this option. New sources may include both government and commercial organizations. The DMT, with engineering support, will assess the availability and adequacy of the DMSMS item TDP to support source set-up and manufacturing/testing requirements. If the government does not currently own the data, the DMT will need to determine costs and schedules for data acquisition. The DMT may revisit contacts established during the preliminary manufacturer query and request a letter of interest from leading manufacturers. These manufactures may also assist in identifying other potential companies that may consider making DMSMS parts. The DMT will also coordinate with representatives from government manufacturing programs to assess in-house capabilities. The DMT, with engineering support, will provide technical data, drawings, and any other information necessary to allow manufacturer feasibility, production and cost analyses. The DMT will request technical/cost proposals and production and delivery schedules for manufactured items. The DMT will develop LOT costs for this alternative, including TDP, source set-up and qualification and LOT material requirements.

Emulation -- Emulation is the process of developing Form, Fit, and Functional (FFF) replacements for obsolete parts. Emulated items are not technically substitutes for original items, but rather valid alternate parts for the non-available components. However, a risk does exist in that emulated parts may fail to meet certain unspecified performance characteristics of the original item, and thus suitability for all applications may not be guaranteed. As with aftermarket manufacturers, price per unit for emulated items is likely to be extremely sensitive to order quantities. The DMT will consider this fact developing a procurement strategy for this

alternative. The emulation process may be conducted at the integrated circuit, circuit card, or other designated system indenture level, and is therefore often considered a subset of redesign initiatives. The EFV DMSMS analyst will present the need for emulation to the DMT to coordinate engineering support and assess cost factors associated with emulation requirements. Emulation is currently only possible if the item under analysis meets specific physical or functional characteristics with regard to technology type, operating voltage, temperature range, pin and gate count, and other designated parameters. The DMT will contact prospective emulation activities to determine whether the part is an emulation candidate. The DMT will assess availability and adequacy of part technical data and specifications, including item testing and qualification requirements, to support the emulation process. An accurate and complete part specification is essential to ensure the emulated product matches all of the characteristics of the original device. This specification will be developed, if possible, from existing government and commercial documentation, as well as existing devices. The DMT will coordinate with OEM's to obtain final acceptance test procedures or other essential specification requirements. If a complete TDP is not available, the DMT will evaluate the feasibility/cost of purchasing or developing the necessary TDP. The DMT will identify candidate emulation firms and provide the technical data necessary to conduct emulation feasibility analysis (as required). The proposed emulation approach and associated material production and delivery schedules must be validated. Emulation firms may not maintain item qualification capabilities to the MIL-SPEC or MIL-STD level of the original item specification, and the potential for waiving specifications or funding qualification of the potential source may need to be evaluated. The DMT will request bids from selected emulation activities for designated quantities of DMSMS items, ensuring consideration of varying order quantities to support volume price breaks. The DMT will develop the total cost of this alternative, including: technical data/specification development; source qualification; LOT DMSMS material; item test/acceptance costs (including module/end item drop-ins and full system integration testing as required); engineering/logistics data revisions; and material handling/storage (if volume procurements are anticipated).

Form, Fit, and Function Interface (F^3I) -- Form, Fit, and Function Interface (F^3I), Performance Based Specification Conversion approach involves converting detailed design of the item(s) to Performance Specifications. As stated in DoD 5000.1, Performance Specifications may include DoD performance specs, NDI COTS/GOTS/MOTS, and non-government performance standards. Once F^3I is selected as the resolution method, the specification package is provided for production. This DMSMS solution may be utilized unless one of the following conditions exists: F^3I, performance based specifications are not applicable; an alternative solution is more cost effective over the entire life cycle; an alternative solution has a lower impact to overall system schedule Results are to be documented in the EFV DMSMS information system/case history file. If the DMT determines that there are no FFF identical items available to replace the DMSMS part, other resolution options will be analyzed. If a FFF part is available and is expected to remain in production, the analyst will present the analysis results to the DMT for action. If an FFF part is available but is projected as another DMSMS problem, the DMT will evaluate the need for a LOT buy. Should a LOT buy be required, the DMT will present the information garnered during this portion of the analysis effort to the DMT for further consideration.

Incentivization -- Incentivization involves convincing the existing source to continue production of the DMSMS item(s). To determine if the existing source is willing to continue production, the question is, "Are there actions the government could take to encourage the OEM to continue to

produce the item?" The reviewer has to decide if the government could take action, which would entice the OEM to continue production. Sample actions include price incentives; quantity guarantees; etc. The reviewer makes inquiries, but negotiations have to be done by a contracting officer. Results will be documented in the EFV DMSMS information/case history file.

Interchangeability -- A condition which exists when two or more items possess such functional and physical characteristics as to be equivalent in performance and durability, and are capable of being exchanged one for the other without alteration of the items themselves, or of adjoining items, except for adjustment, and without selection for fit and performance.

Life of Type Buy -- LOT is essentially the projected total number of requirements for all possible applications needed throughout the life of a system. The DMT will assess LOT application requirements since selection of a viable DMSMS resolution alternative requires development of the projected lifetime demand for the item in question. This will include demands for current and planned production quantities, planned engineering changes, installation and checkout spares, maintenance assistance modules (if necessary), and all in-service system repairs and life cycle support needs. Projected LOT requirements will be an integral consideration when recommending case resolutions. This alternative involves purchasing a supply of DMSMS items to support total demands for the life of impacted systems/equipment. The LOT buy option may involve purchase of any items or materials essential to continued production or repair of the DMSMS item. LOT buys have traditionally been a common resolution alternative, but are no longer routinely preferred due to the difficulty in accurately predicting lifetime demand requirements. They can be advantageous if quick response is required, or may be modified to serve as interim remedies while other options are pursued. When available, LOT buy costs will be developed as a baseline for comparison with other options. The DMT will estimate costs associated with a LOT procurement of each substitute candidate by projecting timeframes for item review, approval, and availability, including engineering analysis, source qualification requirements (if necessary), price of substitute items, testing, and associated engineering and logistics documentation changes.

Product Warranty -- This resolution would require the OEM to provide the item or items for a specified time (life of equipment) irrespective of supply demands. This alternative is similar to contractor maintained inventory, except that the quantity is not defined, only the contract duration. Results will be documented in the EFV DMSMS Information system/case history file.

Reclamation -- Reclamation is the cannibalization or "harvesting" of parts from assemblies no longer used by military or commercial activities. Reclamation is most effective when a supply of end items has been identified and resources are available for recovery, testing, repackaging, and storage. Potential sources for this alternative include Beyond Economical Repair (BER) equipments at depot repair facilities; surplus and stored material removed due to modernization programs; or items resident within deactivated or decommissioned units. The DMT will consider this option primarily to resolve crisis DMSMS situations, as a short-term resolution alternative, or in cases where remaining LOT demand is minimal. The DMT will also ensure all tangential efforts and costs associated with a reclamation effort are considered. The DMT will investigate sources for the reclamation option when deemed appropriate via depot repair and storage facilities known to be repositories of BER or surplus material, Defense Logistics Agency (DLA) activities, or other DoD supply and logistics organizations.

Redefining Requirement to Accept NDI COTS/GOTS/MOTS -- Working through the appropriate engineering support activities, redefine the requirement to accept a commercial item. This could lead to the emergence of additional sources. The process is similar to the substitution alternative, except you are redefining the item to accept a commercial item already available. It is important to remember when selecting COTS/GOTS/MOTS items that the spectrum of those items in quality and technical specifications is broad. The design limits, environmental profiles, and life cycles vary. General categories of commercial items include consumer, industrial, automotive, and specialty items. The characteristics of these items must be understood and evaluated carefully to ensure that the selected COTS/GOTS/MOTS part meets the needs of the military application.

Redesign -- This alternative involves designing-out DMSMS items via engineering changes at various system indenture levels, with the goals of enhancing system performance and improving reliability and maintainability. An increasingly common type of redesign, known as Technology Refresh, entails development of fit-transparent replacements for aging electronics technologies primarily at the component and board level. As in previous alternatives, redesigns at the component or LRU level may involve significant risk if the item in question has multiple different applications, and extensive system integration testing may be required. Moreover, depending on the scope and level of the redesign effort, substantial non-recurring engineering and life cycle logistics costs may accrue. Given the relative magnitude of engineering and logistics cost factors, redesigns may be most appropriate when a fairly large percentage of current or potential DMSMS parts are resident within a particular component, equipment, or end-item. As in previous alternatives, redesigns at the component or assembly may involve significant risk and extensive system integration testing if the item in question has multiple different applications. Moreover, depending on the scope and level of the redesign effort, substantial nonrecurring engineering and life cycle logistics costs may accrue. Redesigns may be most appropriate when a fairly large percentage of current or potential DMSMS parts are resident within a particular component, equipment, or end-item. The DMT will enlist the support of and coordinate efforts with the engineering community to assess the need and viability of redesigning or modifying the item under analysis or any other subsystem or units of the system. Replacing an obsolete or discontinued item often can extend the life of a NHA and / or result in enhanced performance. In addition, it may be more economical to replace the item or the NHA than to use another method to resolve the problem. Replacement with newer technology or replacements of NHA's are two common replacement options. Replacement of a higher assembly is not limited to the next higher assembly. For example, an entire subsystem may be replaced with a newer, more enhanced one rather than continuing to replace board or part level discontinued items on the original unit. As indicated in the previous alternative, this option is touched upon within the context of other alternatives such as substitution. In cases where replacing the DMSMS item itself is cost, time or design prohibitive, consider the replacement of the next higher assembly as an alternative. For example, replacements at the board level may be a better option than replacement of an individual chip. With the continual improvement of technology, many serviceable technologies become obsolete rather than nonfunctional. They may rapidly go out of production in favor of the newer, enhanced technology. Replacing these items with the newer counterpart if it meets form, fit, function and interface requirements may be an easy and cost effective solution. The DMT will, with the support of the engineering community, perform a review of specifications to ensure obstacles to use of the new technology are not artificial (i.e. created by the limits of technology available at the time). Enhanced performance may be achievable through exercising this alternative. When evaluating this option,

design analysis may be necessary to ensure the newer technology does not introduce functional performance problems (i.e. using a higher speed device may result in timing problems, a lower voltage device may be susceptible to noise in supply voltage, etc.). If an alternative source is found, but the supplier does not have a qualified product or production line, cost and schedule impact associated with qualifying the source will be included as part of the assessment.

Reverse Engineering -- Reverse Engineering (RE) is the process of developing exact replicas of candidate items through review of available technical data and physical disassembly and analysis of item components. RE may be appropriate when the government does not possess sufficient technical data or data rights to support re-procurement. The goal is to cultivate qualified alternate sources and provide the basis for competitive acquisitions through development of a full procurement data package. The RE process has traditionally been fairly expensive, but may be used for cost or technical comparison with redesign or other solutions. The DMT will coordinate available item technical and procurement data, and ensure availability of sample items for analysis and disassembly during the RE process. With support from the engineering community, the DMT will identify industrial or government concerns with the potential to RE the part in question, and provide sample items, historical contract information and technical data to the prospective RE activity. The DMT will request feasibility analysis, technical/cost proposals, and completion schedules, and ensure plans for incorporation of product improvement or redesign initiatives as part of the RE process. The DMT will evaluate RE proposals for feasibility, technical merit and schedule conformance. The DMT will evaluate LOT costs for the RE alternative, including: RE feasibility analyses and studies; source set-up and tooling (as required); prototype production; reprocurement data package development, review and approval; LOT material; and additional life cycle logistics manpower/material costs resulting from redesign or product improvement initiatives.

Substitution -- This option involves analyzing DMSMS item characteristics and attempting to locate a similar part with an acceptable degree of non-conformance. The DMT will conduct a detailed cross-reference and comparison of original versus substitute part characteristics. An engineering deviation or waiver is generally required to support the substitution option since the change may require relaxing part specifications or performance parameters. The DMT will also collect comprehensive part characteristics using manufacturer's documentation and other reference product, identify all critical parameters and operational characteristics necessary to allow comprehensive evaluation of substitute candidates, solicit support from the engineering community to verify conformance to technical requirements, research manufacturer and industry data sources and develop a list of potential substitutes for the DMSMS item, document characteristic data for each substitute candidate and compare them the DMSMS item characteristics, draft a list of items that most closely resemble the DMSMS part, work with the engineering community to conduct an engineering analysis to determine if the substitute part matches required technical and functional requirements and appears to be a reasonable form and fit replacement for the DMSMS item, determine the potential for LOT substitute availability, . refine the substitute candidate list as appropriate, ensure development of associated engineering change, deviation, or waiver packages, estimate costs associated with a LOT procurement of each substitute candidate by projecting timeframes for item review, approval, and availability, including engineering analysis, source qualification requirements (if necessary), price of substitute items, testing, and associated engineering and logistics documentation change.

APPENDIX D
EFV METRICS FOR PRO- ACTIVE DMSMS MANAGEMENT AND EXTERNAL LIAISON

Program Name
ACAT Level
Program Phase
DMSMS Point of Contact (e-mail and phone)

FY 05	Opened (qty)	Resolved (qty)	Closed (qty)
COTS/Modified COTS			
Other			
Total			

	FY05 (& previous)			
Mitigation Resolution	Resolved (qty)	Closed (qty)	Est. Cost to resolve/close ($K)	Est. Cost avoidance ($K)
1. Original component				
-Existing Stock				
-Continue to Mfr				
-Reclamation				
2. Alternate				
3. Substitution				
4. Life of Type Buy				
5. Aftermarket				
6. Emulation				
7. Reverse Engineering				
8. Redesign (minor)				
9. Redesign (major)				
Total				

Has any case data been shared across the DoN in a shared data environment? Observations, Trends, and Comments (for additional space expand text box or attach document)

APPENDIX E
DMSMS RESEARCH SOURCES

These DMSMS research sources are generally established to allow immediate DMSMS application assessments for the specific system/equipment in question. Descriptions of these tools are from the DMSMS COE web page.

Government-Industry Data Exchange Program -- The GIDEP database can be searched by National Stock Number/Part Number to see if there has been a DMSMS alert for an item. The DMT can see previous and current actions used by other activities to resolve DMSMS situations. The GIDEP program also provides for exchange of information relative to part manufacturing, testing, operation, and characteristic data among industry and government agencies, and may also be used as a primary source of information for identifying substitute parts and redesign criteria. Access to information is available through designated GIDEP representatives at subscriber organizations, both public and private, and the DMT will ensure coordination with their GIDEP representative to support DMSMS case investigations.

Defense Supply Center Columbus (DSCC) -- As the Inventory Control Point to all Federal Stock Class 59XX (includes microcircuits and semiconductors), DSCC is a primary DMSMS discontinuance notification source. DSCC queries DoD activities to determine future requirements for each part that the manufacturer indicated is being discontinued. After aggregating total DoD requirements, DSCC determines whether existing stock-on-hand is sufficient or whether they need to acquire the inventory using another option (emulation, extended buy, substitution, etc.).

DMEA -- DMEA is the DoD's Executive Agent for integrated circuit microelectronics DMSMS activities, and the central activity for microelectronics in the Virtual Parts Supply Base. DMEA responds to obsolete parts requests when no solution from any other source is available. DMEA provides engineering solutions (e.g. reverse engineering) to DMSMS problems upon request from various DoD and federal agencies. DMEA develops and maintains an organic expertise in microelectronics technologies to assist requesting organizations in the identification and resolution of DMSMS problems within identified systems. Their capabilities include integrated circuit design & development, system design & development, technology assessment, feasibility & data engineering and component testing.

Commercial On-Line and Compact Disc Reader Only Memory (CD-ROM) --Numerous commercial on-line and CD-ROM products are available which provide descriptive and reference data on items purchased by the U.S. Government. Many of these products use information from government databases; however, they generally provide cross-reference access to multiple files with various menu options to tailor data searches. In addition, commercial products are available which provide detailed engineering and characteristics data for product selection and substitution analysis.

Original Equipment Manufacturer (OEM) -- The prevalence of DMSMS problems has prompted many OEMs to establish in-house DMSMS programs, as well as automated weapon system configuration, DMSMS case history and resolution files. Resulting manufacturer/vendor

databases are generally not available to government agencies except by special request or formal contract negotiation. However, this resource should be utilized to the extent allowed by the contract and the overall level of coordination and data exchange the designated OEMs will allow.

APPENDIX F
EFV DMSMS TOOLS SUITE

DMSMS tools are categorized as logistics tools, predictive tools, or reliability tools. The following tools have been selected for use on the EFV program by the DMT. Descriptions of these tools are from the DMSMS Center of Excellence web page.

Logistics Tools

Logistics tools are generally used to: identify an item-of-supply or part, detail the number of assets on-hand, location of assets, and/or asset quality problems, etc.

Logistics On-Line Access (LOLA) -- LOLA is a graphic user interface that retrieves data from the Federal Logistics Information Service (FLIS) database, the heart of the federal supply system. This system is administered by the DLA Service (DLIS), with the database maintained at the Mega Center at DSCC. LOLA retrieves data that is only four hours old, making it the most current data available compared to other FLIS based tools.

Web Customer Account Tracking System (WebCATS) – WebCATS is a web-based system maintained by the Defense Supply Center at Richmond (DSCR) that retrieves supply data on Defense Logistics Agency (DLA) managed items. This information is retrieved from the DLA Standard Automated Material Management System located at each of the supply centers.

Federal Logistics Information System (FED LOG) – FED LOG is the logistics information system published by the Defense Logistics Information Service. Cataloging information on seven million plus stock numbers and 12 million plus part numbers.

GIDEP Database -- GIDEP has been designated as the centralized database for the timely distribution of DMSMS data, distributed through DMSMS Notices. In addition, GIDEP distributes Product Change Notices and Product Information Notices that are used to inform users of changes in technical characteristics or parameters in items/materials. The intent of these notices is to provide programs with advanced notice of product discontinuance or product changes in order to allow these activities maximum lead time to make decisions among using alternate source, redesigning affected components of a system, or making LOT buys.

GIDEP electronically distributes via the GIDEP database these DMSMS, Product Change, and Product Information Notices, making the manufacturers' information and the government's responses immediately available.

Shared Data Warehouse -- The DMS Shared Data Warehouse being developed will further enable EFV to manage parts obsolescence. The Shared Data Warehouse promotes a systematic, single methodology for processing notices of discontinuance.

HAYSTACK – A parts and logistics management system that provides access to information on over 100 million items in the U. S. Federal Supply Catalog, over 40 U. S. Army, Navy, Air Force related databases and commercial parts.

Predictive Tools

A second category of available tools is the predictive tool. OMIS has been selected as the primary predictive tool for EFV. OMIS will determine the status of the BOM for any obsolescence issue. OMIS will be supplemented with Q-STAR and TACTRAC.

Obsolescence Management Information System (OMIS) -- This system has been developed and is used by NUWC, Keyport. It is a program designed to assist with on-going efforts to sustain specific hulls or aircraft or systems. OMIS monitors configuration by hull or type and provides projections for how long a system remains supportable, what the limiting factor will be, and can update supportability projections when a problem part is resolved or thought to be resolved to help determine the most prudent action to take on a case-by-case basis.

QinetiQ's - Sustainment Technology Assessment Resource (Q-STAR) -- Q-STAR is a web-based tool that EFV to load unlimited BOMs and determine obsolescence vulnerability for components contained in those BOMs. The system provides discontinuance alerts, life cycle projections, life-of-type buy notices, potential substitute part listings and other information and reports critical to managing obsolescence issues. This tool statuses the components based on the status of the "base item", so you must evaluate the offered replacements for acceptability for use in your system. Q-STAR was recently competitively selected as the first predictive tool for use in the DMSMS COE.

TACTRAC -- TACTRAC was the first of the predictive tools on the market, and it is a behind-the-firewall client server software system. You place your BOM in the required format and load it into the tool. It is important that you ensure the OEM part numbers to base part number relationships are correct so that the parts on your list will status. This tool can handle indentured and non-indentured BOMs, and has a web based component look-up feature. Based on the status of the components, you can determine the relative health of your boards, boxes; determine system usage, part counts and other information. This tool provides information on potential substitute parts and availability predictions out to eight-years based on proprietary algorithms. The analysis data is exportable and has automatic alert email notifications.

Reliability Tools

Many reliability tools have been and will continue to be internally developed by government agencies or a contractor, for a specific purpose, but there are also some subscription tools of note in the commercial market place. Once again, these are either subscription based or you purchase the software outright. These tools are important to help determine how long your assets will carry your program based on demand, rates, failure rates and many other factors. They will help develop an OIA.

RELEX -- Relex, an industry leader in reliability and maintainability since 1986, provides a range of software, consulting services, and training. Using universally accepted reliability models, the Relex software allows you to determine mean time between failures, component reliability, and many other statistical analysis variations including Weibull analysis, fault tree analysis, and Markov modeling. Also available is a web-based tool for failure tracking, analysis, and corrective action. The software is available to support all types of users from single PCs to large-scale, integrated enterprise wide deployments and can be applied as desired for the supportability analysis of a component, board, box, or system.

APPENDIX G
CASE RESOLUTION ANALYSIS WORKSHEET

The case resolution analysis worksheet will be used to document the rationale and justifications of DMSMS-related trade-offs and decisions made by the DMT. The PIA intends to maintain these files for a period of seven years, whereas a current artifact listing for the last six months will be available real-time with a six and on-half year history being maintained in archived files.

	Why Resolution Was Not Chosen?			Resolution Chosen and Rationale
	Not Cost Effective	Time Constraints	Other Reason NEFV= Non-economical for vendor, NOS = No Other Sources , NFS = No F3 source, FC = F3 constraints, Other - Please Identify	LCA = Least Cost Alternative, Other – Please Identify
RESOLUTIONS				
Encouraged the existing source to continue production.				
Used the current item specification to find another source.				
Converted the existing item specification to a performance-based specification.				
Obtained an existing substitute item that will perform fully (in terms of form, fit, and function).				
Redefined requirements through applicable engineering support activities, and considered buying from a commercial source.				
Used current manufacturing processes to produce a substitute item (form, fit, and function) for the unobtainable item.				
Made a "Bridge Buy" of a sufficient number of parts to allow enough time to develop another solution.				
Made a LOT Buy.				
Due to using Government-Furnished Equipment (GFE), stopped production, reclaimed the GFE, and reissued it to a new source to help establish production capabilities.				
Reclaimed DMSMS parts from marginal or out-of service equipment or, when economical, from equipment that is in a long supply or potential excess position.				
Reverse engineered the item to develop an exact replica of the item.				
Modified or redesigned the end item to drop the part in question or replace it with another.				
Replaced the system in which the DMSMS item is used.				
Required the using contractor, through contractual agreements, to maintain an inventory of DMSMS items for future DoD production demands.				
Obtained a production warranty from the contractor to supply the item or items for a specified time (life of equipment) irrespective of demands.				