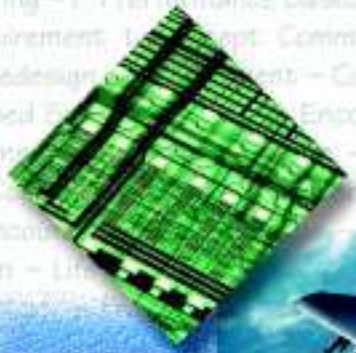
Case Resolution Guide

(version 2.0)

Air Force Materiel Command DMSMS Program

31 March 2001



The DMSMS Program Office gratefully acknowledges
the many organizations that contributed to this first revision of the
AFMC DMSMS Case Resolution Guide.

In the spirit of continual quality improvement, any ideas regarding the improvement of this guide are appreciated.

DMSMS Program Office:

JAMES NEELY
AFRL/MLME

Wright-Patterson AFB OH 45433-7739
Voice: (937) 904-4374 DSN: 674-4374
Fax: (937) 656-4420 DSN: 986-4420
e-mail: James.Neely@wpafb.af.mil

MONICA POELKING
AFRL/MLME

Wright-Patterson AFB OH 45433-7739
Voice: (937) 904-4352 DSN: 674-4352
Fax: (937) 656-4420 DSN: 986-4420
e-mail: Monica.Poelking@wpafb.af.mil

The DMSMS Case Resolution Guide (Version 2.0) was prepared
under contracts F33615-96-D-5119 and F33615-00-D-5543

By

Universal Technology Corporation (UTC)
1270 North Fairfield Road
Dayton, OH 45432-2600
Phone: (937) 426-8530

31 March 2001

EXECUTIVE SUMMARY

In today's high-tech Air Force, the ultimate performance of aircraft, missiles, and numerous other weapon systems depends on a multitude of important and often complex components. When one of these key components, (e.g. a microcircuit) becomes obsolete or unavailable, the impact can extend throughout the weapon system affecting cost and system readiness. This guide is aimed at lessening or eliminating the risks caused by parts non-availability before the weapon system is adversely affected. However, none of the tools described in this guide are effective if the indentured structures of the weapon systems are not known.

The general problem of parts obsolescence or non-availability is referred to as Diminishing Manufacturing Sources and Material Shortages (DMSMS). DoD 4140.1-R defines **DMSMS as the loss, or impending loss, of manufacturers of items or suppliers of items or raw materials. The military loses a manufacturer when that manufacturer discontinues or plans to discontinue production of needed components or raw materials.** Challenges to effective DMSMS Management include (but not limited to):

Supply-Side Challenges:

1) Manufacturers naturally favor supporting customers who comprise large market share. This may manifest itself as little or no notice of product discontinuance for smaller market share customers (e.g., DoD).
2) Manufacturers are often reluctant to reveal exactly when, in the future, they will cease production on a product. Early knowledge of planned product discontinuances would lessen the chance of designing-in obsolete parts.
3) The unpredictable nature of scientific discovery and component development, for example, anticipating creative breakthroughs in cutting-edge fields of technology is a nearly impossible task.

Demand-Side Challenges:

1) DoD electronics market share has decreased from approximately 20 percent to less than one percent.
2) Increased weapon system life cycles (e.g., a 94 year life span is projected for the B-52).
3) The perception exists that transferring responsibility to the contractor automatically reduces program risk. Eliminating Military Specifications and Standards, increased use of performance specifications and the shift of technical responsibility to contractors will not, alone, minimize program risk. Contractual requirements for DMSMS risk management are essential. However, if a program fails because risk isn't managed well by the contractor, the Government Program Manager is ultimately responsible. The Program Office must have the ability to weigh contractor recommendations and approve or disapprove a course of action.
4) Discussions of pro-activity often focus solely on actions that are appropriate during initial system acquisition design phases. However, faced with a significant number of aging systems, proactive DMSMS risk management approaches for legacy systems must be used. The approaches should consider frequent and sometimes extensive modifications, and increasingly, even such options as lifetime parts buys must be considered, yet tempered by the burden of inventory storage costs. DMSMS must be considered in all phases of a system's life cycle.

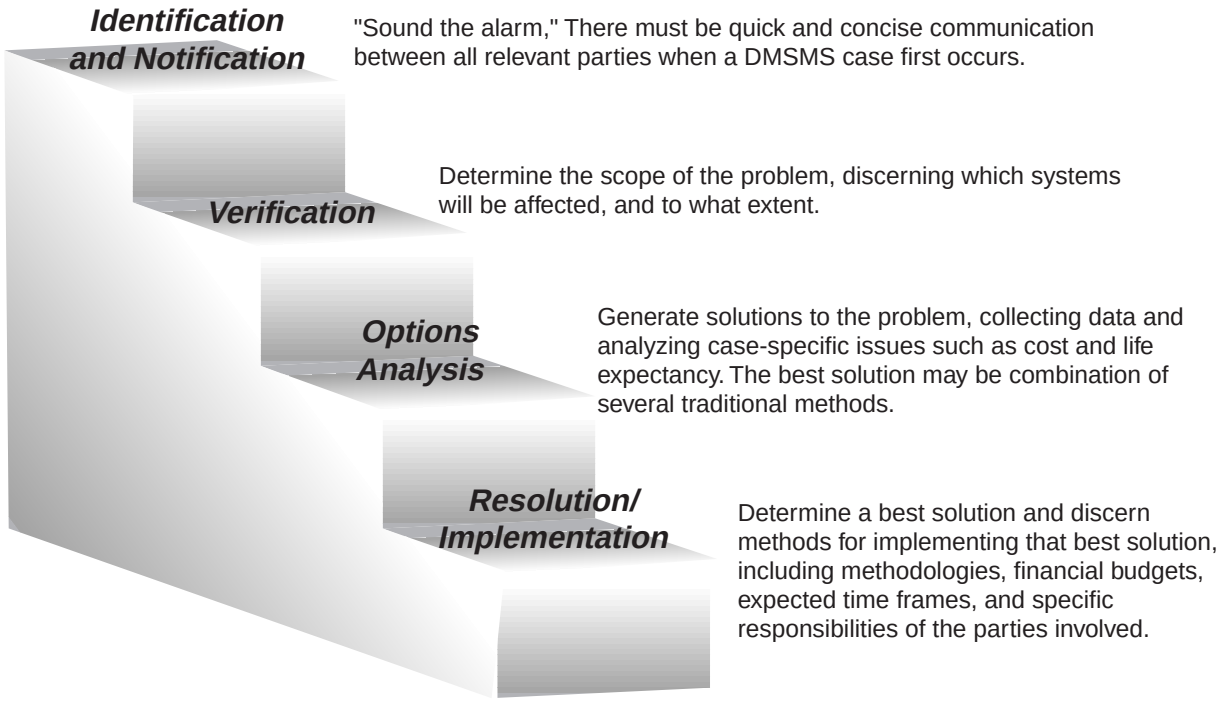
Program Risk. This guide concentrates on an **active risk management** plan of attack, from initial discovery of a DMSMS problem to implementation of a final solution. Initially, this guide will focus on the active risk management process that takes place upon being notified of a discontinuance in an effort to preclude actual impact to the weapon system (low involvement, yet Proactive). It will then discuss higher involvement levels for controlling risk. This approach is in keeping with current proactive models of "active risk management" and recognizes that risk management can best be described as a continuum (note the table below).

DMSMS Risk Management

Reactive Reacting to consequences of risk.	**Proactive** The DMSMS team has a visible process of identifying, analyzing, and controlling risks that are measurable and repeatable.		
No Involvement	Low Involvement	Moderate Involvement	High Involvement

Certainly, an ideal approach to such a pervasive problem would seem to hinge on being proactive, in essence solving obsolescence problems before they have a severe impact. AFMC concentrates on this type of active risk management... taking action before it is too late. Based on resources, or sphere of responsibility, this approach may be limited or more robust. Nonetheless, the seriousness of the DMSMS problem demands a proactive approach. The AFMC DMSMS Program Office Hub provides important yet limited proactive process involvement while fostering a decentralized AFMC DMSMS Program. Typically, higher levels of DMSMS involvement depend on the resources of the System Program Offices (SPO).

Notwithstanding numerous challenges to active DMSMS risk management, AFMC organizations attack DMSMS issues using a straightforward problem solving process. The **active DMSMS risk management process** can be illustrated with a simple schematic.



This guide is aimed at lessening or eliminating the risks caused by parts non-availability before the weapon system is adversely affected. Initially, this guide focuses (in sections 2 - 6) on the active risk management process (above figure) that takes place upon being notified of a discontinuance in an effort to preclude actual impact to the weapon system (low involvement, yet proactive). Section 7 addresses, “Planning for Obsolescence” (higher proactive involvement levels for controlling risk).

DMSMS is a serious problem, and an unavoidable one. But it is also one that can be effectively managed, if we utilize clear communications and a clearly defined, systematic plan of attack. The purpose of this document is to provide clear, effective, proven approaches to identify and lessen DMSMS risk.

The AFMC DMSMS Program Office Hub is confident the Guide can serve to...
“*protect weapon system supportability while reducing total ownership cost*.”

Visit the AFMC DMSMS Web site for more helpful DMSMS information. http://www.ml.afrl.mil/ib/dpdsp/dmsms.htm

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

LIST OF ACRONYMS

AAN	Agency Action Notice
AFMC	Air Force Materiel Command
AFSAC	Air Force Security Assistance Center
AMARC	Aerospace Maintenance and Regeneration Center
ANNUAL RQ	Annual Requirement
API	Applications, Programs, Indentures
APL	Allowance Parts List
AVCOM	Avionics Component Obsolescence Management
BER	Beyond Economical Repair
CAGE	Commercial and Government Entity (Code)
CD-ROM	Compact Disk - Read Only Memory
CHAIN	Consolidated History of Alternate Identification Numbers
CID	Commercial Item Description
CLS	Contractor Logistics Support
CTIC	Contractor Technical Information Coding
DBMS	Database Management System
DESC	Defense Electronics Supply Center (Now DSCC)
DFAR	Defense Federal Acquisition Regulation
DLA	Defense Logistics Agency
DLSC	Defense Logistics Services Center
DMEA	Defense Microelectronics Activity
DMSMS	Diminishing Manufacturing Sources and Material Shortages
DNABBS	Discontinuance Notice Alert Bulletin Board System
DoD	Department of Defense
DPAS	Defense Priorities and Allocations System
DSCC	Defense Supply Center Columbus (Formerly DESC)
ECP	Engineering Change Proposal
ES	Equipment Specialist
ESA	Engineering Support Activity
F^3I	Form, Fit and Function Interface
FAR	Federal Acquisition Regulation
FASA	Federal Acquisition Streamlining Act
FED LOG	Federal Logistics
FILDR	Federal Item Logistics Data Record
FLIS	Federal Logistics Information System
FMS	Foreign Military Sales

LIST OF ACRONYMS (Cont'd)

FSC	Federal Supply Class
FUT YRS	Future Years
GIDEP	Government-Industry Data Exchange Program
i2	i2 (previously TACTech)
I&SSS	Interchangeability and Substitution Suspense System
ICI	Integrated Circuit Industry
ICP	Inventory Control Point
IL	Identification List
IM	Item Manager/Inventory Management
IPB	Illustrated Parts Breakdown
LOG	Logistics Operations Group
LOT	Life-of-Type
LOT BUY DOLS	LOT Buy Dollars
LOT BUY QTY	LOT Buy Quantity
LRU	Line Replaceable Unit
MAJCOM	Major Command
MCRD	Master Cross Reference Data
MDC	Manager Designator Code
MIIDB	Master Item Identification Database System
MIS	Management Information System
MLAF	Management List, Air Force
ML-C	Management Data List-Consolidated
MP	Military Parts
MPCAG	Military Parts Control Advisory Group
MPN/CAGE	Manufacturer Part Number/CAGE
MRIL	Master Repairable Items List
MTPD	Manufacturing Technology Directorate
NHA	Next Higher Assembly
NSN	National Stock Number
OEM	Original Equipment Manufacturer
OPP	Out of Production Parts
OPR	Office of Primary Responsibility
OSD	Office of the Secretary of Defense
PICA	Primary Inventory Control Activities
POC	Point of Contact
PPSL	Program Parts Selection List

LIST OF ACRONYMS (Cont'd)

QML	Qualified Manufacturing List
QPA	Quantity per Assembly
QPL	Qualified Product List
RDB	Requirements Database
RPL%	Replacement Percentage
SECA	Secondary Inventory Control Activities
SPO	System(s) Program Office
SSSCD	Special Support Stock Control and Distribution System

DEFINITIONS

Aftermarket Manufacturer/Supplier. A manufacturer that buys obsolete production lines to maintain item production, or a supplier that buys quantities of parts going obsolete and stores them for future resale.

Bridge Buy. A limited parts purchase to satisfy near-term requirements until detailed analysis and a longer-term solution can be achieved.

Continue Existing Source. Convince the manufacturer to continue making the item.

Diminishing Manufacturing Sources and Material Shortages (DMSMS). The loss or impending loss of manufacturers of items or raw material. DMSMS is caused when manufacturers of items or raw material suppliers discontinue production.

DMSMS Focal Point. The individual or organization responsible for taking timely actions and for coordinating with other organizations, as appropriate, to ensure the continued availability of DMSMS end items, parts, and essential materiel needed to support current and planned defense acquisition, including the determination of future items requirements.

Documentation Revision. Changes to all documentation pertaining to the affected equipment, including technical manuals, drawings, parts lists, schematics, test procedures, training manuals, and other support documentation.

Emulation. The process of developing form, fit and function replacements for obsolete microcircuits using VHDL or other state of the art materiel design and processing techniques.

Engineering Support Activity (ESA). The Military Service organization designated as responsible for engineering support and technical decisions for a given part or component in that Service.

Engineering Support Focal Point. Entry and exit point for DLA form 339 (Request for Engineering Support) activity within each ESA. The focal point interfaces directly with DLA and ensures a 339 request is assigned to the appropriate engineer or forwarded to the correct and proper ESA if necessary. Focal point also provides records and tracks associated timeliness and quality metric data.

Equipment Specialist. The individual or position responsible for assisting the acquisition team during the development/production phase and for technical management of a system, subsystem or commodity during the sustainment phase of a program.

Excess Assets Source (Contractor Assets). A firm or activity that owns obsolete, surplus items owned by a firm or activity that is not an Aftermarket Manufacturer or Aftermarket Supplier.

General Emulation Microcircuit (GEM). A Government (DLA) initiated and contractor supported program that defines, develops, and demonstrates a generic emulation system that makes use of modern technologies followed by specific designs and fabrication and test of microcircuits that are form, fit, and function equivalent to devices originally produced by obsolete technologies.

Inventory Control Point (ICP). The individual or organization responsible for the materiel management of a group of items either for a particular DoD component or for DoD as a whole.

Item Manager (IM). An individual within an organization assigned management responsibility for one or more specific items of hardware.

Life of Type (LOT) Buy (Lifetime Buy, Last Time Buy, Extended Buy). The purchase of enough of an obsolete item to meet the projected demands of the supported equipment for the rest of its operational lifetime. AFMC Instruction 23-103 further defines the term as, a one time procurement, when all cost-effective and prudent alternatives have been exhausted, for the total future requirements of an item no longer to be produced. The procurement quantity shall be based upon demand or engineering estimates of mortality sufficient to support the applicable equipment until phased out.

Manager Designator Code. A code assigned by an Air Force management activity to identify the individual having item management responsibility for specific items of supply.

Market Research. A process used to collect, organize, maintain, analyze and present data for the purpose of maximizing the capabilities, technology and competitive forces of the marketplace to meet an organization's needs for supplies and services.

Non-Recurring Engineering. One time, up-front effort associated with research, development and design. Includes prototype manufacture, prototype testing, labor, and overhead.

Open Systems Architecture. A business and engineering strategy that seeks to develop Systems Architectures that employ the use of open systems interface standards to the maximum extent practical. An open systems interface standard is a publicly available document defining specifications for interfaces, services, protocols, or data formats established by consensus and is widely used in the market. A more detailed description is provided in section 7.

Part Testing (Form, Fit, Function). The testing necessary to ensure an item meets required parameters.

Part(s) Removal. In this context, refers to having a person physically remove an item from decommissioned equipment.

Qualification. Verifying if a manufacturer or an item meets manufacturing or item specifications Qualified Manufacturing List (QML) or Qualified Product List (QPL).

Reclamation (Decom, Cannibalization). The use of items found in equipment beyond economical repair, at repair facilities, within deactivated or decommissioned units, or removed and stored due to modernization programs.

Redesign. Designing a new item to replace an item that is obsolete or contains obsolete components.

Requirements (Future Requirements). The number of parts needed for the remaining, projected lifetime of the equipment being supported.

Reverse Engineering. The process of developing an exact replica of an item by using technical data, disassembled and analyzed copies of the original part and test data.

Substitution. The use of a similar item with an acceptable number of design differences that will not degrade the performance of the equipment.

VHDL (VHSIC Hardware Description Language). A standard worldwide language for the design and description of electronic systems. VHDL captures the functionality of a component, Shop Replaceable Unit (SRU), Line Replaceable Unit (LRU) or higher assembly, and allows for technology to change while minimizing functionality change. According to IEEE Language Reference Manual, "because it is both machine readable and human readable, it supports the development, verification, synthesis, and testing of hardware designs; the communication of hardware design data; and the maintenance, modification, and procurement of hardware".

See Appendix C for "Definition of Roles".

DIMINISHING MANUFACTURING SOURCES AND MATERIAL SHORTAGES (DMSMS)

Case Resolution Guide (version 2.0)

1. INTRODUCTION

1.1 DMSMS - What is it?

The general problem of parts obsolescence or non-availability is referred to as Diminishing Manufacturing Sources and Material Shortages (DMSMS). DoD 4140.1-R defines **DMSMS as the loss, or impending loss, of manufacturers of items or suppliers of items or raw materials. The military loses a manufacturer when that manufacturer discontinues or plans to discontinue production of needed components or raw materials.**

The *majority of DMSMS problems occur in the area of electronic components*, primarily federal stock class (FSC) 5961: semiconductors and FSC 5962: microcircuits; however, DMSMS affects all weapon systems and materiel categories. DMSMS problems impact more than piece-parts/ consumables. DMSMS can and will include obsolescence at the part, module, component, equipment, or other system indenture level.

DMSMS can occur in any phase of a program's life cycle, from early design phases through post-production support, and has the potential to severely impact the program/end item in terms of schedule and life cycle cost. Prior to the time the Systems Program Office (SPO) transitions parts management responsibility to the logistics community, the SPO and the prime contractor are responsible for resolving DMSMS issues. Parts management responsibility for the vast majority of consumable parts resides with a Defense Logistics Agency (DLA) Supply Center. For example, Defense Supply Center, Columbus (DSCC) manages FSCs 5961 and 5962 (mentioned above). However, a small percentage of service-unique consumable parts continue to be managed by the military branch (e.g., Air Force). Integral to parts management is paying for parts. Current DoD **buy policy** assigns parts funding responsibility as shown in Figure 1a.

Type of Part(s)	Agency Responsible for Funding Part(s)
Parts for new production of weapon systems	Program Manager
Next higher assemblies (NHA)	Program Manager
Spare and Repair Parts	DLA purchases "up-front" and sells to DoD activities (e.g., NHA managers)
Foreign Military Sales (FMS)	Country

Figure 1a. Parts Funding Responsibilities

It should be noted that new DoD acquisition approaches increasingly levy more parts management responsibility on system contractors. Based on this responsibility transfer, it is often important for the SPO management team to acquire, validate, or concur with detailed contractor information on the handling of DMSMS problems. In some instances the logistics function has been integrated with the SPO and a close working relationship is maintained throughout the life of the system.

Challenges to effective DMSMS Management include:

Supply-Side Challenges:

1) Manufacturers naturally favor supporting customers who comprise large market share.

2) Manufacturers are often reluctant to reveal exactly when, in the future, they will cease production on a product. This may manifest itself as little or no notice of product discontinuance. Early knowledge of planned product discontinuances would lessen the chance of designing-in obsolete parts and for existing systems, could help ensure inventory for future requirements.

3) The unpredictable nature of scientific discovery and component development, for example, anticipating creative breakthroughs in cutting-edge fields of technology is a nearly impossible task.

4) Commercial technology drives the market and can experience technology obsolescence every eighteen months.

Demand-Side Challenges:

1) DoD's electronics market share has decreased from approximately 20 percent to less than one percent.

2) Increased weapon system life cycles (e.g., a 94 year life span is projected for the B-52).

3) Lack of dedicated DMSMS funding to resolve obsolescence issues

4) When a manufacturer's discontinuance notice is received, time to respond with future requirements or purchase orders is often short. Since there is no requirement for suppliers to advise DoD of their intent to discontinue a specific part, a DoD activity may not get advance notice.

5) The perception that transferring responsibility to the contractor automatically reduces program risk. Eliminating Military Specifications and Standards, increased use of performance specifications and the shift of technical responsibility to contractors will not, alone, minimize program risk. Contractual requirements for DMSMS risk management are essential, however, if a program fails because risk isn't managed well by the contractor, the Program Manager is ultimately responsible. The Program Office must have the ability to weigh contractor recommendations and approve a course of action.

6) Discussions of pro-activity often focus solely on actions that are appropriate during initial system design phases. However, faced with a significant number of aging systems, proactive DMSMS risk management approaches for legacy systems must be used. The approaches should consider frequent and sometimes extensive modifications, and increasingly, even such options as lifetime parts buys must be considered, yet tempered by the burden of inventory storage costs. DMSMS must be considered in all phases of a system's life cycle.

7) DMSMS problems being assessed by a given SPO may be common to other SPOs. Often, however DMSMS issues are handled individually, SPO by SPO with potentially less than effective cost solutions that might otherwise be derived from horizontal coordination between SPOs.

8) An additional complication has been the relative infrequency with which some participants handle DMSMS issues, often as an additional duty. Even for those who have some experience or who have been previously trained, with no reference guide available, it becomes easy to overlook important considerations or steps.

9) DMSMS safeguards may run counter to current acquisition reform initiatives (e.g., just in time inventory).

1.2 Scope of this Document

This *DMSMS Case Resolution Guide* provides an approach to assist in analyzing and resolving DMSMS situations throughout weapon system acquisition and life cycle support. Additionally, it encourages tracking and documenting DMSMS cases and resolutions supporting Office of the Secretary of Defense (OSD) requirements. These metrics are intended to be used to establish the need for dedicated funding for DMSMS. It also provides a baseline for performance of cost-benefit analyses supporting DMSMS situations.

Risk. This guide concentrates on an **active risk management** plan of attack, from initial discovery of a DMSMS problem to implementation of a final solution. Initially, this guide will focus on the active risk management process that takes place upon being notified of a discontinuance in an effort to preclude actual impact to the weapon system (low involvement, yet Proactive). It will then discuss higher involvement levels for controlling risk. This approach is in keeping with current proactive models of "active risk management" and recognizes that risk management can best be described as a continuum (see Figure 1b).

Reactive Reacting to consequences of risk.		**Proactive** The DMSMS team has a visible process of identifying, analyzing, and controlling risks that are measurable and repeatable.	
No Involvement	Low Involvement	Moderate Involvement	High Involvement
Doing nothing until the system functionality is impacted by a part that is no longer available	Focusing on the risk management process that accepts risk until being notified of a discontinuance, after-which, a contingency plan is developed and employed to preclude impact to the weapon system mission capability	Mitigating risks by actively taking steps on parts that appear to offer more risk exposure (combination of high probability and significant impact). Examples of this approach include use of hierarchical/ indentured databases describing the weapon system	Agency takes steps to avoid the risk (e.g., Use of Open Systems Architecture, Scheduled Technology Replacement, and VHDL)

Figure 1b. DMSMS Risk Management

Certainly, an ideal approach to such a pervasive problem would seem to hinge on being proactive, in essence solving obsolescence problems before they have a severe impact. AFMC concentrates on this type of active risk management...taking action before it is too late. Based on resources, or sphere of responsibility, this approach may be limited or more robust. Nonetheless, the seriousness of the DMSMS problem demands a proactive approach. The AFMC DMSMS Program Office Hub provides important yet limited proactive process involvement while fostering a decentralized AFMC DMSMS Program. Typically, higher levels of DMSMS involvement depend on the resources of the System Program Offices (SPO). Notwithstanding numerous challenges to active DMSMS risk management, AFMC organizations attack DMSMS issues using a straightforward problem solving process. The active risk management **DMSMS Resolution Process** is described in Section 1.3.

1.3 The DMSMS Resolution Process: An Overview

This overview summarizes the key steps of resolving a Diminishing Manufacturing Sources and Material Shortages (DMSMS) case. Sections 2 through 5 of the *Case Resolution Guide* provide an in-depth look at each of these steps. Section 6 summarizes the process and transitions to Section 7 on increasing our level of proactive DMSMS management. Additionally, the appendices provide detailed tools, resource and reference lists, worksheets and sample calculation formats to assist in performing the various steps and to assist in accurate evaluation of the various resolution options available for each DMSMS case. Representatives from all phases of the DMSMS process including Defense Logistics Agency / DSCC; AFMC Inventory Management; the 88th Operations Support Squadron; Headquarters and SPO Engineering; and the Applications, Programs, Indentures (API) data system, were consulted in the development of this guide.

1.3.1 How is a DMSMS Problem Resolved?

The DMSMS process itself consists of a few straightforward steps (**Figure 1c**).

Figure 1c. The DMSMS Resolution Process

1.3.2 DMSMS Resolution Steps

- **Problem Identification & Notification** - A DMSMS occurrence is identified and notification of a potential problem is disseminated. The sources of alert notices are detailed in **Section 2**.
- **Verification** – Determining the extent of the problem, where affected item(s) are used, the usage rate and the total future expected requirements, is explained in **Section 3**.
- **Options Analysis -** Case data is collected, organized and analyzed to determine the best course of action. Case specific issues and constraints such as funding available, time until part is no longer needed, etc. are weighted and used to judge the alternatives available for resolution. Several common alternatives exist to resolve DMSMS problems. Appendix A describes details of the most common program resolution alternatives. They may be used alone or in combination to resolve a particular case. Each alternative has advantages and disadvantages to be considered in determining the most cost effective approach. See **Section 4 and Appendix A.**.
- **Resolution & Implementation** - Once a course of action is selected, implementation of the most cost effective resolution alternative is the final step. Considerations for selection / implementation are explained in **Section 5**.

1.4 Documentation

After encountering problems on a program, the lessons learned should be documented to include any warning signs that, with hindsight, preceded the problem, what approach was taken, and what the outcome was. This will not only help future acquisitions, but could help identify recurring problems in existing programs. Currently in development, the Shared Data Warehouse at GIDEP is expected to eventually host this type information.

1.5 DMSMS Policy

Appendix F supplements the following DMSMS policy and procedures information.

1.5.1 The Implementing Regulation

The obsolescence of parts used in weapon systems has grown to proportions that justify its recognition as a major DoD initiative. The primary regulation governing the administration of initiatives to resolve obsolescence problems is DoD 4140.1-R, Materiel Management Regulation, May 1998. This regulation contains policy, procedures and definitions. It also assigns roles, sets general goals and suggests approaches to resolve DMSMS cases. The Regulation recognizes that obsolescence is a problem that needs to be addressed during system design and suggests proactive activities to minimize effects throughout the system's life cycle.

1.5.2 AFMC DMSMS Instruction

AFMC Instruction 23-103, Diminishing Manufacturing Sources and Materiel Shortages (DMSMS) Program, 13 October 2000 implements Air Force Policy Directive (AFPD) 23-1, Requirements and Stockage of Materiel, and the policy provided in DoD 4140.1-R. It is to be used by AFMC and its contractors and applies to Foreign Military Sales (FMS) customers for weapon systems no longer in AFMC inventory. The AFMC DMSMS Program Office web site provides a link to DMSMS policy documents.

1.5.3 Special Priorities Assistance

If the imminent departure of a sole-source supplier becomes urgent, the Defense Priorities and Allocations System (DPAS) may provide assistance. Appendix B provides an overview of DPAS.

1.5.4 The OSS&E Program

Air Force Instruction 63-1201, 29 March 1999, Assurance of Operational Safety, Suitability, & Effectiveness (OSS&E) implements AFPD 63-12, Assurance of Operational Safety, Suitability, & Effectiveness. It defines a process for establishing and preserving the safety, suitability, and effectiveness of Air Force systems and end-items over their entire operational life. The OSS&E program places strong emphasis on risk management and configuration management and therefore attaches significance to DMSMS problems that can effect both areas. This policy requires any selected DMSMS resolution alternative, other than identical items from an approved source be approved by the chief / lead engineer.

1.5.5 Federal and Defense Acquisition Policy

The "Federal Acquisition Regulation" (FAR) and the "Defense Federal Acquisition Regulation Supplement" (DFARS) are central to defense contracting. Appendix F provides examples of existing contractual provisions relevant to DMSMS.

1.6 AFMC's DMSMS Program

The elements of the DMSMS program are evolving. Processes are being developed and refined and data sources are constantly being improved. Interfaces between tracking databases are being developed and solutions to obsolescence problems are being found that may impact related problems.

AFMC established the DMSMS Program Office / Hub to provide service to organizations that are experiencing obsolescence problems. The operating philosophy of the Program Office is to empower AFMC programs to resolve their unique DMSMS challenges by providing them with supportive information, tools and training.

Obsolescence cases come in a variety of forms and the organizations that must resolve those cases can be very different in capability and interest. Resolving DMSMS cases can make use of a variety of problem solving approaches.

One goal of the Hub is to foster involvement of all parties that can contribute to the resolution of a particular obsolescence case. This typically includes ALCs, SPOs, contractors and suppliers as

well as organizations that have relevant information in parts, indenture or lessons-learned databases.

The Hub provides a full, yet bounded spectrum of DMSMS services to include:

INFORMATION	TOOLS	TRAINING
Policy and Guidance - Providing DMSMS contract clauses - Recommending Policy	***Develop and Test*** - Shared Data Warehouse - Participate with the Government - Industry Data Exchange Program (GIDEP)	***Design and Develop DMSMS Training*** - Determine training requirements - Update DMSMS Case Resolution Guide
Coordination - Participating on OSD DMSMS Working Group - Providing input to annual report to Congress - Participating in technical meetings	***Operate and Maintain*** - Data queries - Composite DMSMS database	***Deliver*** - Provide training on DMSMS vendor tools - Provide technology familiarity training (e.g., VHDL)
Analysis - Managing AFMC's DMSMS discontinuance process - Providing system support and analysis	***Improvement*** - Foster SPO porting of data to the API system - Critique vendor tools	
Awareness - Clearinghouse for DMSMS questions - Authoring the DMSMS web site - Technology updates	***Demonstrations*** - Plan and host Multi-vendor demonstrations - Help organizations acquire DMSMS products and services - Leverage Program Support	

Figure 1d. AFMC DMSMS Hub Services

When a manufacturer submits a notice that parts are being discontinued, a determination of the future requirements for those parts must be made. The Hub has had a key role in streamlining and expediting this determination. Detailed information on this process is provided in Section 3.

In addition to the organizations that contribute directly to the solution of obsolescence cases, there are a number of entities that have important roles in related areas. The Hub maintains interfaces with such relevant entities as the AF Manufacturing Technology Program office, relevant inventory control points, and engineering support activities. Other important interfaces are shown on Figure 1e and described below in Section 1.6.1 and in Appendix C.

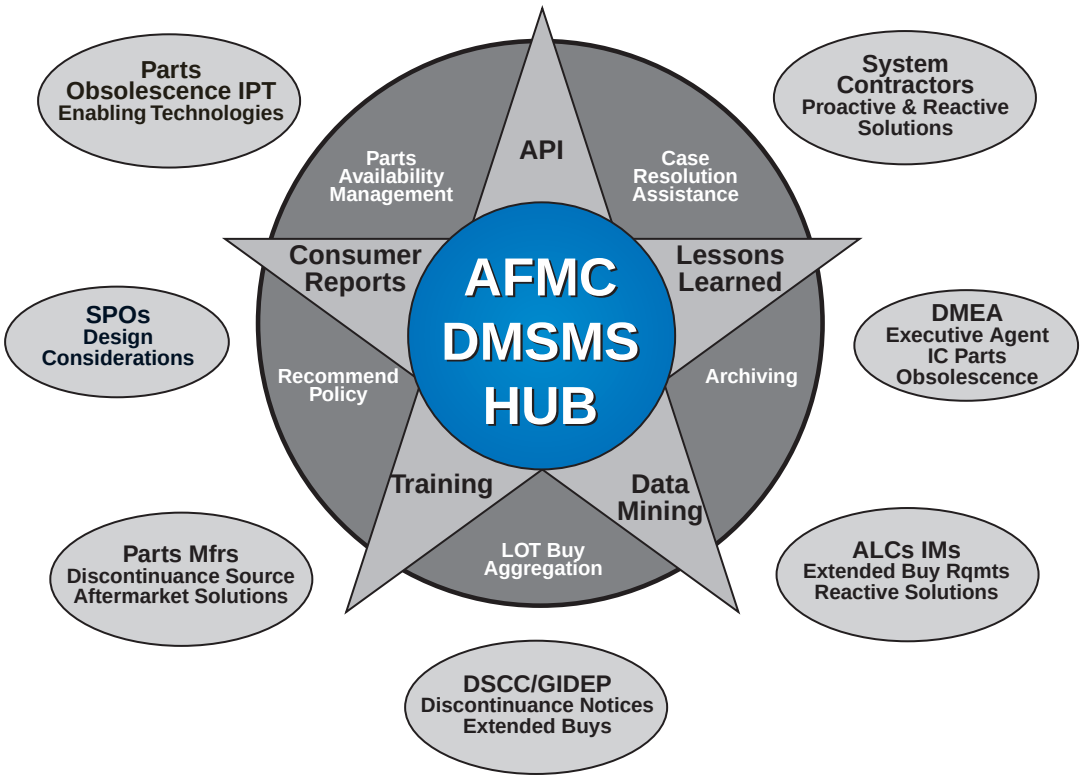


Figure 1e. AFMC DMSMS Hub Services and Interfaces

1.6.1 Who are the Players?

The AF DMSMS Program is structured to involve the DMSMS Command OPR, the AFMC DMSMS Program Office, the DLA/DSCC, the Air Logistics Centers (ALC), the System Program Office (SPO), Item Managers (IMs), Equipment Specialists (ESs), Stock Control Clerks, Engineering Support Activities (ESAs), the Government-Industry Data Exchange Program (GIDEP), and defense contractors with decision-making authority retained by the office of primary authority as designated by regulation.

- The **DMSMS Command OPR** (HQ AFMC/ENPM) is the Office of Primary Responsibility (OPR) for the DMSMS program. As the command OPR, HQ AFMC/ENPM is responsible for policies, procedures, and, as required, the coordination of efforts with other DoD activities, federal agencies, and industry.
- The **AFMC DMSMS Program Office Hub** (AFRL/MLME) is responsible for ensuring this Department of Defense (DoD) program is executed effectively across the Command. The Hub works closely with both DSCC and AF IMs. The Hub makes policy recommendations, performs cross-system analyses, and provides many other tools and services.
- The **Systems Engineering** responsibility is a key component in the resolution of DMSMS issues. The System Engineering Community is uniquely positioned to know future requirements that have not yet been shared with the logistics community. The System Engineering Community has the engineering expertise that can focus on the compatibility between a replacement part or next higher assembly and the remainder of the system. The System Engineering Community plans and implements changes to the system that could truncate the future requirement for a given part and may be required to fund the implementation of a selected resolution. Systems engineering is defined as:

"The management function which controls the total system development effort for the purpose of achieving an optimum balance of all system elements. It is a process which transforms an operational need into a description of system parameters and integrates those parameters to optimize the overall system effectiveness."

- The **SPO** is a principal player in the DMSMS program. The SPO may or may not have its own dedicated systems engineering function. However, like the systems engineering community, SPOs plan and implement changes to the system that could truncate the future requirements for a given part and may be required to fund the implementation of a selected solution.
- The **Manufacturing Technology Division**, Materials Directorate, Air Force Research Laboratory (AFRL) has an Electronics Parts Obsolescence Initiative (EPOI) to develop parts obsolescence management tools. The pending move to a Contractor Logistic Support (CLS) environment changes issues that must be faced in dealing with Out of Production Parts (OPP). A Pre-Planned Periodic Product Improvement strategy (P4I) has been proposed that would avert the OPP problem through planned periodic reengineering over the life cycle of the product. This strategy calls for the design of products from the beginning with the expectation that they will be reengineered several times over their life cycle. This is a significant departure from the design philosophy that has been prevalent for many years that emphasizes performance and low weight and volume.
- The **Engineering Support Activity (ESA)** is the military service organization designated as responsible for engineering support and technical decisions for a given part or component in that Service. In the case of multiple recorded users in a service, there may be more than one ESA. Over the past several years, the military services have participated with the Defense Supply Center, Columbus (DSCC, formerly "DESC") in the "Consumable Item Transfer" (CIT). This effort essentially transferred the responsibility for managing Air Force (and the other military services) consumable parts from the Air Force to DLA (DSCC). One of the AFMC ESA activities is the 88 OSS/OSE (formerly the 88th LOG) at Wright-Patterson AFB, Ohio.
  - The 88th has ESA responsibility for common-use (Army, Navy, Air Force) consumable parts that fall in the federal stock class (FSC) 59XX (electronics) that were managed by DLA prior to the CIT.
  - The 88th also is responsible for FSC 59XX parts that were a part of the CIT and were managed by Sacramento ALC unless the part has a Material Management Aggregation Code (MMAC); in which case Oklahoma City is the ESA.
  - If the item was a part of the CIT and previously managed by an Air Logistics Center (ALC), the ALC with the Losing Item Manager (LIM) is the ESA.

DLA supply centers use a funded DLA Form 339 (Request for Engineering Assistance, Appendix G) to ask for assistance from an ESA. The 88th and the ALC's have the ability to determine the appropriate ESA for a part and are willing to refer those requiring ESA assistance to the appropriate ESA focal point. The 88th OSS/OSE Engineering Focal Point is Mr. Richard Yannitti and can be reached at (937) 656-2576 (DSN: 986-2576) or via e-mail at: richard.yannitti@wpafb.af.mil

- The **Defense Microelectronics Activity (DMEA)** is the executive agent for DoD integrated circuit activities. Also refer to Appendices C and D for more on DMEA.
- **DOD DMSMS Working Group.** DMEA is the chair of the DOD DMSMS Working Group. The Working Group addresses DMSMS problems from a full DOD perspective with core members from the Army, Navy, Air Force, OSD, DLA, and GIDEP. The Working Group meets quarterly to review action items, discuss recent concerns, and develop plans for mitigating the effects of DMSMS upon DOD weapon systems.

- The **DoD Teaming Group** attempts to focus on discontinued electronic components that are common to multiple weapon systems or subsystems. Additional information on this group is provided in Section 4.1.

- **Government-Industry Data Exchange Program (GIDEP).** GIDEP is chartered by the Joint Logistics Commanders, administered by the Navy and funded by all military components. GIDEP is a cooperative activity between government and industry seeking to eliminate the expenditure of resources by making maximum use of existing information. GIDEP provides a medium to exchange technical information essential during all phases of weapon system acquisition and deployment. Participants in GIDEP are provided access to six major categories of data. One of those six data categories is, "Product Information Data" to include DMSMS notices of discontinuance from suppliers. GIDEP's web site address is provided in Appendix E. AFM 23-3, Chapter 26, describes GIDEP and assigns programresponsibilities. Additionally, AFMCI 23-103, describes policy regarding the use of GIDEP in supporting the DMSMS Program. Additional information on GIDEP's role in the "identification and notification" phase of the DMSMS resolution process is provided in Section 2.

- **IMs and ESs.** The DMSMS-related responsibilities of Item Managers and Equipment Specialists permeate DMSMS processes throughout this guide. For example, they play a very important role in coordinating and determining future requirements for discontinued parts. The role of the item manager and the equipment specialist is described in Appendix C, Definition of Roles. Additionally, refer to process descriptions, especially in Section 3 for clarification of their roles.

2. DMSMS PROBLEM IDENTIFICATION & NOTIFICATION

The DMSMS case starts with the manufacturer's decision to cease production of an item. The manufacturer or a vendor may announce the discontinuance or a discontinued item may be first identified when the AF unsuccessfully attempts to procure a part. Identification of an item being discontinued is frequently disseminated in the form of an Alert.

Dissemination of manufacturer discontinuance alerts to the affected DoD organizations is critical to ensure Air Force future parts requirements are met. Often (not always) parts manufacturers, system OEMs, parts distributors and others report discontinuances to GIDEP and their primary DoD customers. These primary customers are known as Inventory Control Points (ICP) and are the managing activity for buying and storing the specific part and for making this alert to other DoD users. DSCC is the ICP for the bulk of DoD electronic consumable parts common to multiple DoD services, and therefore has historically issued the most discontinuance alerts to the military services. Periodically, an ALC, SPO or other entity becomes aware of a part that is about to be discontinued. In this case, it becomes necessary to determine which organization has part management authority to ensure they alert DoD users. This information is frequently known by the person receiving the notification or can be determined through the use of tools such as D043 or Federal Logistics Information System (FLIS). The AFMC DMSMS Hub can assist if needed.

Regardless of who manages the part (DLA/ DSCC or the service (e.g., Air Force)), an Item Manager is assigned responsibility for each part. This person is responsible for coordinating many of the DMSMS resolution process steps leading to a resolution of the discontinuance problem. It is also important to understand that while DSCC may manage a consumable part, that part is used on next higher assemblies (NHA). The NHAs are typically used by multiple DoD services, usually at logistics centers (e.g., ALCs). These NHAs also have assigned responsible item managers who play a major role in helping DLA determine future requirements. Increasingly, the AFMC Systems Engineering Community maintains databases to track the status of parts specific to their system. These databases are kept current by constant interaction with parts suppliers and this interaction sometimes provides the earliest indication of part obsolescence.

For DSCC managed parts, DSCC assigns discontinuance case numbers, performs preparatory reviews, identifies national stock numbers (NSN) and then issues an alert to the military components who determine future requirements and provide that information to DSCC. DSCC works closely with the AFMC DMSMS Program Office / Hub to collect and aggregate future requirements from the impacted Item Managers and Equipment Specialists. The DMSMS Program Office / Hub uses the API data system to identify the next higher assemblies that use parts being discontinued, compile component worksheet(s) that are sent to the item manager(s) for the next higher assembly to determine future requirements. The API autofills some fields on the worksheet while the remainder are to be filled in by the recipient Item Manager and Equipment Specialist before returning the worksheet to the Hub for tabulation and submission to DSCC.

DSCC aggregates the future requirements, reviews submitted information and compares the submitted future requirements with on-hand stock and historical data. DSCC determines the appropriate strategy (making a bridge/LOT Buy, identifying substitute parts, requesting Engineering Support Activity (ESA) Support, etc.) as needed. The resolution alternatives are discussed in detail in the body of this report. DSCC procures, stores and issues components.

For Air Force managed parts in fielded systems, there are two principal ways AFMC organizations become aware of discontinuances

1) Often stock control personnel become aware of a part becoming a "DMSMS item" when they attempt to purchase the item and it is no longer available. It is at these times that a review of historical demand and initial consideration of a needed fix occurs. If no immediate fix is determined, stock control notifies the item manager who begins coordinating a resolution.
2) GIDEP often notifies the AFMC DMSMS Program Office / Hub of discontinued parts that are managed by the Air Force. Upon receipt of the notice, the Hub notifies the applicable ALC/inventory control point of the discontinuance and reminds the ALC of the requirement to document the case as described in AFMCI 23-103. To act on the discontinued part, the ALC determines which next higher assemblies use the part, and then calculates future requirements, and determines what resolution alternative (or mix of alternatives) it will use to meet the future demand.

The following paragraphs serve to emphasize possible DMSMS notification sources for Initial DMSMS alerts:

2.1 Part Manufacturer and Original Equipment Manufacturer (OEM)

Discontinuance notices are often received from the part manufacturer or the OEM. They usually notify only those customers who buy directly from one of their sales offices (for example, an Inventory Control Point such as a DLA supply center). Subsequently, the ICP makes broader dissemination of discontinuance alerts to users.

2.2 Defense Supply Center, Columbus (DSCC)

DSCC (formerly Defense Electronics Supply Center (DESC)) is one of the largest notification sources. Many manufacturers, OEMs, Inventory Control Points, and others report notices to DSCC who analyzes and disseminates the notices to the DoD user community. During the mid to late 1990s under the "Consumable Item Transfer (CIT) Program, management responsibility for thousands of consumable parts was transferred from the Army, Navy and Air Force to DLA (e.g., DSCC) further increasing the scope of products under DLA's cognizance. DSCC assigns case numbers, performs initial cursory reviews, identifies NSN's and then issues a notice to the military components that determine future requirements and provide that information to DSCC. DSCC aggregates the future requirements, reviews submitted information and compares the submitted quantities against on-hand stock and historical part issue data. DSCC then determines the appropriate resolution option (making a LOT Buy, identifying substitute stock, requesting engineering assistance, etc.) as needed. DSCC stores and issues components (note AFMCI 23-103 citation in Appendix F) and provides tools on the web to help OEMs and government agencies in developing alternative solutions for active devices. Two of the tools are called Standard Microcircuit Query Tool (microcircuits information) and QML (Qualified Manufacturers List) / QPL (Qualified Products List) Search and Query Tool (see Appendix E).

2.3 Government-Industry Data Exchange Program (GIDEP)

GIDEP alerts are generated when GIDEP is notified by a part manufacturer, a GIDEP user, DSCC, or others that a product line or part(s) is being / will be discontinued. GIDEP issues DMSMS "alerts" which include the manufacturer's final order date, the users response deadline date, alternate sources and case number references. DSCC DMSMS cases are also posted on the GIDEP MIS. GIDEP currently offers a service of matching digital files of your part numbers with those parts listed in GIDEP as being discontinued. As a part of the "Shared Data Warehouse" initiative (currently under development), GIDEP plans to become more integral to the process for reporting future DLA-parts requirements back to DSCC on parts being discontinued. This initiative envisions use of an on-line paperless system that will report military component requirements through GIDEP to DSCC,

track actions taken and maintain a history file on each discontinuance case. *If a DoD organization becomes aware of a manufacturer's plans to discontinue a DoD-used part, informing GIDEP will help ensure other DoD entities are also notified.*

2.4 AFMC DMSMS Program Manager

The AFMC DMSMS Program Manager may generate internal AFMC notices. Typically this applies in larger quantity cases. These notices would be based upon receipt of another notice (such as those listed above) and would be issued after research has identified a particular item or group of items to be the recipient's responsibility. The Hub utilizes tools such as AFMC's Applications, Programs and Indentures (API) database, to identify the next higher assemblies that use and are impacted by the discontinued part(s) and to send notices to those responsible for managing the affected assemblies.

2.5 Government Procurement & Repair Activities

Although the vast majority of "piece parts" / consumables are managed by DSCC, many unique parts still have their Inventory Control Point (ICP) at an Army, Navy or Air Force activity. For these parts, ICP DMSMS alerts are internal to the government and only sent to those activities with problem part numbers. These alerts are often the result of "no bid" or "not available" responses to equipment or part procurement / repair efforts by program / item managers. The Contractor will not usually be aware of this information unless notified by the Repair Activity or the System Program Office (SPO). The ICP should submit DMSMS case information to the GIDEP DMSMS database as required in AFMCI 23-103.

2.6 Military Parts Control Advisory Group (MPCAG)

MPCAG's have been established by DLA to assist DoD contractors in the selection of parts used for system design. DLA engineers serve as a bridge between the R&D and Logistics communities. DLA can help the acquisition activities control the proliferation and variety of nonstandard parts used in system design, enhance standardization, and minimize DMSMS impacts through the Parts Management Program. The Parts Management Program was previously detailed in MIL-HDBK-965. On 4 October, 2000 MIL-HDBK-965 was rescinded/canceled. Similar guidance with related information is now found in MIL-HDBK-512 available at the following web site: http://www.dscc.dla.mil/programs/mil512/index.htm. MPCAG alarms are actually a second type of DMSMS alert from DSCC. However, unlike the DSCC notices described in Section 2.2, MPCAG alarms are much less frequent and are distributed by the DSCC Parts Management function as a result of their responsibilities. As such, they usually result from a part or supplier being removed from the QPL or QML. A MPCAG Alarm is released in letter format to advise known MPCAG users of planned discontinuances by manufacturers that have Department of Defense (DoD) applications. DSCC will provide the DMSMS case number, the part name, the Federal Supply Class (FSC), the manufacturing code, and the National Stock Numbers. The MPCAG Alarm can also be released under an Agency Action Notice (AAN) through the GIDEP System.

2.7 System Engineering Community

It has become common for the System Engineering Community to adopt a vigorous, proactive approach to minimize the impact of obsolescence on their system. Increasingly, they maintain databases populated with information from manufacturers and suppliers that can provide early recognition of potential obsolescence cases. For example, the F-15 Program uses the Avionics Components Obsolescence Management (AVCOM) system while the B-2 Program uses i2's TACTrac system. A brief description of each is provided in Appendix D, and web links to data sources are provided at the AFMC DMSMS web site (Appendix E).

3. VERIFICATION

Once an alert notification is received or a discontinued item is otherwise identified, the next step is to estimate the extent to which a problem may exist. For example:

- ***For DLA managed parts that are being discontinued:*** The fact that a part is being discontinued may not ultimately present a problem if an adequate life-cycle stock is on hand, if there is no future requirement for the part, and so forth. However, DSCC as the buying agency may not be able to assess the adequacy of their inventory until all DoD activities calculate their future requirements and submit them to DSCC.
- ***For Air Force managed parts that are being discontinued:*** Again, this may not ultimately present a problem, however the Air Force logistics / buying activities assess historical demand data to assure future requirements can be met. If no requirements exist, the case may be closed. If the requirement exceeds existing inventory, additional analysis is necessary to determine the preferred acquisition option.

In summary, to identify the scope of a DMSMS problem, it is necessary to determine where the discontinued item is used and what the total future requirements are for each application. From this information, DSCC or the AFMC Item Manager (IM) aggregates requirements and considers factors such as what stockpile is available, and, historically, how often the part needs to be replaced to compute the actual future requirement. For DLA managed parts, the Hub consolidates and verifies Air Force future-use data.

Procedures for responding to discontinuances follow and may vary slightly depending upon which organization manages the item. Items managed by DSCC and items managed by the Air Force are discussed here. Overlaying the entire process is the responsibility of the System Engineering Community for assuring that the system is always operational. The System Engineering Community may have very active interfaces with each of the organizations involved in the obsolescence resolution process described below and, in some cases, recognizes a problem early, resolves that problem and informs the logistics community of the resolution.

We previously mentioned that to initially understand the scope of the discontinuance case requires an understanding of "what" part is being discontinued and "where" it is used. We'll first discuss in more detail the process for handling a DLA/DSCC managed part and secondly, an Air Force managed part.

3.1 For DLA/DSCC Managed Parts:

3.1.1 Understanding the Scope of the Problem

Often with help from the AFMC DMSMS Hub, ALC Next Higher Assembly (NHA) Item Managers identify the scope of a DMSMS problem by determining where the discontinued item is used (which NHAs are impacted) and what the total future requirements are for each next higher assembly. From this information, the AFMC DMSMS Program Office gathers future requirements from all ALCs, ensures the aggregated requirements are accurate and submits total AFMC requirements to DSCC. DSCC then collects all requirements from each military service and considers factors such as what stockpile is available, and historically, how often the part needs to be replaced to compute the actual future requirement.

An item for which an adequate life-cycle stock is on hand does not constitute a problem even though the item is being discontinued. Typically, five quarters of usage demand data is available for each item. This information is combined with future requirements to estimate total additional quantities of the item which are needed.

3.1.2 Current Process for Determining Future Requirements (DLA/DSCC managed parts)

The DMSMS Program Office / Hub uses a crucial source, the API data system (Refer to Appendix D for more API information) to identify the next higher assemblies that use the discontinued part(s). This provides system/program managers necessary information for submitting their requirements to the cognizant procurement source. An example worksheet produced by the API system is shown in Figure 3a. This document titled *Diminishing Manufacturing Source Item Worksheet* is a common form of AFMC alert (for a DLA managed part) and may be the initial request for information used to determine the severity of a DMSMS problem. The worksheet flows from API-generated data and is printed out at the ALC.

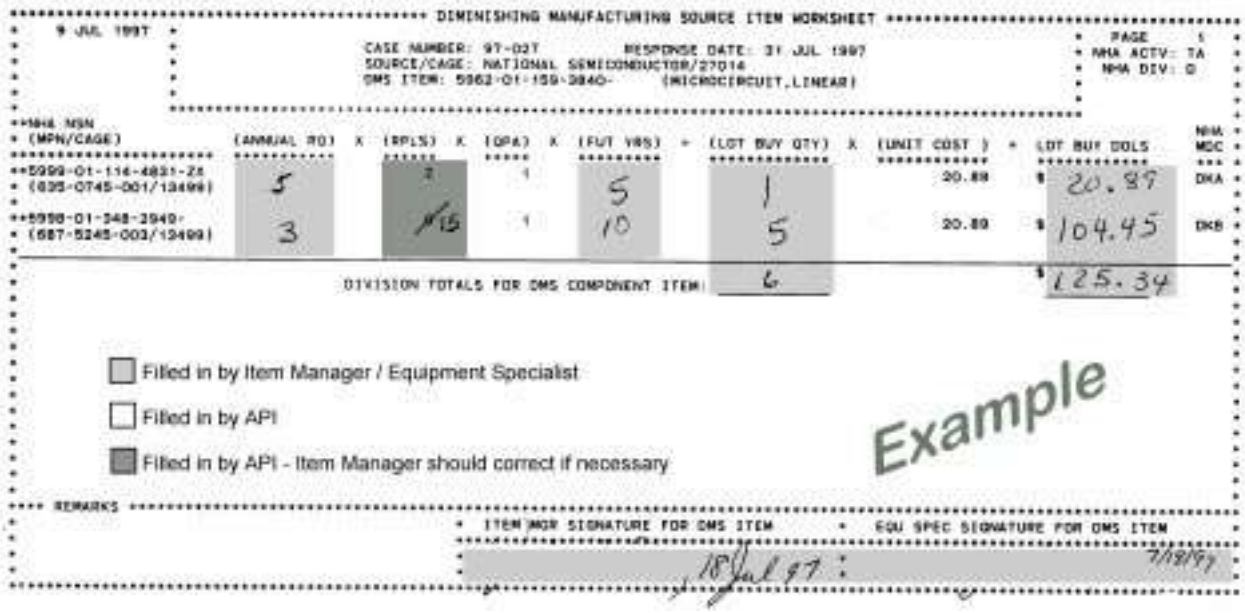


Figure 3a. API Generated Worksheet

The API data system fills in some fields (note legend, Figure 3a) on the worksheet, while the remainder are to be filled in by the recipient NHA Item Manager and / or Equipment Specialist. It is important to note that these individuals must coordinate with Systems Engineering to determine if some planned activity (e.g., a system modification) may preclude the need to maintain inventory for the discontinued part. The worksheet is then submitted through the appropriate ALC DMSMS focal point to the AFMC DMSMS Program Office for quality screening and aggregation.

Note: Signatures are required on The API-generated worksheets (Figure 3a). Specifically, each worksheet must be signed by the NHA Item Manager and the Equipment Specialist. Additionally, for projected requirements that exceed $100,000, the submitter must provide an explanation for the projection and have it signed at the division level or higher. Projections for $500,000 or more must be signed at the submitter's directorate level. For these high dollar projected requirements, in addition to the above signature requirements, the submitter can expect follow-on dialogue with the AFMC DMSMS Program Office and DLA (DSCC). The above dollar thresholds are subject to change.

When completing the information requested on the API worksheet, it may be helpful to consider guidelines used by various activities that have resulted in a more complete response. One such "tool" is the *DMSMS Case Verification Worksheet.* The worksheet and detailed instructions for

completing it are in Appendix G. This worksheet has been used to capture and summarize much of the data needed to determine discontinued part requirements prior to invoking an acquisition resolution alternative.

To stay informed of larger cases without creating unnecessary workloads, the DMSMS Program Office / Hub (AFRL/MLME) has implemented some procedural streamlining. One streamlining process is the submission of future requirements to DSCC in a digital form using the sequence and fields shown in Figure 3b. (Spreadsheet, comma separated, or tab delimited files).
These changes help ensure the timely resolution of large cases such as the Philips discontinuance (Case 97-002) which had 887 NSNs affecting many more NHAs. An additional benefit of maintaining digital archives of AFMC submitted requirements is the ability to quantify annual AFMC DMSMS requirements while maintaining metrics on ALC participation. Historically, the ALC with the best record of responding to DMSMS cases in the most timely and accurate manner is recognized for this achievement by the Command.

Case No.	NSN	Future Req.	Per Unit Cost	Total Cost	Requesting Organization
97-002	5962-01-286-2238[1]	231	$2.87	$662.97	SM-ALC/LIILT
97-002	5962-01-286-2238	50	$2.87	$143.50	SM-ALC/LIILR
97-002	5962-01-041-7282	60	$4.84	$290.40	SM-ALC/LIILA
97-002	5962-01-287-9495	27	$6.73	$181.71	SM-ALC/LIILT

Figure 3b. Example of Digital Format of Requested Future Requirements Submission

[1] It is not necessary to aggregate like items such as NSN 5962-01-286-2238 in this figure. This will be accomplished at AFRL/MLME. The "Requesting Organization" field data will be used when and if DSCC implements parts allocation priority to activities which filed LOT Buy requests.

Figures 3c (table) and 3d (flow chart) serve to further clarify the process for responding to discontinuance notifications for DLA (DSCC) managed parts.

Responsibility	Action Step(s)
DSCC	Notifies AFMC DMSMS Program Office of the discontinuance of DLA (DSCC) managed parts. This discontinuance alert is identified by a DSCC case number.
AFMC DMSMS Program Office	Processes the DSCC furnished parts list through the API to identify affected next higher assemblies (NHA), and generates "worksheets" which are printed out at each ALC for calculation of requirements.
ALC DMSMS Focal Point	Distributes worksheets to applicable NHA item managers whose assemblies are impacted by the parts being discontinued.
Item/Inventory Manager /Equipment Specialist	Completes appropriate sections of the "Diminishing Manufacturing Source Item Worksheet" indicating total requirements and providing an appropriate level of signature(s) depending on dollar level of part(s). Confers with system engineers.
Item/Inventory Manager	Returns completed worksheet(s) to the ALC DMSMS Focal Point.
ALC DMSMS Focal Point	Aggregates worksheet inputs to a spreadsheet (digital file) and forwards the file to the AFMC DMSMS Program Office.
AFMC DMSMS Program Office	Screens submitted requirements for accuracy and aggregates all submitted requirements on a single spreadsheet
AFMC DMSMS Program Office	Forwards (e-mail) the digital file containing AFMC requirements to DSCC.
DSCC	Determines and implements strategy for ensuring requirements are maintained (possibly an extended buy, no action or other action), and updates the DMSMS case history on the GIDEP management information system.

Figure 3c. (Table) DMSMS Alert Notification and Requirements Determination: DLA Managed Parts

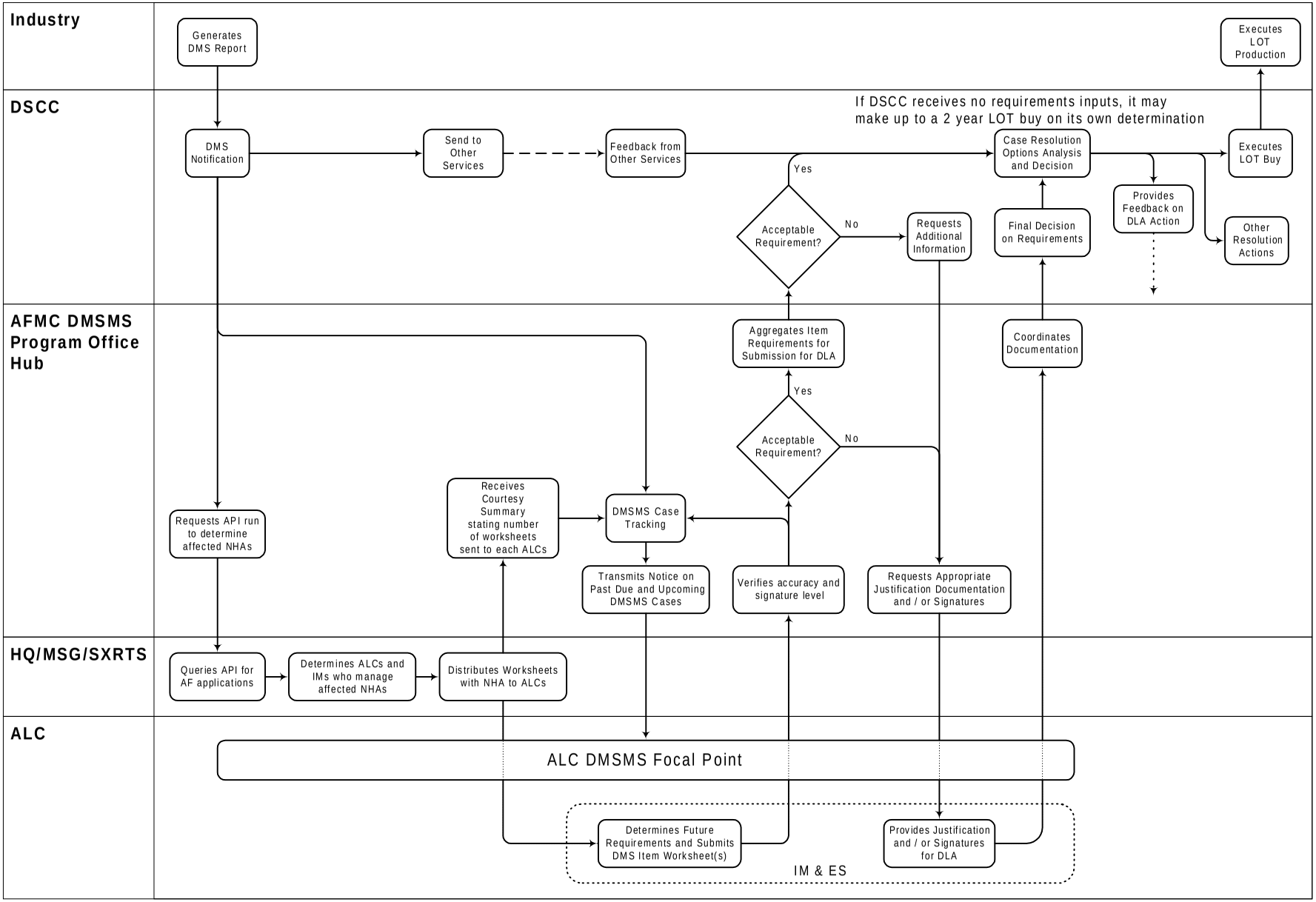


Figure 3d. (Flow Chart) DMSMS Alert Notification and Requirements Determination: DLA Managed Parts

3.2 Current Process for Determining Future Requirements (Air Force Managed Parts)

The current process is described as follows:

Responsibility	Action Step(s)
GIDEP, OEM, IMs, DSCC, etc.	Notifies AFMC DMSMS Program Office of discontinuance of Air Force Managed Parts
AFMC DMSMS Program Office	Notifies ALC GIDEP Focal Point of discontinuance of Air Force Managed Part(s) and the associated GIDEP document number. Additionally, provides a GIDEP "DMSMS Notice" form (Fig. 3 f) for completion and submission to GIDEP.
ALC GIDEP Focal Point	Notifies the appropriate Item / Inventory Manager using the a GIDEP "DMSMS Notice" form (Fig. 3 f) and monitors the timely return of the worksheet.
(Case Resolution):	
Item / Inventory Manager	Considers established case resolution guidelines (identifying NHAs and users, attenting to OSS&E policy and analysis options) for resolving the problem/case. Confers with system engineers.
Item / Inventory Manager	Selects approach to resolve DMSMS problem. Confers with system engineers.
Item / Inventory Manager	Documents case history on the GIDEP "DMSMS Notice" form (Fig 3f) and returns the form to the ALC GIDEP Focal Point for entry / submission to GIDEP.
ALC GIDEP Focal Point	Updates the DMSMS case history on the GIDEP management information system.
AFMC DMSMS Program Office Follow-up and Close Out	Accesses GIDEP's web site to ensure case has been documented, and follows up with the ALC GIDEP Focal Point, as necessary.

Note: Often stock control personnel become aware of a part becoming a "DMSMS item" when they attempt to purchase the item and it is no longer available. It is at these times that a review of historical demand and initial consideration of a needed fix occurs. If no immediate fix is determined, stock control notifies the item manager who begins coordinating a resolution.

Figure 3e. (Table) DMSMS Alert Notification and Requirements Determination: AF Managed Parts

GOVERNMENT - INDUSTRY DATA EXCHANGE PROGRAM

DMSMS NOTICE

DIMINISHING MANUFACTURING SOURCES AND MATERIAL SHORTAGES

1. TITLE			2. DOCUMENT NUMBER 3. DATE *(Year, Month, Date)*
4. MANUFACTURER NAME AND ADDRESS		5. MANUFACTURER POINT OF CONTACT (NAME) 6. MANUFACTURER POINT OF CONTACT TELEPHONE	
7. CAGE CODE (H4)	8. MANUFACTURER FINAL ORDER DATE	9. MANUFACTURER PART NUMBER	10. BASE PART
11. DOCUMENT ORIGINATOR		12. GOVERNMENT PART NUMBER	13. SPECIFICATION NUMBER
		14. TYPE DESIGNATOR	15. MODEL NUMBER
		16. NATIONAL STOCK NUMBER (NSN)	17. DRAWING NUMBER
18. COMMENTS			

FOR GOVERNMENT AGENCIES USE ONLY

19. FEDERAL GOVERNMENT NAME AND ADDRESS	20. FEDERAL GOVERNMENT POINT OF CONTACT NAME 21. FEDERAL GOVERNMENT POINT OF CONTACT TELEPHONE	
22. CASE NUMBER	23. USER RESPONSE DEADLINE DATE	24. ROUTING IDENTIFIER CODE
25. SOLUTION /STATUS CODE	26. USERS	

DD FORM (DRAFT)

Figure 3f. GIDEP Form: "DMSMS Notice"

Air Force Diminishing Manufacturing Source
Air Force Managed Parts Process

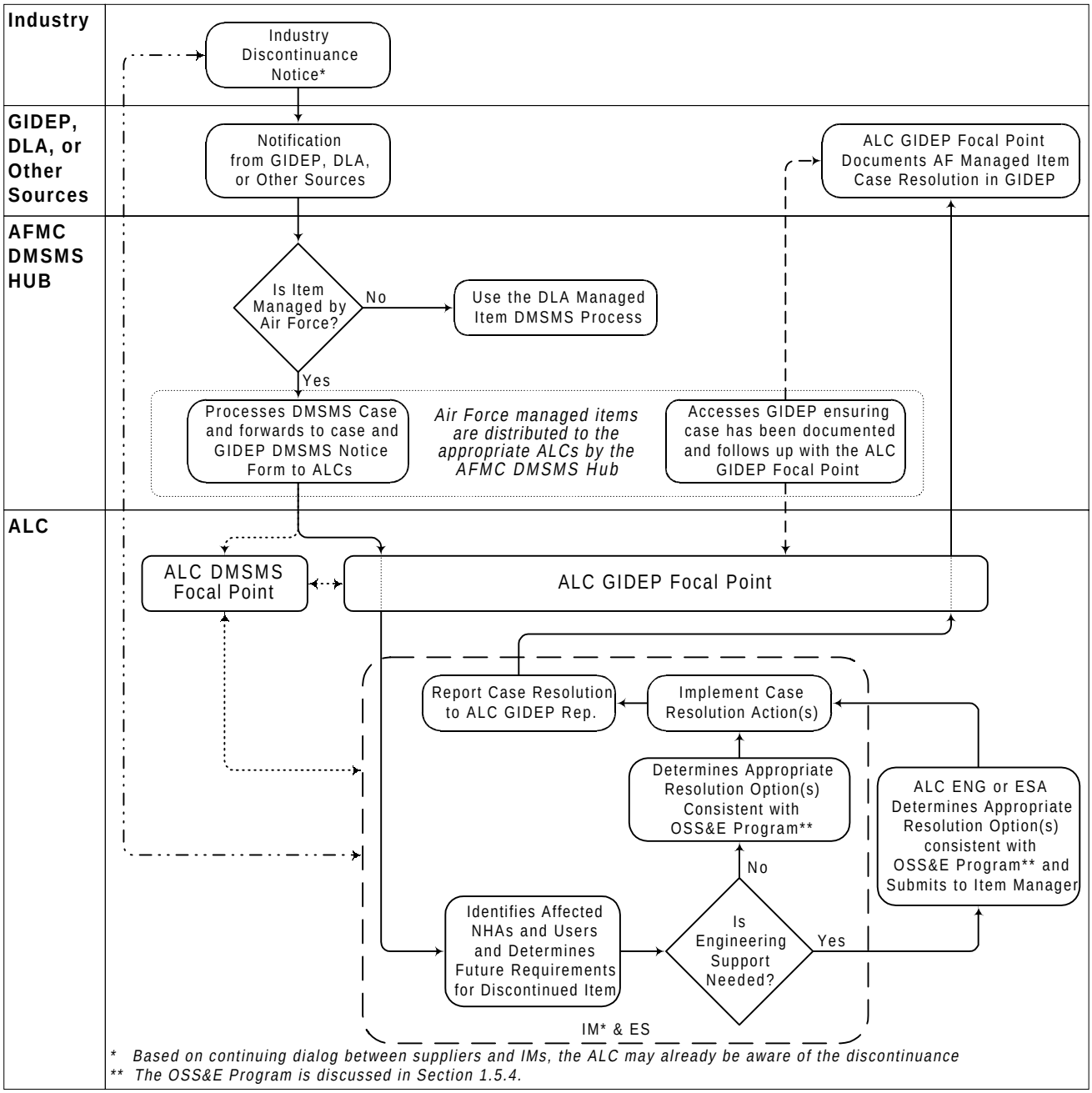


Figure 3g. (Flow Chart) DMSMS Alert Notification and Requirements Determination: AF Managed Parts

4. OPTIONS ANALYSIS

Once a discontinuance notice is received by the inventory control point and it has been verified that a problem does exist, case analysis begins. This process requires collecting and organizing the related data for each case; considering the impact and scope of the problem, as well as specific issues and constraints surrounding the case, and analyzing all of the combined data to determine which resolution options provide the best benefits for solving the DMSMS problem. As we move into the "Options Analysis" step, an important point should be made. This step does not simply isolate the problem to the Inventory Control Point. For example, if the discontinued item is a DLA managed part, the burden of step 4: "Options Analysis" and step 5, "Resolution and Implementation" gets implemented by DLA. However, depending on existing inventory, criticality of the part, etc., Air Force users often remain involved, at least at an awareness level with the progress of these steps. If the discontinued item is an Air Force managed part, the Air Force ICP assumes the responsibility to resolve the issue and coordinate as necessary with other ALCs or military services who also use the part.

4.1 DoD Teaming Group

One support group for options analysis is comprised of DoD and industry representatives, the group attempts to focus on discontinued electronic components that are common to multiple weapon systems and, for which there are no available sources. Cases are established for discussion at Teaming Group meetings, which are held quarterly and via teleconference. The objective is to determine situations when a joint resolution can be implemented that can result in lower costs (e.g., based on shared non-recurring engineering costs or economies-of-scale), thereby benefiting participating members (weapon systems). The group maintains a database to track issues of interest and to be better able to describe the benefits of participating. A brief description of the database is provided in Appendix D, "DMSMS Case Resolution Data Sources". For more information on this group, contact one of the two chairs:

- Jerry Martinez (805) 228-8197, e-mail: martinez_jerry@phdnswc.nswses.navy.mil
- Jack McDermott (781) 377-6837, e-mail: Mcdermottj@hanscom.af.mil

Alternately, contact the AFMC DMSMS Program Office:

JAMES NEELY
AFRL/MLME

WPAFB, OH 45433
Voice: (937) 904-4374 DSN: 674-4374
Fax: (937) 656-4420 DSN: 986-4420
email: James.Neely@wpafb.af.mil

MONICA POELKING
AFRL/MLME

WPAFB, OH 45433
Voice: (937) 904-4352 DSN: 674-4352
Fax: (937) 656-4420 DSN: 986-4420
e-mail: Monica.Poelking@wpafb.af.mil

4.2 Resolution Alternatives

Numerous resolution alternatives exist which may be used singularly or in combination, as shown below (Figure 4a).

Common DMSMS Program Resolution Alternatives

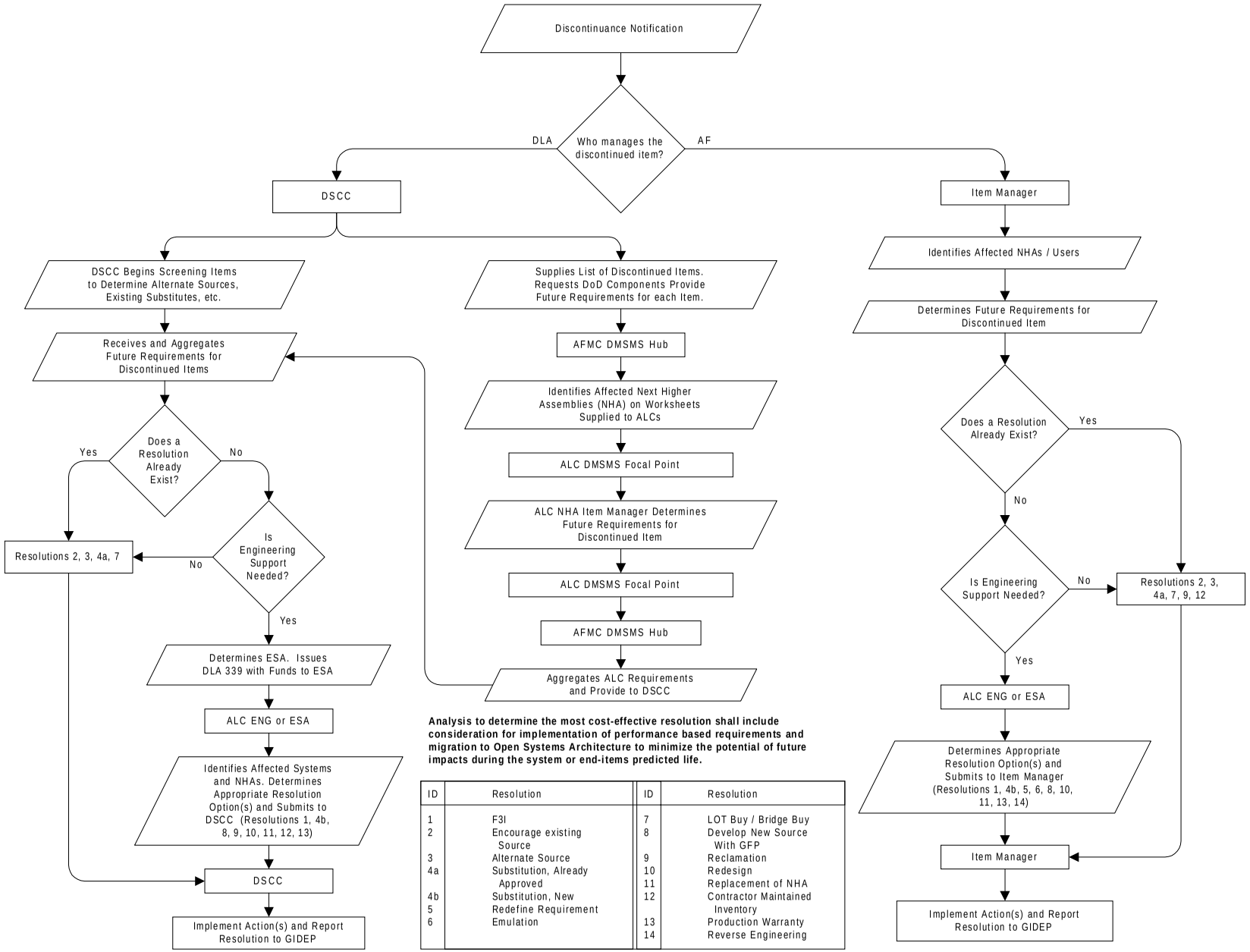
- Form, Fit, Function Interface (F^3I)
- Encourage Existing Source
- Alternate Source (e.g., Aftermarket Manufacturers)
- Substitution
- Redefine Requirement to Accept Commercial Item
- Emulation
- Life-of-Type (LOT) Buy
- Develop New Source Using Available GFP
- Reclamation of DMSMS Part
- Redesign End Item
- Replacement of Next Higher Assembly
- Contractor Maintained Inventory
- Production Warranty
- Reverse Engineering (RE)

Figure 4a. Common DMSMS Resolution Alternatives

The DMSMS Resolution Alternatives Flow Chart for DSCC and AF Managed Parts (Figure 4b) provides a decision algorithm giving necessary context to the broad consideration of these alternatives. **Appendix A** describes specific analysis considerations for each resolution alternative**.** This appendix is considered a very important element of this guide.

If engineering support is needed from an engineering support activity (ESA), it is requested on “DLA Form 339” (Appendix G, G-9). The DLA Form 339 is often forwarded to the cognizant system engineers for action, coordination, or confirmation of system compatibility.

To reiterate, it is important to start by asking the question, “Who manages this part?” If, for example, DLA (DSCC) manages the part, DSCC will play a major role in deciding which alternatives are appropriate. However, DSCC will, as appropriate, request support from cognizant ESAs.



Analysis to determine the most cost-effective resolution shall include consideration for implementation of performance based requirements and migration to Open Systems Architecture to minimize the potential of future impacts during the system or end-items predicted life.

ID	Resolution	ID	Resolution
1	F3I	7	LOT Buy / Bridge Buy
2	Encourage existing Source	8	Develop New Source With GFP
3	Alternate Source	9	Reclamation
4a	Substitution, Already Approved	10	Redesign
4b	Substitution, New	11	Replacement of NHA
5	Redefine Requirement	12	Contractor Maintained Inventory
6	Emulation	13	Production Warranty
		14	Reverse Engineering

Figure 4b. The DMSMS Resolution Process Flow Chart for DSCC and AF Managed Parts

4.3 Major Considerations

4.3.1 Resolution Alternatives: Impacts Matrix

The following two pages (Figure 4c) provide “An Assessment of Resolution Alternatives” matrix / table to further help assess the most appropriate DMSMS resolution option(s).

4.3.2 Acquisition of Technical and Logistics Information

Pertinent data on the DMSMS item, such as drawings, test information and other existing technical data should be collected. It is important to gather information about next higher assemblies along with procurement information such as Contractor Technical Information Coding (CTIC) or other breakout data, and any other relevant information required for case analysis.

Data collection and validation often require close coordination with prime system manufacturer / vendors. Some drawings originally delivered may prove to be insufficient or incomplete for DMSMS analysis. If the drawings are proprietary or not available, the cost of characterization, testing or reverse engineering to develop a technical package for review should be addressed. The lack of available data and cost information can seriously impact DMSMS cases and their resolutions.

Having the ability to cross-reference various types of part numbers for the same part is very important. For example, a generic part number for a microcircuit may have a vendor written specification control drawing, a DSCC prepared standard military drawing, and possibly a mil part number such as M38510/xxxxx. In addition, this same part may be stock listed (with a national stock number). All these part numbers are necessary because a given solution must relate to the specific part number used. The national stock number is necessary because the user may be able to benefit from a previous government procurement.

4.3.3 Documentation

Case resolution alternative analyses should be documented. One example form of documentation is the DMSMS Case Resolution Analysis Worksheet provided (Appendix G, G-8).

4.3.4 Combining Resolution Alternatives

The alternatives listed in Appendix A are not necessarily mutually exclusive. The potential may exist to combine resolution options to achieve cost, technical or schedule benefits. For example, modified LOT buys (called “bridge buys”) may be made to provide sufficient stopgap materiel while longer term design-related alternatives are pursued. Therefore, throughout the case investigation process, the potential for integrating elements of different solution methodologies to support cost-effective resolutions should be considered.

4.3.5 Continued Coordination

It is important to continue to work closely with the manufacturers and other DMSMS points of contact (POC’s) to ensure availability of comprehensive case data. Communication should be maintained with other impacted activities to maximize exchange of pertinent information and provide technical and economic leverage associated with combining resolution efforts (as appropriate). When resolving a DMSMS case, repeated attempts are made to coordinate with the DMSMS item manufacturer to support interim or long term production needs. Manufacturer plans or decision factors may change. New information obtained may persuade the manufacturer to extend final production dates. Continued attempts at alternate part or supplier identification should also be pursued. Even at this stage in the case investigation, resolutions which may avoid the extensive time and resource impacts associated with the alternatives discussed below should remain as options.

DMSMS CASE RESOLUTION GUIDE - RESOLUTION ALTERNATIVES

Analysis to determine the most cost-effective resolution shall include consideration for implementation of performance based requirements and migration to Open Systems Architecture to minimize the potential of future impacts during the system or end-items predicted life.

The following table details considerations for evaluating the fit of each option against the case in progress.

Assessment of DMSMS Resolution Alternatives

Resolution Alternative	Non-Recurring Cost Impact	Recurring Cost Impact	Schedule Impact	Lasting Effect - Performance of Action - How long will that action be effective?
1. Encourage existing source to continue production.	Low, could involve premium.	Potentially higher.	Minimal.	• Temporary unless source is provided a long term forecast of market viability.
2. Find alternative source.	Potentially higher.	Could require requalification.	Potentially lengthy.	• Temporary if market condition for alternate source is the same as for initial source. • Potentially long term if alternate is also used on other products. Combined demands could lengthen market viability.
3. Substitute part (same Form, Fit, Function).				
• Obtain existing substitute item.	Low, but could require requalification.	Low.	Minimal impact, if available.	• Temporary if market condition for alternate source is the same as for initial source. • Potentially long term if substitute is also used on other products. Combined demands could lengthen market viability.
• Obtain existing substitute item (de-rated)	Potentially high. Could require requalification	Low.	Potentially high impact if requalification prior to procurement required.	• Temporary if market condition for alternate source is the same as for initial (preferred) source. • Potentially long term if substitute is also used on other products. Combined demands could lengthen market viability.
4. Redefine / tailor military specification requirements.	Minimal. Could require limited qualification.	Low.	Minimal.	• Dependent upon the reason for the “obsolescence/non-availability”.
5. Emulation technology. (Procudre part with emulated functions, Produce substitute item).	High. Redesign / Requalification.	Minimal.	High impact. Lead time and requalification required.	• Dependent upon the reason for the “obsolescence/non-availability”. • If non-available due to market viability - the condition could recur near term. • If due to technology obsolescence, could be a long term fix.
6. Life-of-Type (LOT) Buy / Bridge Buy.	Cost of Inventory only. Risk of downstream obsolescence.	Minimal. Could be lower with higher quantity buy.	Minimal.	• Long term if calculations are correct.

For More Information, Services, and Support on DMSMS Problems - Visit the AFMC DMSMS HUB website at http://www.ml.afrl.af.mil/ib/dpdsp/dmsms.htm

Figure 4c. An Assessment of Resolution Alternatives

DMSMS CASE RESOLUTION GUIDE - RESOLUTION ALTERNATIVES

Assessment of DMSMS Resolution Alternatives				
Resolution Alternative	**Non-Recurring Cost Impact**	**Recurring Cost Impact**	**Schedule Impact**	**Lasting Effect - Performance of Action - How long will that action be effective?**
7. Change "prime" sources if item uses GFM.	High. Requalification needed.	Low.	High impact. Lead time & requalification required.	• Dependent upon the reason for the "obsolescence/non-availability". • If non-available due to market viability - the condition could recur near term.
8. Reclamation of existing items.	Low.	Low.	Minimal.	• Short term (Cannibalize).
9. Modify or redesign the end item to replace or eliminate.	High.	High.	High Impact.	• Dependent upon the reason for the "obsolescence/non-availability". • If non-available due to market viability - the condition could recur near term.
10. Replace Item.				
• Replace the entire system.	High.	High.	Lengthy.	• Dependent upon the reason for the "obsolescence/non-availability". • If non-available due to market viability - the condition could recur near term.
• Replace NHA.	Varies by case. Requires FFF analysis. May require requalification/ retesting.	Varies by case. Requires FFF analysis. May require requalification or retesting.	Varies. May be long if requalification or retesting needed.	• Could be long term if replaced item has a longer expected life.
• Replace with newer technology.	Varies by case. Requires FFF analysis. May require requalification/ retesting.	Varies by case. Requires FFF analysis. May require requalification/ retesting.	Varies. May be long if requalification or retesting needed.	• If newer technology available, it could increase effect of action significantly and as by-product could enhance functionality and/or performance.
11. Require the using contractor to maintain inventory.	Cost of Inventory only. Risk of downstream obsolescence.	Minimal. Could be lower with higher quantity buy.	Minimal.	• Similar to LOT Buy. • Title III type action.
12. Obtain production warranty.	Low.	Low.	Minimal.	• Title III type action.
13. Reverse Engineering (RE).	High. May require requalification.	Low.	Dependent upon redesign. Some.	• Dependent upon the reason for the "obsolescence/non-availability". • If non-available due to market viability - the condition could recur near term.
14. DPA Title I.	Minimal.	Low. May involve premium.	Minimal.	• Temporary.

For More Information, Services, and Support on DMSMS Problems - Visit the AFMC DMSMS HUB website at http://www.ml.afrl.af.mil/ib/dpdsp/dmsms.htm

Figure 4c (continued). An Assessment of Resolution Alternatives

4.3.6 Acquisition Reform Issues

As mentioned previously, for initial design or redesign, acquisition reform initiatives call for increased attention to F³I. The selection of any non-F³I solution must be justified as lower in life-cycle cost, shorter in schedule impact, or a case where F³I is not applicable. None the less, in each case a baseline evaluation of all available options should be accomplished to facilitate comprehensive resolution analyses.

4.3.7 "The Big Picture"

In evaluating a response option, "design options" are weighed against "logistics options" - that is, those actions which result in major system engineering changes versus those which entail continued use of the DMSMS item or an approved replacement. Both approaches have distinct advantages and disadvantages. When considering design solutions, it is recognized that although some may provide performance enhancements resulting in upgraded system capabilities, the new configuration items will also have the potential to become a DMSMS problem at some point. Logistics options will theoretically provide life-cycle DMSMS solutions; however, depending on the system / equipment in question, the potential may exist for continued and cumulative DMSMS impacts as the system ages. This comparison may be directly applied to the cost analysis as well. Design options, although traditionally more expensive, may be justified in part by projected performance enhancements. While logistics options may initially be less expensive, potential outyear DMSMS impacts may create substantial long-term costs.

There is no precise method for quantifying all of the potential costs / benefits of the resolution options; however the issues mentioned above should be considered when developing the technical and cost analyses in support of the resolution options which follow.

4.3.8 Next Higher Assembly Assessment

The system that the obsolete part resides in should be analyzed to assess the desirability of replacing the next higher assembly, a subsystem or even an entire system. This option could be very attractive if there are a large number of parts becoming obsolete in the system or if significant performance gains are possible. If this option appears attractive, F3I should be considered.

The rapid rate of change in electronics technology has resulted in frequent changes in electronics systems to achieve increased performance, cost reductions, or maintenance benefits. If such a change is planned or programmed for a system facing a DMSMS problem, the choice of resolution will be affected. It is, therefore, critical that the SPO or technology organization that might be implementing such a modification be contacted prior to finalizing the DMSMS problem resolution path. One roadmap, "The Avionics Planning Baseline" identifies all funded modifications. For more information contact the DMSMS Program Office / Hub.

4.3.9 Establishing Resolution Priorities

An initial screening is used to prioritize the remaining alternatives. For instance, if the obsolete part is a very complex integrated circuit, it may be difficult and prohibitively expensive to emulate. Thus, the emulation alternative becomes very low in priority.

A complete analysis of all resolution options is usually costly and time consuming. Alternatives should be tailored to provide the best solution in an appropriate time frame at the lowest possible cost.

4.3.10 Market Research: Required Emphasis

There is a statutory requirement to acquire commercial items when they are available. To make this commerciality determination requires comparing *market research* to Government *requirements*.

Market research is a process used to collect, organize, maintain, analyze and present data for the purpose of maximizing the capabilities, technology and competitive forces of the marketplace to meet an organization's needs for supplies and services.

Policy: The Federal Acquisition Streamlining Act (FASA) established a very broad definition of commercial items (FAR Part 12) and created a statutory preference for their acquisition by federal agencies. In order to determine the availability of suitable commercial items in the marketplace, market research was identified by FASA as the first step in any acquisition, before developing new requirements (specifications and standards). Market research is also prescribed before soliciting offers for acquisitions estimated to exceed the Simplified Acquisition Threshold (SAT), or below the SAT when market information is needed and the cost of gathering it can be justified. The SAT is currently $100,000. Additionally, simplified acquisition procedures (SAP) can be used for commercial item buys up to $5 million. There is a requirement to comply with FAR 7.102 to conduct market research for all acquisitions in order to promote and provide for acquisition of commercial items and full and open competition.

Market research policy vis-à-vis DMSMS processes and responsibilities: The above policy addresses acquisition planning. However, for DSCC managed parts, DSCC is the procuring activity and is therefore subject to the policy. When AFMC units receive DSCC discontinuance cases, the requirements that are submitted help DSCC meet FASA requirements. Planned acquisitions for Air Force managed parts are subject to FASA requirements since AFMC units not only determine future requirements, they must acquire the items.

Based on legislative and policy changes, Government buyers are no longer focused on creating goods or services, but with finding commercial solutions. Market research is accomplished to support the acquisition of commercial items and services. You may be asked to assist the market research team by collecting market and product data from internal and external sources in order to:

(1) determine the availability of commercial items that can satisfy agency requirements, and

(2) identify standard commercial practices, terms, conditions, and other information that will help fashion an appropriate solicitation.

According to the Federal Acquisition Institute, market research involves nine tasks to ensure a thorough market research has been conducted:

1. Identify types of market information needed: Determine the most appropriate product, industry, and market data needed to define the requirement and to prepare the solicitation.
2. Review acquisition histories: Review the acquisition histories and the descriptions of the supplies and services to obtain information relevant to the acquisition.
3. Determine scope and extent of additional research: Identify what information you need and collect it as efficiently as possible. Large and complex procurements require you to gather more information than small procurements do. Remember do not invest more agency resources than necessary to get the job done.
4. Collect data from catalogs and periodicals: Data sources exist that will help you with market research for specific procurements as well as for your ongoing market surveillance. Familiarize yourself with these sources so that you can use them effectively.
5. Collect data from government sources: Identify and take advantage of all government data sources, especially the many government sponsored on-line information sources.
6. Collect data from industry buyers: Identify and use the knowledge of industry and state and local government officials.

7. Collect data from suppliers: Identify sources of supplier information, and take advantage of supplier knowledge and experience.
8. Collect data from trade associations: Use information from industry associations and watchdog groups to supplement information gathered from other sources.
9. Collect data from testing organizations : Use information from these sources to supplement information gathered from other sources.

The "Market Research/Analysis Guide" produced by the Air Force Logistics Management Agency is available at "http://www.il.hq.af.mil/aflma/lgc/lgcindex.html". This site provides a more detailed listing of web addresses related specifically to market research. Appendix E of this Case Resolution Guide references market research web sites that appear most congruent with DMSMS options analysis.

Additionally, DoD 5000.2-R requires that cost be treated as a military requirement. This requirement serves to emphasize the importance of addressing the reduction of total operational costs. Therefore such processes as the "Cost as an Independent Variable (CAIV)" and its associated process teams should be integral to DMSMS optional analysis, resolution and implementation.

4.3.11 System Engineering has a Key Role

The System Engineering Community is the ultimate authority in deciding the acceptability of any change that could have a negative effect on the operation of the system. There are many different systems engineering models and each office has latitude in structuring its management and engineering approach to the resolution of obsolescence cases.

A system life cycle begins with the user's needs and the capability requirements needed to satisfy mission objectives. Systems Engineering is essential in the earliest planning period, in conceiving the system concept and defining system requirements. As the detailed design is being done, systems engineers: 1) assure balanced influence of all required design specialties, 2) resolve interface problems, 3) conduct design reviews, 4) perform trade-off analyses, and 5) assist in verifying system performance.

During the Production phase, Systems Engineering is concerned with: 1) verifying system capability, 2) maintaining the system baseline, and 3) forming an analytical framework for producibility analysis.

During the Operational Support phase, systems engineering: 1) evaluates proposed changes to the systems, 2) establishes their effectiveness, 3) facilitates the effective incorporation of changes, modifications, and updates, and 4) conducts deficiency reporting to recommend areas of needed change.

4.3.12 The OSS&E Program

Although Section 1.5 discusses the relevance of the OSS&E program to DMSMS, it is important in this "Options Analysis" section to again emphasize its importance. AFMCI 23-103, Diminishing Manufacturing Sources and Materiel Shortages (DMSMS) Program, 13 October 2000 indicates, "Development of (DMSMS) resolution shall ensure the preservation of Operational Safety, Suitability, and Effectiveness baselines."

5. RESOLUTION & IMPLEMENTATION

Once the problem has been analyzed and the case profile factors weighed, a solution mix will be selected and implemented. Depending upon who manages the part and whether engineering support was needed to resolve the DMSMS case, the DSCC IM, AF IM, the ESA, or the System Engineering Community will select and implement the solution mix. This solution may include one or more of the resolution options / alternatives discussed. After implementation, the case history file is updated and Life Cycle DMSMS Management activities begin.

5.1 Resolution Alternatives

Once engineering and cost, schedule, and performance impacts of potential case resolution options are identified, the most cost efficient and technically effective approach (or blend of approaches) to resolve the particular DMSMS situation must be selected.

Generally, many alternatives are possible for a given DMSMS situation, but certain case circumstances may make some more attractive than others. Analysis of each practical option takes into account cost, execution time frames, and technical risk to make an efficient resolution decision. Moreover, there is a potential for combining different alternatives to support cost effective resolution efforts.

If a component or equipment configuration is already skewed towards obsolescence, DMSMS problems are likely to continue to multiply. In such a case, any resolutions implemented at the piece part level should be carefully weighed against component or equipment level initiatives, which eliminate multiple current and potential DMSMS problems.

Performance enhancements may be achievable because of the availability of advanced technology that was not available when the item was originally designed. Cost / benefit and funds availability analyses will help decide whether or not to incorporate the advanced technology. If both design and logistics options are available, assess the component / equipment DMSMS profile prior to finalizing an approach.

Other information derived in the course of case investigation may affect selection of resolution options. For example, as discussed in “major considerations” for DMSMS item case analysis (Section 4), availability of DMSMS item technical data may directly impact feasibility of logistics versus engineering alternatives.

Parameters that typically influence alternative selection include:

- **Number of Applications (#Apps):** The number of unique applications for a particular DMSMS items.
- **Future Demand:** The expected lifetime demand for the DMSMS item.
- **Time:** Projected time frame for item availability. The amount of time deemed available to evaluate, select and implement a resolution alternative while maintaining system / equipment readiness objectives.
- **DMSMS Profile:** The level of current DMSMS items within the impacted system, equipment or end-item.

5.2 Implementation

Once a resolution alternative has been selected, implementation begins. It is the responsibility of the individual who is the inventory control point (ICP) for that item to implement the appropriate solution. It should be noted, that while the item management community is responsible for ensuring an adequate supply of replacement items, current funding levels require that requests be prioritized. Purchase requests for future requirements are generally considered lower priority over purchase requests for current requirements. As with typical problem-solving models, implementation should also involve dialogue to ensure success and subsequently, an evaluation of the implemented solution.

5.3 DMSMS Data Management & Monitoring

5.3.1 DMSMS Case History File

AFMCI 23-103 requires AFMC Centers (principally ALCs) to maintain a history file of DMSMS Case resolution activity using the Government-Industry Data Exchange Program (GIDEP) database. For example, "if the resolution of the DMSMS case is to procure a LOT buy in excess of two years inventory, supporting documentation must be on record until less than 2 years inventory remains". Since each ICP will be responsible for documenting a case for a part it manages, the bulk of the AFMC documentation requirement relates to Air Force Managed parts, which are relatively few in number. Even when an AF activity does not manage a part, a case file is set up for the managing ICP to provide case documentation at GIDEP. If a non-item-managing activity has helpful information regarding the part, it is appropriate that they contribute comments to GIDEP to make the options analysis, resolution implementation, and the subsequent case history more robust. The files should be maintained to support follow-on analyses and to assist other divisions and government activities in conducting related DMSMS investigation efforts. As a corollary action, procedures should be established for tracking prospective sources, technologies or other DMSMS risk areas identified during case investigations. For example, conversations with manufacturers may indicate emerging DMSMS problems or broader supplier financial or technical circumstances that may affect continued production operations. Alternately, a predominance of DMSMS cases involving similar part types or technologies may suggest general obsolescence trends. Any such source / technology trends should be monitored in support of life cycle DMSMS management efforts.

5.3.2 Life Cycle DMSMS Management

The foundation for effective life cycle obsolescence management resides in careful integration of DMSMS program elements with system / equipment configuration control activities. Maintenance of accurate configuration data to the piece part level is essential in support of DMSMS impact assessments and associated resolution analyses. 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:

- **Configuration item identification & analysis**. Development and maintenance of current configuration item listings to the piece part level are essential to effective impact assessments and associated resolution analyses. Moreover, as system parts listed are definitized, line items should be subject to periodic technology / risk screening to identify existing and potential out year DMSMS problems.
- **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 should be slated for immediate investigation, with remaining line items categorized by projected out year availability. It may be desirable to further refine rankings 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).

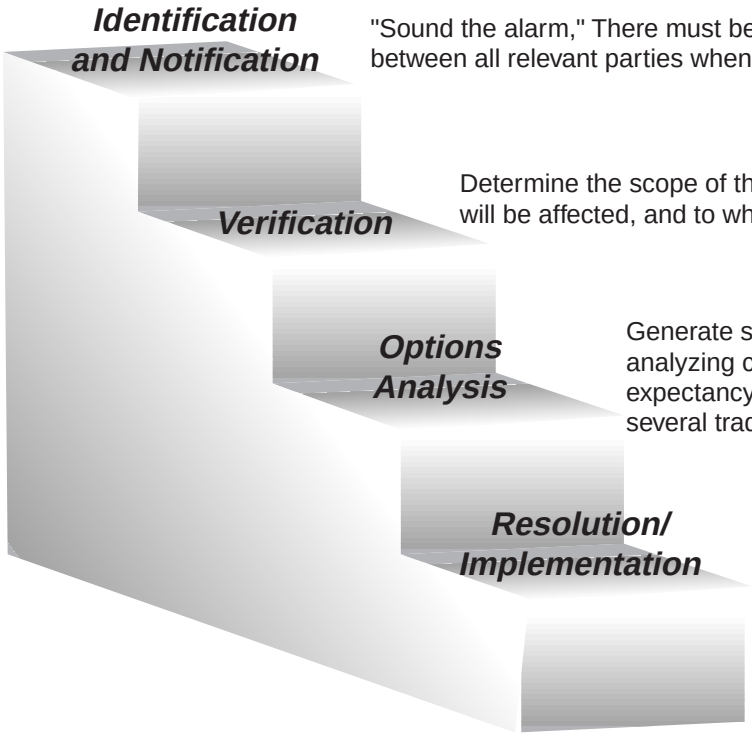
- **Periodic market assessment**. Although DMSMS screening has the potential to assist in statistical problem prediction, the accuracy of such forecasting for individual line items cannot be guaranteed. As discussed above, direct manufacturer coordination is often the only way to more precisely evaluate DMSMS vulnerability for specific items. The analyst should therefore establish a program of periodic contact with selected item manufacturers and other industrial organizations and government agencies in order to maximize early identification of DMSMS issues.

5.3.2.1 Other Life Cycle Management Information

- **DMSMS and obsolescence in a Mature Fighter Aircraft.** A Study of the F- 15 Radar System" by Captain John E. Bell (former student with the AFIT School of Logistics and Acquisition Management) provides conclusions and recommendations on DMSMS Management. The thesis can be obtained through the Defense Technical Information Center (DTIC) via web site: http://www.dtic.mil.

6. DMSMS RESOLUTION PROCESS SUMMARY

The world of DMSMS is constantly changing. Advances in technology present new opportunities and challenges. New players enter the arena and existing players assume new roles. Policy changes often revise responsibilities, thereby affecting the approach to DMSMS problems. Databases are constantly evolving and improved analysis techniques are being developed. Coordination using Internet assets is constantly improving as tools and training are developed and improved. This Guide has provided a logical resolution process with relevant issues to consider. In this world of change, a guide such as this can only be a snapshot in time. It is highly recommended that persons using the guide contact the AFMC Hub for the latest information, tools and training.



"Sound the alarm," There must be quick and concise communication between all relevant parties when a DMSMS case first occurs.

Determine the scope of the problem, discerning which systems will be affected, and to what extent.

Generate solutions to the problem, collecting data and analyzing case-specific issues such as cost and life expectancy. The best solution may be combination of several traditional methods.

Determine a best solution and discern methods for implementing that best solution, including methodologies, financial budgets, expected time frames, and specific responsibilities of the parties involved.

Now let's move beyond basic processes to **Section 7**, and briefingly discuss:

<u>planning for obsolescence</u> avoidance...

7. PLANNING FOR OBSOLESCENCE AVOIDANCE

Technically, obsolescence has been an issue since parts procurement began. When it acquired the status of a major problem and was designated, “DMSMS”, concerted efforts were initiated to deal with the problem. From the early beginnings of DMSMS it was recognized that the best approach to resolving the problem would be to prevent it from happening. This admirable goal, often referred to as “being proactive”, has been very difficult to achieve.

The unavoidable fact was that parts obsolescence cases were occurring and purely reactive measures were being taken to resolve those cases. A Command-wide capability is evolving to address pressing DMSMS problems but the desire to acquire a capability to foresee situations and prevent them from becoming problems has always been a goal.

This guide is aimed at lessening or eliminating the risks caused by parts non-availability before the weapon system is adversely affected. Initially, this guide focused (in Sections 2 - 6) on the active risk management process that takes place upon being notified of a discontinuance in an effort to preclude actual impact to the weapon system (low involvement, yet Proactive). ***This section discusses higher proactive involvement levels for controlling risk***.

7.1 Risk Management.

An excellent approach to resolving DMSMS issues is to include a requirement in the Statement of Work. This way the bidder can propose their approach to minimize the impact of obsolescence occurrences during the life of the system. The importance attached to this requirement must be reflected in the proposal evaluation criteria. In the early stages of program development, parts obsolescence is not usually given high priority but the pay-off for some foresight over the life of the system can be very high. Good risk management dictates that high risk should be accepted only insofar as it can be justified by high expected returns. Planning for risk management for the life cycle of the asset prior to Preliminary Design Review (PDR) and Critical Design Review (CDR) should be considered in every acquisition. It is during this time (before the design is set that highest paybacks or cost avoidances are realized. After design is complete, the cost to fix goes up exponentially. Cost avoidances can be calculated using the DMEA costing model that can be obtained from their web site (Appendix E).

The types of risk which agencies face include schedule, cost (both acquisition and life-cycle), technical obsolescence, feasibility, reliability and risk of project failure, dependencies between a new project and other projects or systems, and risk of creating a monopoly for future procurement. The technical obsolescence risk is the heart of the DMSMS concern. Risk management implies control of possible future events and is proactive rather than reactive. The elements of risk management are congruent with this guide’s “DMSMS Resolution Process” and most problem solving processes. Risk management process elements include (but are not limited to):

a. **Risk Assessment.** The first step in risk management is to identify and assess all potential risk areas. A risk area is any part of a project where there is an uncertainty regarding future events that could have a detrimental effect on meeting the program goal. Risk assessment continues throughout the life cycle of a program. As the program progresses, previous uncertainties will become known and new uncertainties will arise. Assessing the DMSMS risk can be daunting.

b. **Risk Analysis.** Once risks are identified, each risk should be characterized as to the likelihood of its occurrence and the severity of potential consequences. Risk analysis will result in a “watch list” of potential areas of risk. The watch list may identify early warning signs that a problem is going to arise. As in risk assessment, risk analysis continues through the life cycle of the program; the watch list should be updated as appropriate. A watch list for electronic parts should be updated at least monthly (The B-2’s DMSMS Management Plan discusses timing for addressing different levels of risk).

c. **Risk Treatment.** After a risk has been assessed and analyzed, the agency should consider what to do about it. The agency may:

- assume the risk if it is in the best position to exercise effective control, the probability of risk is small, or the potential damage is either minimal or too great for the contractor to bear.
- share the risk with the contractor.
- transfer the risk to the contractor or some third party.
- select alternative solutions that avoid the risk.
- take the necessary measures to minimize the likelihood that the risk will occur, minimize the damage to program goals should it occur (e.g., contingency plans), or both.

A search on "risk management" in the "Defense Acquisition Deskbook" for DoD documents would result in a list of hundreds of documents. An excellent resource is the "Risk Management Guide for DoD Acquisition" authored by the Defense Acquisition University, Defense Systems Management College. The "DSMC Risk Management Guide for DoD Acquisition" is available for download from: WWW.deskbook.osd.mil or the Deskbook Compact Disk.

7.2 Proactive DMSMS Approaches:

DMSMS is a serious problem, and an unavoidable one. But it is also one that can be effectively managed, if clear communications and a clearly defined, systematic plan of attack is used. Approaches for proactive DMSMS Management include:

a. **System Program Office (SPO) DMSMS Management Activity**. The reasons for putting in place a SPO DMSMS management team range from controlling the cost of system ownership to ensuring the system is operational. In effect, this team becomes a risk management team. Structured processes often detailed in a management plan are considered fundamental to a successful effort. Additionally, capturing metrics that demonstrates the effort is cost effective supports the continuance of the DMSMS management activity. Team composition and processes should foster dialogue with suppliers and end users. ***Specific examples of AFMC team efforts are cited in paragraph 7.3.2***.

b. **Availability Guarantees (contractual approach)**. Under some circumstances, a supplier may guarantee long term availability of a part or family of parts. Because of the uncertainties inherent in such an arrangement, the cost is very high, if a contract is even feasible. Contractual approaches may lead to transferring the obsolescence problem from the government to industry or it may lead to new design approaches or system operation regimens.

c. **Utilizing Early-Warning Databases**. One traditional approach to implementing the reactive approach to resolving obsolescence cases has been to develop and maintain detailed databases that contain information about every part in the system. These databases can become proactive tools if projections of the obsolescence of each part can be incorporated into the database and a systems health analysis can be performed. With a database including all of the systems' indentured parts list and a projection of parts obsolescence, a system manager could decide the optimum level (part, board, subsystem or system) of replacement, and the schedule for those replacements to maintain the functionality of the system. Of course, this process must also consider part reliability. Also, maintaining the data electronically allows quick research of obsolescence notices. This type of analysis supports the manager's programming for the funds to accomplish the needed replacements. Another reason to have the complete set of system parts in an electronic database is that you can utilize electronic comparison routines that exist to compare the parts you have versus the obsolescence notices that originate from multiple sources (e.g., GIDEP and DSCC). Unfortunately, the accuracy of prediction of parts obsolescence has been spotty. Some of the reasons for this lack of visibility are mentioned in

Section 1 as "Challenges to effective DMSMS management". ***Additional information on data sources is referenced in Appendix D and the DMSMS Program Office web site.***

d. **Open Systems Architecture (OSA**). OSA is a business and engineering strategy that seeks to develop Systems Architectures that employ the use of open systems interface standards to the maximum extent practical. An open systems interface standard is a publicly available document defining specifications for interfaces, services, protocols, or data formats established by consensus, and is widely used in the market. The OSA objective is to improve weapon system affordability and sustainment by reducing impacts associated with anomalies such as out-of-production parts, technology obsolescence, and single source suppliers. The Under Secretary of Defense for Acquisition and Technology, in 1994, directed DoD Acquisition Executives to use "open systems" specifications and standards for acquisition of all weapon systems to the greatest extent practical. An Open Systems Joint Task Force was established to assist DoD implementation of open systems. ***Additional information on OSA Policy, Tools and Guides, Articles, and Training can be found at the OSA web site referenced in Section 7.5****.*

Additionally, given the importance of this subject and the need to provide continuity in reading the remainder of Section 7, we have elected to defer "**Open Systems Architecture: Frequently Asked Questions**" to Section **7.5**.

e. **Design for Obsolescence: VHDL.** The over-riding design criteria for electronic systems for aircraft have been maximum functionality and performance in the smallest space. A challenge for designers of all new systems is to design for affordable change in both hardware and software. This change is driven by a number of factors and obsolescence is a major one. The increasing use of COTS is contributing to an increase in the obsolescence problem and the treatment of life cycle cost as an independent variable is introducing a new design constraint. This change of philosophy applies to the redesign of parts of a system as well as to the original design. One important initiative for attending to obsolescence in the design phase is Open Systems Architecture (mentioned above). Another important consideration is the use of VHDL. The Very High Speed Integrated Circuit (VHSIC) Hardware Descriptive Language (VHDL) has become a standard design tool throughout much of the electronics industry. Components, boards or systems designed using VHDL are described in such a way that replacement with different components is very straightforward. In particular, the replacement of a part or any assembly of parts with newer or different technology does not require redesign. In order for VHDL to be used effectively, it has to be added to the contract. The contractual requirement should be to deliver to the government, with unlimited rights, a behavioral VHDL model with test bench, for digital components. **Section 7.3.2-d provides a reference to an excellent tutorial on VHDL.**

f. **Periodic Replacement (often called Technology Insertion or Refresh)**. Another approach is to replace the electronics in a system every three to five years. Parts that become obsolete before they are scheduled for replacement need only be stockpiled for a short time. A draw back to this approach is that it is usually quite expensive but this expense may be offset by the improved operational capability afforded by the early incorporation of later, more sophisticated technology.

g. **Early-Life-Cycle Parts Procurement**. While an obsolescence event is difficult to predict, the date a technology or part was introduced into the market is not. Judicious part selection for a replacement of an obsolescent part or as a component in a new design can prevent or delay obsolescence. Selecting a part that is relatively new in its life cycle is a hedge against early obsolescence. A further guide in predicting the potential lifetime of a part can be found in assessing the new device types and technologies being adopted by the manufacturers. It is sometimes possible, especially if large production expenditures are involved, to predict the families of parts that will be replaced by a new product line.

7.3 Implementing Proactive Approaches

In Section 1, prior to describing fundamental DMSMS processes, the following chart was used to relate a spectrum of possible DMSMS management involvement to address DMSMS risk. We again refer to the spectrum of approaches, this time focusing on proactive/higher-level DMSMS management involvement, in an attempt to mitigate or avoid DMSMS risk.

Reactive Reacting to consequences of risk.		**Proactive** The DMSMS team has a visible process of identifying, analyzing, and controlling risks that are measurable and repeatable.	
No Involvement	Low Involvement	Moderate Involvement	High Involvement
Doing nothing until the system functionality is impacted by a part that is no longer available	Focusing on the risk management process that accepts risk until being notified of a discontinuance, after-which, a contingency plan is developed and employed to preclude impact to the weapon system mission capability	Mitigating risks by actively taking steps on parts that appear to offer more risk exposure (combination of high probability and significant impact). Examples of this approach include use of hierarchical/ indentured databases describing the weapon system	Agency takes steps to avoid the risk (e.g., Use of Open Systems Architecture, Scheduled Technology Replacement, and VHDL)

Figure 7a. DMSMS Risk Management

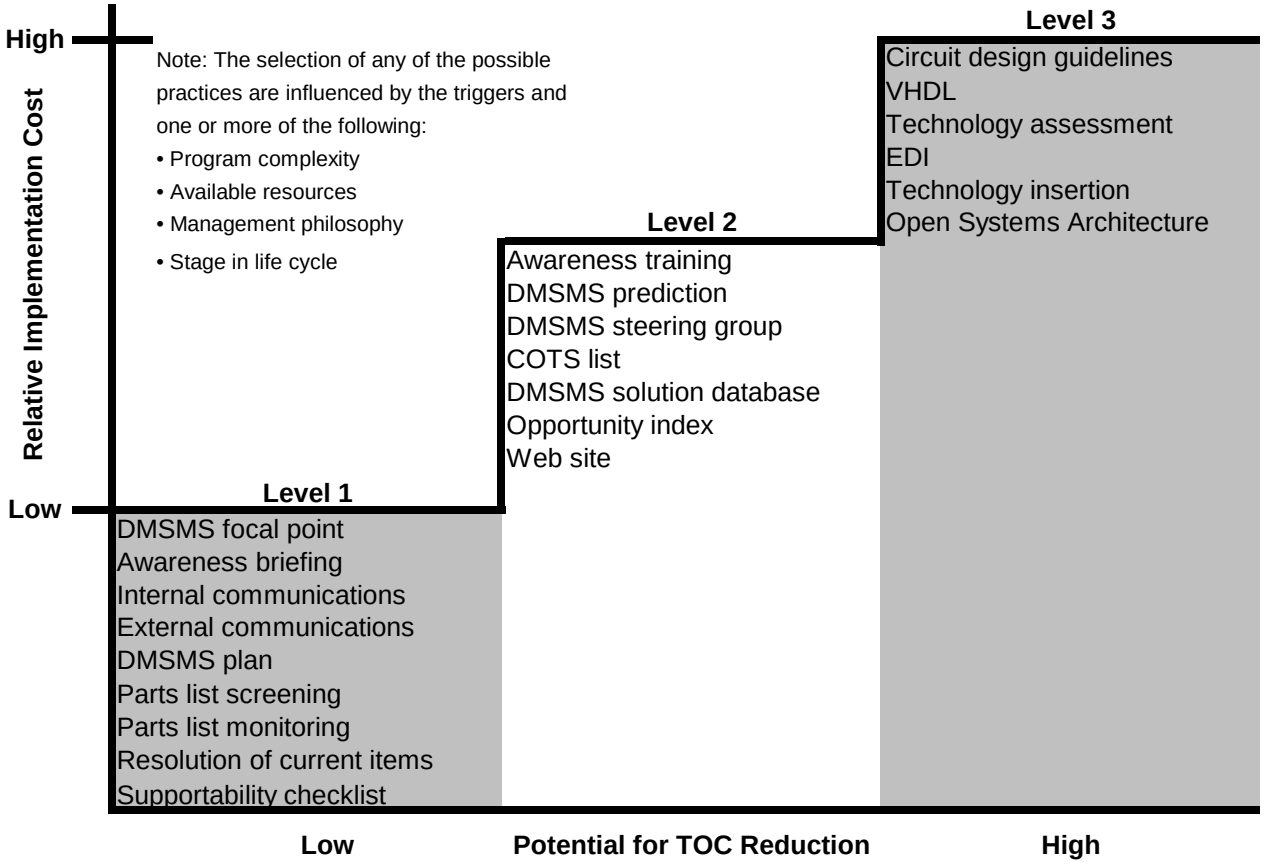
7.3.1 Implementation Intensity Levels

The DMEA "**PROGRAM MANAGERS HANDBOOK, Common Practices to Mitigate the Risk of Obsolescence"** (available at: http://www.dmea.osd.mil) calls on management to select a level of DMSMS management involvement that is appropriate for their program. The Handbook discusses three intensity levels of common practices influenced by the severity of the program's DMSMS problems and resources available to manage DMSMS. The three levels suggest practices that could be implemented to mitigate the effect of DMSMS and are defined as:

- **Level 1** – Practices are implemented to resolve current obsolete items. Some of these activities may be considered reactive.
- **Level 2** – Minimal required practices are needed to mitigate the risk of future obsolete items. The majority of these activities are perceived as proactive.
- **Level 3** – Advanced practices are required to mitigate the risk of obsolescence when there is a high opportunity to enhance supportability or reduce total cost of ownership.

These proactive activities may require additional program funding. The practices associated with these levels form the basis of a DMSMS program that can be used to mitigate the impact of DMSMS. Although an expense is associated with the implementation of a DMSMS program, cost avoidance can be realized from such a program. Figure 7b provides common implementing practices within each of the involvement levels. Further it describes these levels of involvement in relation to a relative cost of implementation versus the potential for a reduction in total operational

cost (TOC). The figure also suggests that a stimulus usually occur that convinces the program manager that one or more practices need to be implemented. These events are called *trigger*s. The Program Managers Handbook discusses these triggers indicating that the selection of the appropriate practices must also consider the complexity of the program, available resources, management philosophy, and the life-cycle phase.



Possible Triggers		
Level 1	**Level 2**	**Level 3**
Initial DMSMS awareness by program manager (PM) <10% of parts unsupportable <10 years remaining in system life cycle	Increased awareness from PM 10–20% of parts unsupportable 10–20 years remaining in system life cycle	Higher management (above PM) awareness of supportability problems >20% of parts unsupportable >20 years remaining in system life cycle Opportunity to enhance supportability or reduce total cost of ownership

Figure 7b. Stepping Up to Minimize the Risk of Obsolescence

7.3.2 Proactive AFMC efforts

Any of these planning approaches or a combination or variant of them may be appropriate for a specific situation in attempting to avoid obsolescence. In each case, the implication is that resources can be allocated to solve a problem that has not yet occurred. In a time of tight budgets, such a commitment could be difficult to obtain. **Examples of proactive AFMC efforts include**:

a. The F-15 DMSMS engineering initiative. It is widely accepted that one of the first and more robust DMSMS management programs within AFMC was started by Sam Calloway with the

F-15 Program at Warner Robins ALC. Mr. Calloway took the early lead in developing data management tools that have served as templates for other government and DMSMS industry efforts. The F-15 Product Directorate has a very active Avionics Component Obsolescence Management (AVCOM) program with the following goals:

- Pro-Active Electronic Component Obsolescence Detection
- Electronic Component Obsolescence Projection
- Integration of "Lessons Learned" and Establishment of Archival Files
- Maintain Mission Capable Aircraft (Short Term)
  - Hardware Supportability Issues
- Lifetime Platform Support (Long Term)
  - Technology Insertion

The F15 AVCOM System features intelligent partnerships with the Boeing Company, Raytheon, Ball Aerospace, Georgia Tech Research Institute, Defense Logistics Agency (DLA)/ Defense Supply Center (DSCC)/ Sarnoff Corporation (SC), and Manufacturing Technology Incorporated AVCOM Database Maintenance. In addition, the F15 SPO has formed an Obsolete Part Integrated Product Team (IPT) with participating members from SPO Program Management, Logistics, and Avionics Hardware Engineering. For more information contact : WR-ALC/LFEFA (S. Calloway), Robins AFB, GA 31098.

b. The AFRL Manufacturing Technology Initiative entitled, the **"Electronics Parts Obsolescence Initiative (EPOI)**". EPOI is a five year, $32 million Air Force ManTech Initiative that began in February 1999. The overall objective of the EPOI is to improve parts obsolescence management to ensure mission readiness and increase the fielded life of weapons systems at an affordable cost. The initiative consists of 8 programs in the following three areas: a) Commercially available obsolescence management decision and reverse engineering tools: With the specific objective to help make the most cost effective management decisions and reduce the cost of re-engineering. b) Application of Commercially Manufactured Electronics (ACME): The objective is to address key technology driven issues required to increase effective use of commercially manufactured electronics at the chip, board, and box level. This area includes efforts addressing Physics of Failure (PoF) reliability approaches and Application Specific Integrated Circuits (ASIC) availability. c) Pilot Programs: The pilot programs will establish improved business policies and obsolescence management processes utilizing the tools and technologies of the other areas. They will demonstrate and document the cost effectiveness of implementing the technology and processes into weapon systems. Workshops are held every six months. The purpose of the workshops is to strengthen and grow the existing linkages between the programs while encouraging transition of EPOI results to other organizations. For additional information, contact: Mr. Anthony Bumbalough, AFRL/MLME Wright-Patterson AFB OH 45433 or the web page at the following web site: http://www.ml.afrl.af.mil/ib/dpdsp/dmsms.htm.

c. "**A Case Study, Proactive DMSMS Management for the B-2 Weapon System**" has been written by Donna Dillahunty, B-2 DMSMS Manager and William Shaw Senior Principal Engineer, ARINC. This study demonstrates the clear benefits that are projected to greatly outweigh the cost of putting in place a DMSMS cadre. The B-2 DMSMS program was labeled as "Best Practices" by DoD and is inserted in the DoD Acquisition Handbook. The B-2 DMSMS Management Plan (DMP) has and is being emulated by several other weapon systems. This would be a good place to start if a structured Level 2 or 3 program is to be implemented. For more information contact Ms. Dillahunty at donna.dillahunty@b2mx.tinker.af.mil or Mr. Shaw at wshaw@arinc.com.

d. "***Why Are People Always Talking About VHDL"?*** is a tutorial on VHDL, written by Darrell Barker, AFRL/IFTA., to give an overall view of what VHDL is and how it works. Many decision-

makers may have heard that VHDL is important, but don't know what it is or why it should be important. VHDL is a text-based computer language that is used for the design, modeling, and simulation of digitally computing hardware. VHDL allows designers to develop a "virtual breadboard" instead of using the old technique of schematics and breadboards. This saves both time and the total cost of the design. For more information look on the DMSMS Website or contact **Darrell Barker** AFRL/IFTA, Information Directorate, Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio. The article is available at: http://www.ml.afrl.af.mil/ib/dpdsp/dmsms.htm

e. **DMEA 1999 DMSMS Cost Report.** The cost of resolving DMSMS problems is of primary concern to DoD Program Managers. DMEA is developing cost factors for various DMSMS resolutions so that DoD programs can uniformly report cost avoidance and determine cost impact of implementing a DMSMS Program. These cost factors provide the average nonrecurring engineering cost of resolving DMSMS problems. DMEA's report entitled, "Resolution Cost Factors for Diminishing Manufacturing Sources and Material Shortages" was developed by Mr. Walt Tomczykowski, ARINC and is available at the DMEA web site: http://www.dmea.osd.mil/recofac.pdf

f. **The C-17 Program Office** has taken an approach to obsolescence management that uses a support contract to address "Flexible Sustainment". Consistent with the Flexible Sustainment approach, and acquisition reform, the prime contractor has responsibility and authority to field a supportable C-17, and to minimize obsolescence by using procedures and tools selected by the contractor.

g. **Other Air Force System Program Offices** actively involved with more dedicated DMSMS initiatives include the Common Avionics (WR-ALC/LY) and Electronic Warfare Product Directorates (WR-ALC/LN) at Robins AFB, and the F-16, B-52, and Joint STARS Program Offices.

7.4 Documentation

After encountering problems on a program, the lessons learned should be documented including any warning signs that, with hindsight, preceded the problem, what approach was taken, and what the outcome was. This will not only help future acquisitions in their efforts to be proactive, but could help identify recurring problems in existing programs. The AF DMSMS Hub will add a "DMSMS Solutions" page to their web site and eventually the Shared Data Warehouse at GIDEP will host this type information. In the interim, documenting Air Force-relevant (discontinuance case) information on the GIDEP management information system, using the GIDEP form is discussed in Section 3. Although this documentation responsibility principally rests with the inventory control point/Item Manager for the part, case documentation can be submitted by anyone in the user community who is aware of the discontinued part, in an effort to stimulate broader awareness.

7.5 Open Systems Architecture: Frequently Asked Questions

{For information such as the following "frequently asked questions, visit the Open Systems Joint Task Force (OSJTF) web site at: http://www.acq.osd.mil/osjtf/.}

a. Question: What is an open system?

Answer: A system that implements sufficient open standards for interfaces, services, and supporting formats to enable properly engineered components to be utilized across a wide range of systems with minimal changes, to interoperate with other components on local and remote systems, and to interact with users in a style that facilitates portability. An open system is characterized by the following:

- well defined, widely used, preferably non-proprietary interfaces/protocols;

- use of standards which are developed/adopted by recognized standards bodies or the commercial market place;
- definition of all aspects of system interfaces to facilitate new or additional systems capabilities for a wide range of applications; and
- explicit provision for expansion or upgrading through the incorporation of additional or higher performance elements with minimal impact on the system.
- Form, fit, function, and interface (F3I) is a form of OSA used by commercial airlines for their avionics systems.

Open Systems Joint Task Force (OSJTF) 1998

b. Question: Aren't open systems products just commercial items?

Answer: NO, Commercial items (CIs) are often equated with open systems. Because of this, developments often default to CIs without adequately defining open systems interfaces. The problem is, a CI is not necessarily open. If a non-open CI product is used, unwanted vendor dependencies will likely occur.

c. Question: Does the use of commercial products force compromising requirements?

Answer: It may not always be possible to find a complete solution off the shelf. In the past, if NDI (Non-Developmental Item) was not available, then it was appropriate to develop your own. Now, technology is advancing so rapidly, that waiting for the cost of a technology to drop might be a more feasible solution. Having an open interface profile in place supports importing the appropriate cost technology at the appropriate time in a program cycle. Hence, while the initial operational capability of a system may not meet all requirements, it is likely that if the correct homework has been done in choosing the technology, improved performance may be achieved at a later time.

d. Question: Are only open standards allowed?

Answer: No, the overriding concern should be meeting application requirements in the most affordable manner, not creating the most open architecture possible. However, some suggest that since one goal of open systems is to enable the use of wide-spread products, only "wide-spread" interface standards should be considered. This is problematic because there is not an adequate way to define "wide-spread" and such a restriction would disallow emerging standards.

e. Question: Are only accredited industry standards allowed?

Answer: Some suggest that only accredited industry standards should be considered as open systems standards. Realizing that a major goal of open systems is to enable the use of wide-spread products within the domain of interest and to enable commercial leverage, such a suggestion is too restrictive. There are many widespread commercial products that are based on de facto standards or consortium standards.

f. Question: Isn't the open systems approach only applicable to software and computer systems?

Answer: Some believe open systems approaches are only applicable to computers and buses. This is not true; this approach is applicable to most complex systems. The use of open systems specifications and standards applies to both the hardware and software and to the non-digital portions of our weapons systems as well as the digital.

g. Question: Isn't the open systems approach only applicable to C3I systems?

Answer: No, the focus of the new policy is on weapons systems and platforms. While the C3I portion of the weapons platform is important for supporting the weapons platform's operation within the operational environment, the focus of the policy is on the weapons platforms intraoperability

issues to include C3I and the numerous functions necessary to support the weapons systems survivability. The weapons systems environment often places severe performance requirements (i.e., real time, fault tolerance) on the SW/HW components supporting this environment.

h. Question: Aren't using open systems specifications and standards contrary to the policy that restricts the use of detailed military specification and standards?

Answer: The Specification and Standards Reform identifies a preference for the use in solicitations of performance specifications and non-Government standards and requires a waiver for use of detailed specs and some kinds of military standards (e.g., interface standards can be used without a waiver, but a manufacturing process standard requires a waiver before it can be used in a solicitation). This Reform preference for performance specs and industry standards has the purpose of enhancing the possibility that contractors will propose specs, standards, and products that are used in the private sector. This preference paves the way for contractor proposals using industry solutions consistent with the open systems approach—i.e., widely accepted, standard products, available from multiple suppliers at competitive prices. Thus the OS approach and Standards Reform are very consistent as to purpose and effect.

i. Question: How do you select from de facto versus de jure standards?

Answer: Overall, you should select the standard that provides the best business case, whether it's de facto or de jure, and that provides your program the best chance for success over the life of the program. Market analysis is key to making the best choice (a key risk mitigation technique):

- Standards assessment criteria are used to assess the status of standards against program requirements (technical and programmatic).
- Timing is especially critical here.
- Selecting a standard that is too immature may not satisfy functional/performance requirements.
- Selecting a standard that is too mature runs the risk of being non-supportable.
- Your choices will range from standards that are "State of the Art" to "State of the Practice."
- Market analysis should be conducted throughout the program life cycle to keep program requirements in synchronization with what standards can provide.

j. Question: When is an open systems approach inappropriate?

Answer: Never—You can always take an open systems approach. However, the resulting system may only be open to the degree that the system's characteristics lend themselves to an open systems implementation. For example—

System characteristics may cause a non-open system to be the best technical and business choice, such as—

- A **highly integrated** architecture or implementation, where the architecture **lacks modularity**, or if there is modularity, the interfaces are not well defined.
- **Special or stringent system requirements**, such as real-time, fault-tolerance, multi-level security may not be supported by open systems standards. Stringent requirements may leave no room or margin to adjust requirement to match available product capabilities.
- **Short system life expectancy**, where the system may be nearing the end of its life cycle.
- **"One-of-a-kind" system**, where the system is either too unique by having very special deeply embedded technology or lacking commonality with other systems or very few copies

of the system are to be deployed. In either case, there is little opportunity for commonality or sharing among programs.

Standardizing Proprietary Specifications: While a closed or proprietary approach may be taken for reasons of costs or performance, one should consider moving this proprietary specification to be accepted as a standard.

k. Question: How does open systems facilitate technology refresh?

Answer: In the past, where technology refresh was concerned, the effects of a single technology insertion could cause a significant technical and cost ripple throughout a system. This was because changes were not isolated through a modular design. By having open commercial interface standard profiles, the insertion of better performing components using these standard interfaces alleviates the costs associated with technology insertion "ripples." The interface to external components has not changed and therefore should not cause a ripple throughout the rest of the system.

l. Question: What is meant by addressing things at an atomic or component level?

Answer: The atomic level is that level below which repairs are done by the supplier. From an open systems perspective, interfaces to components at the atomic level would be completely specified. When replacement components are necessary, the replacement components would be required to meet the open system interface specified. The specific interfaces to components within a system are called profiles of open standards, reflecting the interface features, which an atomic level component is required to support.

Some atomic level components are integrated at the network level. For example, if a sensor is integrated to the remainder of a system via a network, and the sensor were to go bad, it would be replaced with one which had a compatible interface to the open network profile, as well as compatible performance, space, weight, power consumption, and other relevant form, fit, and function factors.

In the case of a workstation, there may be many interfaces within a unit at which open repairs can take place. Using an open standard backplane, cards could be replaced with other cards that have the same functionality and that meet the backplane interface profile. Operating system interface profiles support the replacement and upgrading of operating systems with a workstation unit.

Again from an open systems perspective, the atomic level represents components that conform to the open interface profile of a system or unit and can therefore be replaced with other components meeting the open interface profile.

m. Question: When is the use of commercial item components the wrong approach?

Answer: When commercial items (CIs) are too expensive or lack in performance or functionality, or are not standards-based. Otherwise, in order to determine if the use of standards-based CIs is the wrong or right approach, the Program Manager must weigh the potential benefits against the risks.

APPENDIX A: DMSMS Resolution Alternatives: Analysis of Alternatives

This Appendix describes analysis considerations for each DMSMS resolution alternative.

ROM Cost Estimate
Calculation Definitions

The following definitions relate to Rough-Order-of-Magnitude (ROM) Estimate Calculations as described in Appendix A (Sections A-1 through A-14).

Analyst Manhours. The number of hours an analyst spent to accomplish a task.

Documentation Revision. Costs associated with changes to all documentation pertaining to the affected equipment, including but not limited to technical manuals, drawings, parts lists, schematics, test procedures, training manuals, and other support documentation. Includes labor and overhead.

Engineer Manhours. The number of hours an engineer spent to accomplish a task.

Non-Recurring Engineering. One time, up-front effort associated with research, development and design. Includes prototype manufacture, prototype testing, labor, and overhead.

Other Manhours. The number of hours spent to accomplish a task by labor categories not otherwise defined.

Part Testing (Form, Fit, Function). The testing necessary to ensure an item meets required parameters at the component, shop replaceable unit (SRU), subsystem and system levels. Includes labor and overhead.

Part(s) Removal. The cost of having a person physically remove an item from decommissioned equipment. In addition to touch labor, costs include necessary tests to ensure the functionality and performance characteristics of the component have not been jeopardized. Includes cost to capture inventory, to package, and to store.

Prototype Development. The total cost to develop and make a prototype. This includes all costs incurred, labor, and overhead.

Qualification. Verifying if a manufacturer or an item meets manufacturing or item specifications per the (QML) or (QPL). Qualification costs include all costs incurred (labor and overhead) to ensure a manufacturer complies with the specification and meets the QPL or QML criteria.

Rate. The salary an individual makes in dollars per hour including an overhead factor of 90%. No other costs are included. If an exact salary is not known, use the Step 5 salary within the grade range. Step 5 salaries with overhead included are: GS-5 $21.10; $23.52; GS-7 $26.14; GS-8 $28.95; GS-9 $31.97; GS-10 $35.22; GS-11 $38.70; GS-12 $46.37; GS-13 $55.15.

Substitution. A similar item with an acceptable number of design differences that will not degrade the performance of the equipment.

System Testing. All forms of testing necessary to ensure an item will perform within the weapon system as required. Includes labor and overhead.

Total Storage Costs. The total costs associated with storing all items from initial delivery to the day the last item is issued. Includes materiel inspection, packaging, shipping, and overhead.

Transportation. The cost to transport reclaimed items from the deactivated/decommissioned units to storage. Includes labor.

Unit Cost. The purchase price per part.

A-1 F³I, Performance Based Spec Conversion

The discipline and content of the technical documentation provides the flexibility to acquire production articles or replenishment spares through three acquisition approaches: Build-to-Print (BTP), Modified Build-to-Print (MBTP), or Form-Fit-Function-Interface (F³I). BTP reprocurement allows no variation from the original design. MBTP reprocurement allows only process changes, otherwise it provides a product equivalent to the original design. MBTP is used when the supplier has proven past performance and is thereby given flexibility to change manufacturing processes. F³I procurement/reprocurement allows a change to the original design, including new processes, but requires equivalent function and interfaces be maintained.

F³I is a mechanism to link design, fabrication, and support capability. It identifies all necessary operational, logistical, test, and interface requirements. This option may be available to the item manager for spares reprocurement. Key product performance characteristics and product acceptance criteria must be specified. F³I, especially when used with an Open Systems approach, provides flexibility to change the design while meeting performance requirements, as well as flexibility to change the manufacturing processes to produce the design. An Open Systems approach also facilitates long range modification planning across platforms, while considering the cooperative use of shared resources.

F³I presents an opportunity for the item manager to obtain lower life cycle costs for the program with no degradation to in-service support. It is imperative that the item manager and the in-service support IPT ensure that the government maintains control of the F³I configuration. This control includes sustainment of the data package (can be delegated to the contractor with government oversight), training and support equipment requirements, and repair procedures. The item manager must ensure that, if the F³I contractor defaults or elects to discontinue production or repair, the above sustainment requirements are available for either reprocurement or establishment of organic capability.

This resolution 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, commercial item descriptions, and performance nongovernment standards. Once F³I is selected as the resolution method, the specification package is provided to a contractor for production. The contractor will use commercial / industrial standard production practices to fabricate the item.

This DMSMS solution shall be utilized unless one of the following condition exists:

- F³I, 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.

If an alternative solution is required, specific justification as to its use must be documented in the case resolution documentation and given to GIDEP.

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Existing specs, design information and contractual documentation on item are obtained.

Step 3 - Evaluation of specs and contractual documentation for conversion to Performance Based Specs and item design for potential F³I solution is done. Figure A-1a lists considerations which should be factored into the evaluation:

F³I Considerations	
Support Strategy	• Consumable vs. Repairable • Source of Repair • Tech Data Requirements • Personnel Training • Test Equipment
Acquisition Strategy	• Sole Source vs. Competitive • Split Buy • Market Research
Supplier Incentives, e. g.	• Tech Insertion • Operating Time • Supply Turnaround • Long Term Contract
Configuration Management	• Version Control • Change Management

Figure A-1a. F³I Considerations

Step 4 - Schedule, Non-Recurring Cost, and Recurring Cost impacts and lasting effects of F³I solution are determined.

Step 5 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 6 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

(F^3I) Form, Fit, Function Interface

Requirements _____ x Unit Cost _____ = _____

Non Recurring Engineering = _____

Prototype Development = _____

Qualification = _____

Part Testing (Form, Fit & Function) = _____

System Testing = _____

Tech Data Compilation = _____

Documentation Revision = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-1b. F^3I ROM Cost Estimate

F³I ALTERNATIVE

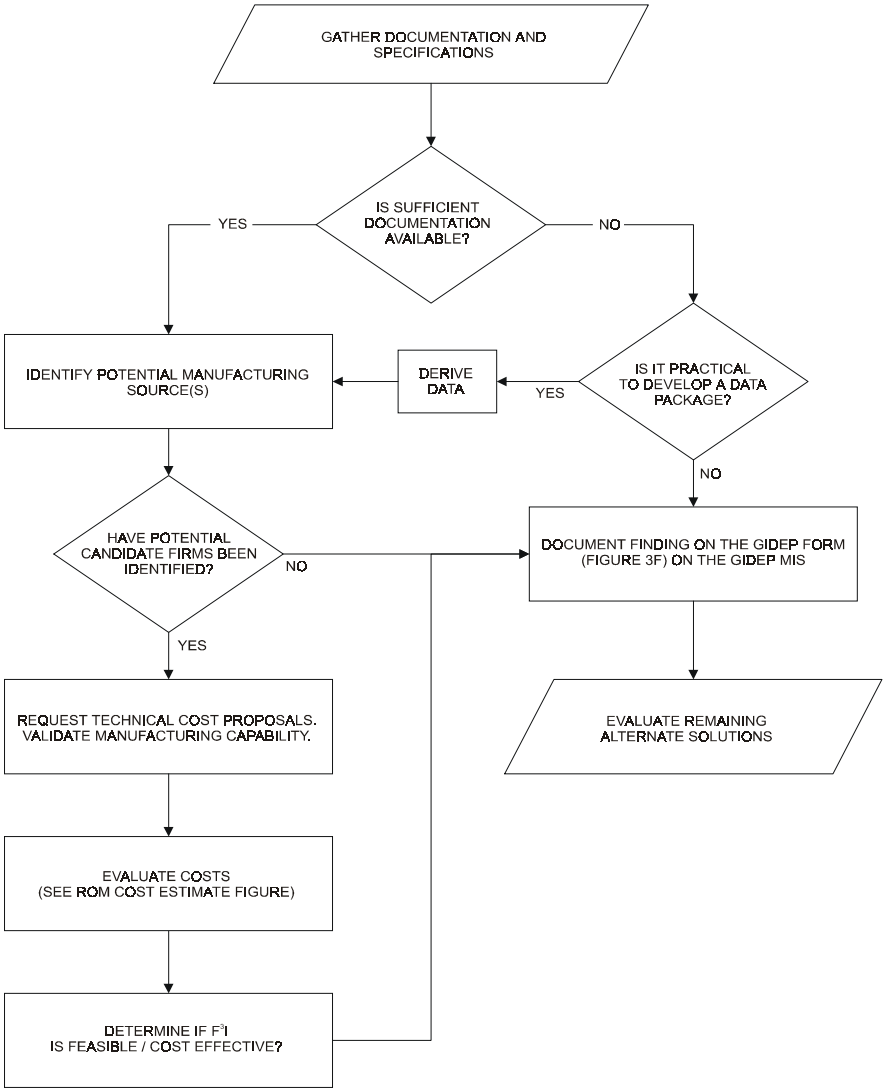


Figure A-1c. Flow chart

A-2 Encourage Existing Source

This alternative involves convincing the existing source to continue production of the DMSMS items. To determine if the existing source is willing to continue production, the manufacturing query performed as part of the *Case Verification Worksheet* is reviewed. While reviewing the worksheet, the question, *"Are there actions the government could take to encourage the manufacturer to continue to produce the item?, is evaluated."*

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Determine why manufacturer is quitting production.

Step 3 - Decide if the government could take action which would entice the manufacture to continue production.

Sample actions include:

- Price incentives
- Quantity guarantees

Step 4 - Develop schedule and cost of implementation.

Step 5 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 6 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Encourage Existing Source

Requirements (quantity guarantee) _____ x Unit Cost _____ = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-2a. Continue Existing Source ROM Cost Estimate

A-3 Alternative Source

Use this option if part specifications and test, acceptance, and related technical data are complete and available. When considering this alternative, the analyst carefully evaluates manufacturer production capabilities, tooling, test programs, etc., to ensure ability to meet original item specification requirements. The Qualified Manufacturers List (QML) Program quite often offers the best solution for high end applications. Companies have either achieved QML approval or are pursuing certification for plastic packaging and ceramic packaging which is a stable $800 million dollar business and will be available for some time to come. Upgrade testing and the use of microcircuit devices outside the data book parameters continues to be a controversial problem. DSCC has never mandated the use of QML product but has always advised the users to review the applications, life cycle costs, and logistic implications as part of the decision making process. Detailed information is available at: http://www.dscc.dla.mil/programs/qmlqpl.

The flow chart in Figure A-3a provides a summary of the alternative source resolution. In addition to or in lieu of purchasing manufacturing capability, an alternative supplier may procure wafer or chip product from the original manufacturer. Some final manufacturing steps such as specialized packaging and testing are usually required to prepare the device for application.

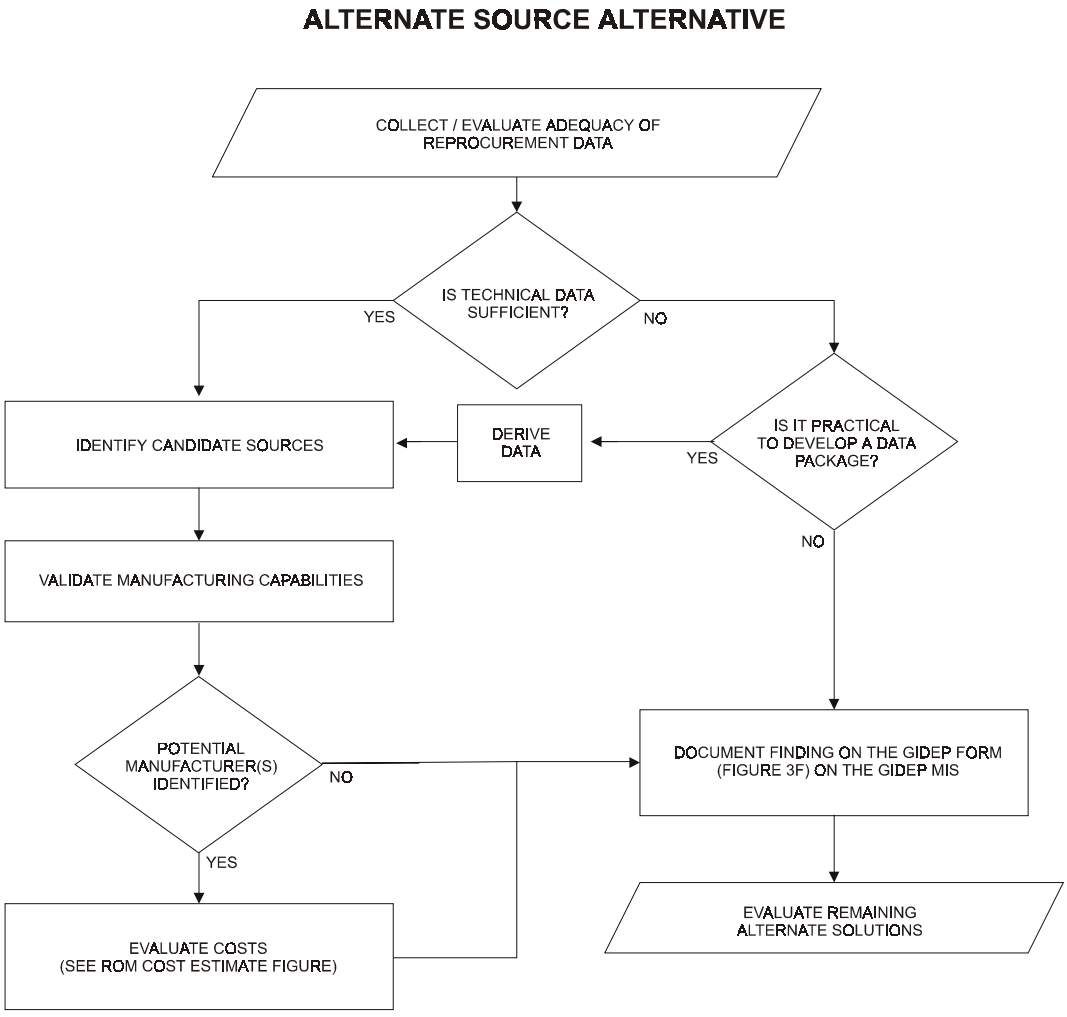


Figure A-3a. Alternative Source

It may be possible to make an extended buy from this supplier or to negotiate a long term parts supply agreement. If the wafer or chip was produced on a QML, they may be acceptable without further testing; otherwise, a test and qualification program may be necessary. Option considerations follow:

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Availability of a comprehensive procurement data package, including final acceptance test and qualification requirements for the DMSMS item is assessed. Coordination with manufacturing and engineering activities validates adequacy and accuracy of technical information. If full data is not available, cost of procuring / developing a sufficient data package to support the alternative source analysis is calculated.

Step 3 - The alternate firms are identified. Some companies distribute catalogs that identify products and technologies they support, and provide detailed cross-references to original OEM part numbers. Alternately, direct coordination with the OEMs / vendors to assist in locating suitable alternative sources may be necessary. The DMSMS Hub can provide a listing of resources to assist with this step.

Step 4 - Production capabilities are validated. Supplier capabilities must be identified to meet original item production and qualification requirements, and production plans for the expected duration of DMSMS item procurements must be assessed. To accomplish this objective, it may be necessary to provide procurement technical data, test and qualification requirements, or other information necessary to allow the alternative firms to assess their ability to manufacture F^3I replacements for the item in question. If the alternate firms are not qualified to the MILSPEC/ MILSTD/CID level of the original item specification, an engineering analysis may be appropriate to determine potential for waiving selected requirements to allow approval of the alternate part. Such actions may introduce significant technical risk in the case of DMSMS items with multiple applications, and a total system analysis that evaluates potential impact on all DMSMS item applications may be necessary. Alternately, the feasibility and cost of qualifying supplier facilities to the desired level should be evaluated.

Step 5 - Bids are requested from the alternate activities for desired quantities of DMSMS items, and determine materiel production and delivery schedules. The total future cost of the resolution, including the cost of technical data, procurement / development; source qualification, cost of the DMSMS item (including testing); documentation changes if ECP's / waivers are required and materiel handling and storage if volume procurements are anticipated are determined. A time frame for implementation of this alternative, from in-house procurement initiation through item qualification and materiel delivery is projected.

Step 6 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 7 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Alternative Source

Requirements _____ x Unit Cost _____ = _____

Nonrecurring Engineering = _____

Prototype Development = _____

Tech Data Development / Compilation = _____

Qualification = _____

Part Testing (Form, Fit & Function) = _____

System Testing = _____

Documentation Revision = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-3b. Alternative Source ROM Cost Estimate

A-4 Substitution

This alternative involves analyzing DMSMS item characteristics and attempting to locate a similar part with an acceptable degree of nonconformance. (See also A-6a Replacement with newer technology or replacement of next higher assembly.) Figure A-4a details the process for evaluating the substitution alternative. A detailed cross reference and comparison of original versus substitute part characteristics must be conducted, and an engineering deviation or waiver is generally required to support the change since it may require relaxing part specifications or performance parameters. It should be noted that cross reference methodologies may differ for mechanical / materiel versus electronic items, in part due to the availability of MILSPEC/MILSTD/CID references. For example, for electronic items the process may generally be expedited through immediate analysis of lower quality parts, or by utilizing commercially available systems that cross reference all parts. When the obsolete part is a processor the issues that must be addressed and the options available are greater than for almost any other class of part. There is usually a desire to increase memory, data storage and speed of operation. Interface requirements may change and software development may be necessary. The new processor may require a lower operating voltage that is not readily available and electromagnetic compatibility can be a subtle but important issue. Test and certification issues must be carefully considered and total hardware and software costs must be carefully evaluated.

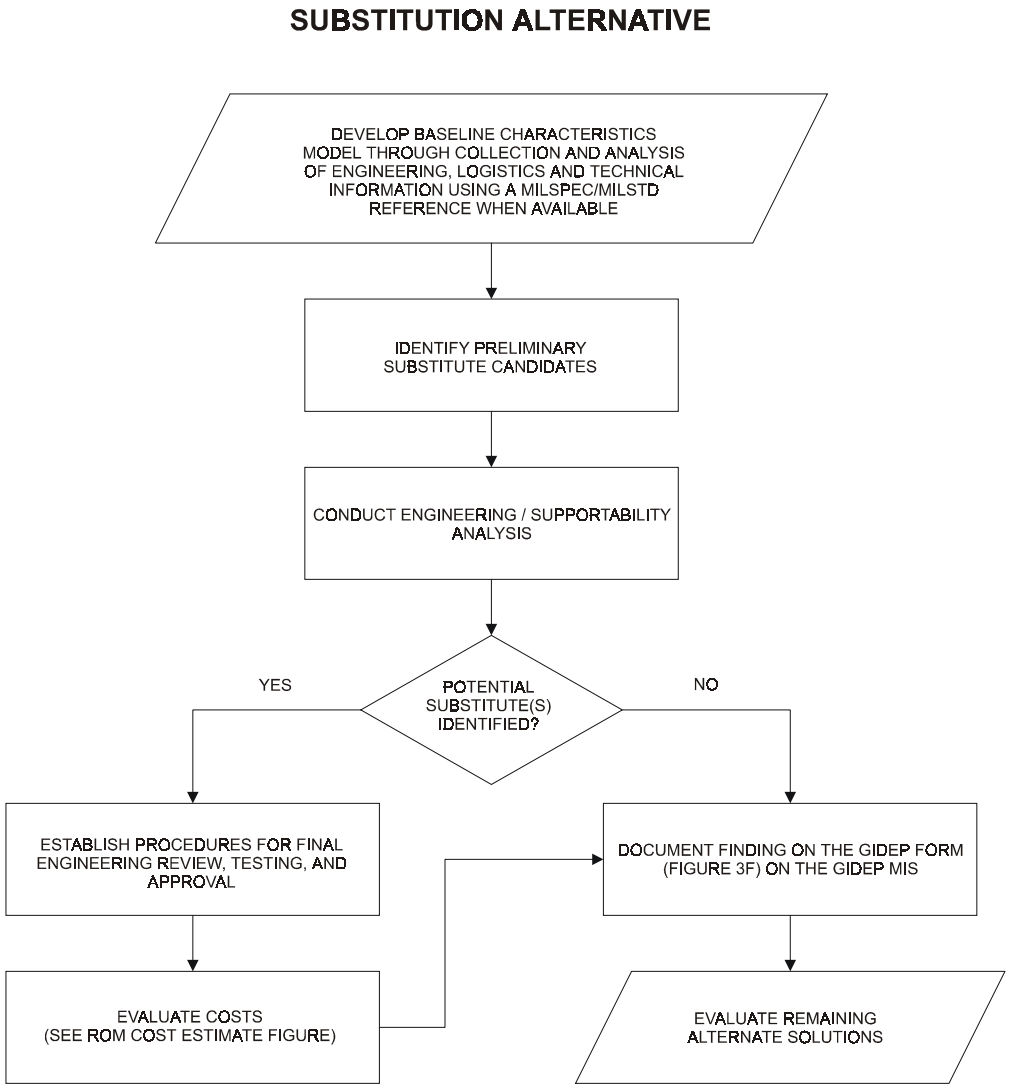


Figure A-4a. Substitution

Packaging technology is evolving along with the device technology. Coatings on semiconductor devices may provide the vapor barrier that is not provided by plastic packages and multi-chip modules make it possible to include an entire electronic system in one compact box. All new packaging concepts must undergo extensive testing but such concepts may be the preferred solution to some DMSMS cases.

All commercial-off-the-shelf (COTS) components are not equal. Most commonly, COTS are meant to be used in relatively benign environments but there are components made for relatively harsh environments that are referred to as industrial grade and Mil-Spec Grade parts for unique, harsh environments. There are ruggedized parts that have been manufactured to military specifications and COTS parts that have been ruggedized. All classes of parts should be considered when resolving a DMSMS situation.

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - A comprehensive part characteristic profile is developed through collection and analysis of engineering, logistics, and technical information (transcribe characteristic data from a MILSPEC/ MILSTD/CID reference when available). Additional information using manufacturer's documentation and other reference products available is compiled. Identification of all critical parameters and operational characteristics is necessary to allow comprehensive evaluation of substitute candidates.
Step 3 - Manufacturer and industry data sources are researched to develop a list of potential substitutes for the DMSMS item. A list of items which most closely resemble the DMSMS part is compiled. The DMSMS Hub can provide access to industry data sources, part search and identification tools to aid in completion of this step.

Step 4 - For each substitute candidate, an engineering analysis is conducted to determine whether the part matches required functionality specifications and appears to be a reasonable form and fit replacement the DMSMS item. Also evaluated is the potential for future substitute availability via manufacturer contacts and by using related analyses. The candidate list is refined as appropriate.

Step 5 - Procedures for final engineering review, testing and approval of remaining candidates are established. Detailed test plans may need to be developed involving individual item screening, as well as module, end-item and / or system drop-ins and associated integration testing. The analyst also ensures development and approval of associated engineering change, deviation or waiver packages.

Step 6 - Cost of future support for each substitute candidate and project time frames for item review, approval and availability is determined. Cost factors should include engineering analysis, source qualification requirements (as necessary), price of items (including testing), and associated engineering and logistics documentation changes.

Step 7 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 8 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Substitution

Requirements _____ x Unit Cost _____ = _____

Non-Recurring Engineering = _____

Qualification = _____

Part Testing (Form, Fit & Function) = _____

System Testing = _____

Documentation Revision = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-4b. Substitution ROM Cost Estimate

A-5 Redefine Requirement to Accept Commercial Item

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 flowchart in Figure A-5a provides a summary of the process to redefine requirements to accept commercial items. The process is similar to the substitution alternative, except you are redefining the item to accept a commercial item already available, instead of finding an item which is similar to the DMSMS item.

It is important to remember when selecting commercial-off-the-shelf (COTS) 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 part meets the needs of the military application.

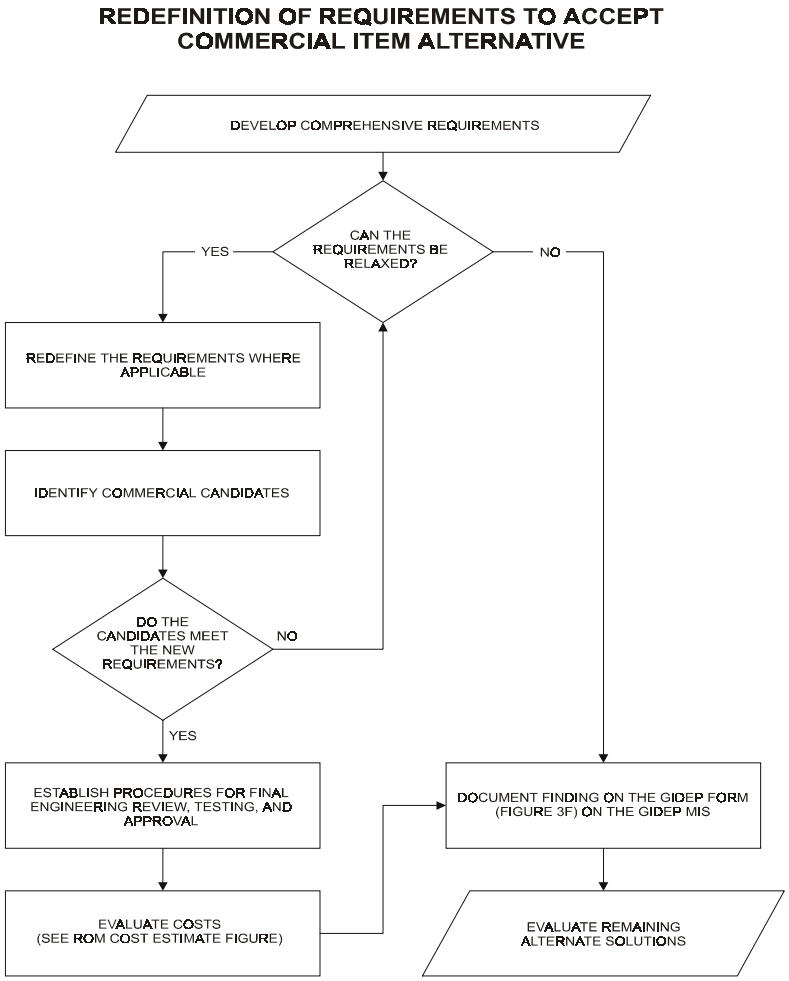


Figure A-5a. Redefine Requirement to Accept Commercial Item

MIL-HDBK-179 offers some practical advice in selecting components to meet the needs of the military.

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Comprehensive functional requirements are developed through collection and analysis of engineering, logistics, and technical data. Identification of all critical parameters and operational characteristics including power requirements is essential.

Step 3 - Manufacturer and industry data sources are recommended to develop a list of potential commercial substitutes for the DMSMS item. Characteristic data for each candidate is recorded and compared with the DMSMS item. A list of items which most closely resemble the DMSMS part is compiled.

Step 4 - For each candidate, an engineering analysis to determine whether the part matches required functionality specifications and appears to be a form and fit replacement for the DMSMS item is conducted and the candidate list is refined as appropriate.

Step 5 - Procedures must be adopted for final engineering review, testing and approval of remaining candidates. Detailed test plans may need to be developed involving module, end-item and / or system drop-ins and associated integration testing. Development and approval of associated engineering change, deviation or waiver packages is required.

Step 6 - Costs for each candidate and project time frames for item review, approval and availability are determined. Cost factors should include engineering analysis, source qualification requirements (as necessary), price of items (including testing), and associated engineering and logistics documentation changes. If the candidate item often operates at a lower voltage than the item being replaced, provisions to supply power must be part of the analysis and cost.

Step 7 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 8 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Redefine Requirement to Accept Commercial Item

Requirements _____ x Unit Cost _____ = _____

Nonrecurring Engineering = _____

Requirements Compilation / Development = _____

Tech Data Development / Compilation = _____

Source Qualification = _____

Part Testing (Form, Fit & Function) = _____

System Testing = _____

Documentation Revision = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-5b. Redefine Requirement to Accept Commercial Item ROM Cost Estimate

A-6 Emulation

Emulation is the process of developing F^3I replacements for obsolete microcircuits using state of the art materiel, design and processing techniques. The flowchart in Figure C-6a depicts the emulation process. For unavailable components; however, a risk does exist 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 and the analyst must consider this fact when developing a procurement strategy for this alternative. At the same time, the emulation process involves creation of a design library supporting wafer fabrication; therefore, if the DMSMS item is a common or previously emulated design, preliminary engineering costs may be greatly reduced. The emulation process may be conducted at the IC, circuit card, or other designated system indenture level, and is therefore often considered a subset of redesign initiatives as discussed.

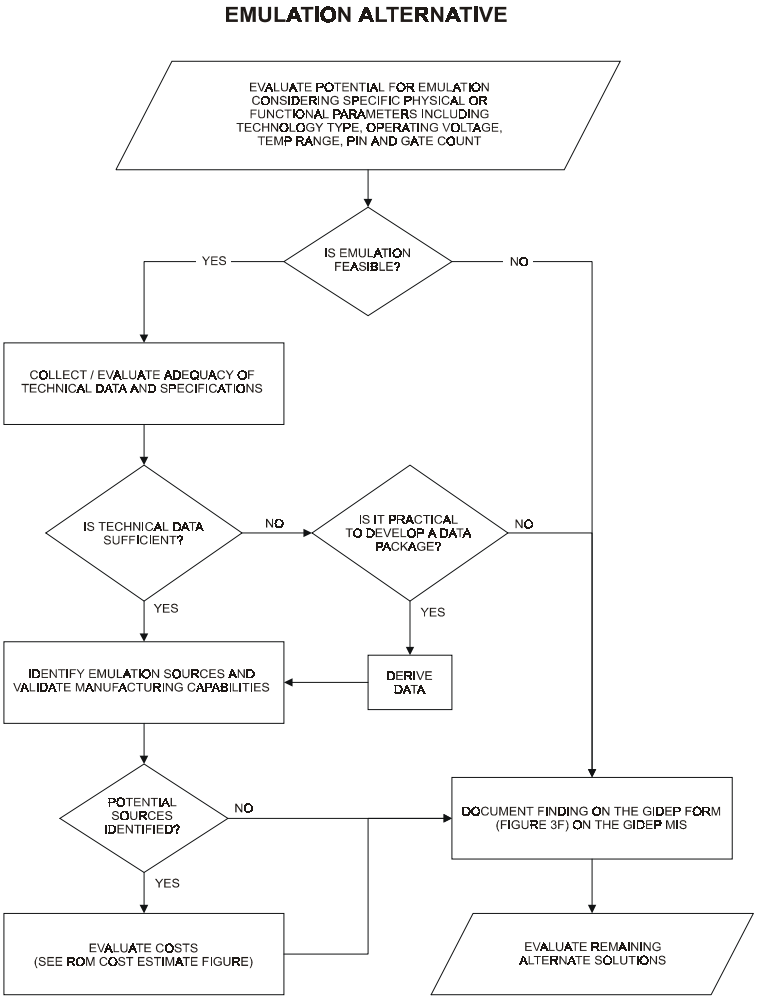


Figure A-6a. Emulation (e.g., GEM)

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Feasibility of emulating the DMSMS item is determined. Emulation is currently only possible if the microcircuit in question meets specific physical or functional characteristics with regard to: technology type (e.g. RTL DTL, NMOS, CMOS, ECL, FAST, Schottky, etc.); operating voltage; temperature range; pin and gate count; and other designated parameters. Contact with prospective emulation activities will generally quickly determine whether the part is an emulation candidate.

(Note: The AFMC DMSMS Program Office/Hub and the Generalized Emulation Microcircuit (GEM) Program Web Sites in Appendix E.)

Step 3 - Availability and adequacy of part technical data and specifications, including item testing and qualification requirements to support the emulation process are assessed. Development of an accurate and complete part specification is essential to ensure that the emulated product matches all of the characteristics of the original device. This specification should be developed from existing government and commercial documentation, as well as measurements made of existing devices to clarify questionable data. The analyst also needs to coordinate with OEMs to obtain final acceptance test procedures or other essential specification requirements. If a complete data package is not available, the analyst may wish to determine feasibility / cost of purchasing or developing the necessary technical information.

Step 4 - Candidate emulation firms are identified and provided data necessary to conduct emulation feasibility analysis (as required). Acceptability of the proposed emulation approach and associated materiel production and delivery schedules are validated. As in the aftermarket alternative, emulation firms may not maintain item qualification capabilities to the MILSPEC/MILSTD/CID level of the original item specification, and the potential for waiving specifications or funding qualification of the potential source may need to be evaluated.

Step 5 - Bids are requested from selected emulation activities for designated quantities of DMSMS items, ensuring consideration of varying order quantities to support volume price breaks. Total cost of this alternative, including: technical data / specification development; source qualification; LOT DMSMS materiel; item test / acceptance costs (including module / end-item drop-ins and full system integration testing as required); engineering / logistics data revisions; and materiel handling / storage (if volume procurements are anticipated) are developed. Time required for completion of the emulation process, including in-house lead times and engineering change package analysis and approval is projected.

Step 6 - The final design is documented (e.g., in the VHDL/VDELE format) so that future replacement or redesign will be expedited.

Step 7 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 8 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Emulation (e.g., GEM)

Requirements _____ x Unit Cost _____ = _____

Non-Recurring Engineering = _____

Tech Data Development / Compilation = _____

Qualification = _____

Part Testing (Form, Fit & Function) = _____

System Testing = _____

Documentation Revision = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-6b. Emulation (e.g., GEM) ROM Cost Estimate

A-7 Life-of-Type (LOT) / Bridge Buy

This alternative involves purchasing a supply of DMSMS items to support total demands of the impacted systems / equipment for the projected service life (LOT Buy) or until another resolution can be implemented (Bridge Buy). WR-ALC/LFEFA has developed the following Life Time Buy Calculation which is a part of their analysis efforts.

Life Time Buy Calculation

$$LTB - U_F R_D L_P - (I_{OH} + I_{DI})$$

where LTB = Life Time Buy Quantity

U_F = Uncertainty Factor

R_D = Historical Rate of Demand

L_P = Projected Remaining Life

I_{OH} = Inventory On Hand

I_{DI} = Inventory Due In

The flow chart in Figure A-7a provides a summary of the LOT / Bridge Buy Process. General LOT / Bridge Buy policy can be found in AFMCMAN 23-1, Chapter 29. The standard formula can be found in AFMCI 23-106. Per AFMCMAN 23-1, Chapter 29, AFMC Form 614 can be used to do the calculations.

LIFE-OF-TYPE (LOT) / BRIDGE BUY ALTERNATIVE

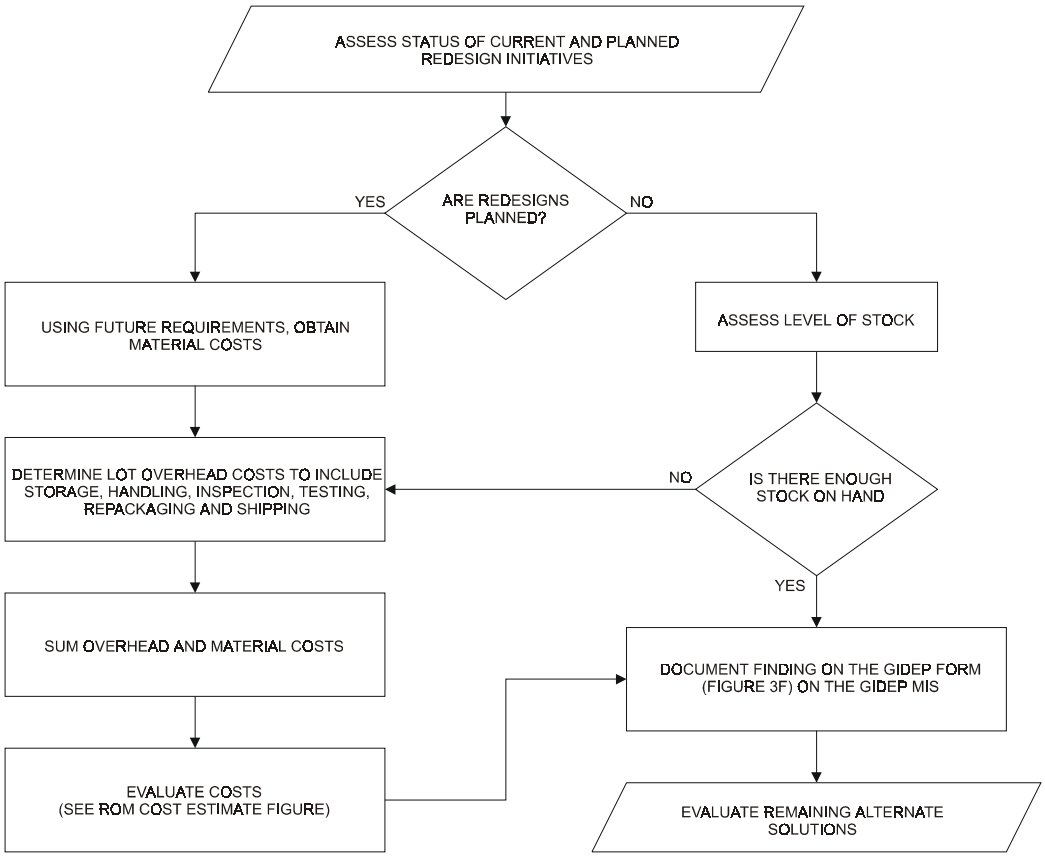


Figure A-7a. Life of Type (LOT) / Bridge Buy

It should be noted that LOT / Bridge purchases are not necessarily limited to DMSMS items. For example, in the case of microcircuits, the only available option may be the purchase of LOT / Bridge quantities of die, which would require additional fabrication steps prior to use. Similarly, the LOT / Bridge Buy option may involve purchase of items or materiel essential to continued production or

repair of the DMSMS item. LOT / Bridge Buys have traditionally been a common resolution alternative, but are no longer routinely preferred due to the difficulty in accurately predicting lifetime demand requirements.

LOT / Bridge Buy calculations can be recorded on the Future Requirements Analysis Worksheet. Upon completing analysis of each resolution alternative, pertinent data should be summarized on the DMSMS Case Resolution Worksheet. If a LOT / Bridge Buy is performed, additional information must be documented due to Congressional interest in this method of case resolution and because of legal limitations on the acquisition of excess supplies. Title 10 U.S.C., Chapter 131, Section 2213, limits acquisition of supplies to not exceed two years supply including on-hand inventory. There is an exception to the two year limit; the "activity head" may certify in writing that the acquisition is necessary for the purpose of maintaining the industrial base or for other reasons of national security. This documentation, along with the following must be maintained with the case file.

- Weapon system applicability
- Dollar value and quantity
- Computation used for quantity determination
- Location where assets are being stored and identification of offices that can draw upon these assets
- Types of materiel (e.g., microcircuits, vacuum tubes, capacitors, etc.)
- Copies of the review authorization process paperwork associated with the LOT / Bridge Buy

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Total materiel cost for the LOT / Bridge Buy is projected and can be recorded in LOT / Bridge Materiel Cost of the LOT / Bridge analysis worksheet. This calculation may be obtained by requesting a quote from the manufacturing sources based on the total LOT / Bridge quantity (it should be noted that sources may include aftermarket manufacturers or emulation activities). If a quote is unavailable, obtain the current unit price for the DMSMS item and multiply by the LOT / Bridge quantity. Item testing requirements and all other cost factors must be considered.

Step 3 - LOT / Bridge Buy overhead costs are calculated and can be recorded on Total LOT / Bridge cost area of Future Requirements Analysis Worksheet. This figure should include storage and handling requirements for the DMSMS item for the anticipated life of service, and the cost calculation should be indexed as necessary for both inflation and the effects of a declining item population due to drawdown.

- Storage requirements: Determine total storage space needed, identifying any unique environmental requirements, and project cost.
- Handling requirements: Determine requirements for inspection, depackaging, test, re-packaging, and shipment of DMSMS items, and any additional materiel management actions required to maintain item readiness.

Step 4 - Total LOT / Bridge Buy cost (materiel plus overhead) are calculated and recorded in the Total LOT / Bridge Cost area of the Future Requirements Analysis Worksheet. Also, LOT / Bridge Buy execution time frame is determined, from the commencement through materiel delivery.

Step 5 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 6 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Life of Type Buy (Lifetime Buy, Last Time Buy, Extended Buy)

Requirements _____ x Unit Cost _____ = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-7b. Life of Type (LOT) Buy ROM Cost Estimate

A-8 Develop New Source

Development of new sources (either government and commercial organizations) for DMSMS items may be considered when a full reprocurement technical data package is owned or may be purchased by the government. Emulation or Aftermarket Manufacturers options should be evaluated prior to assessing this option.

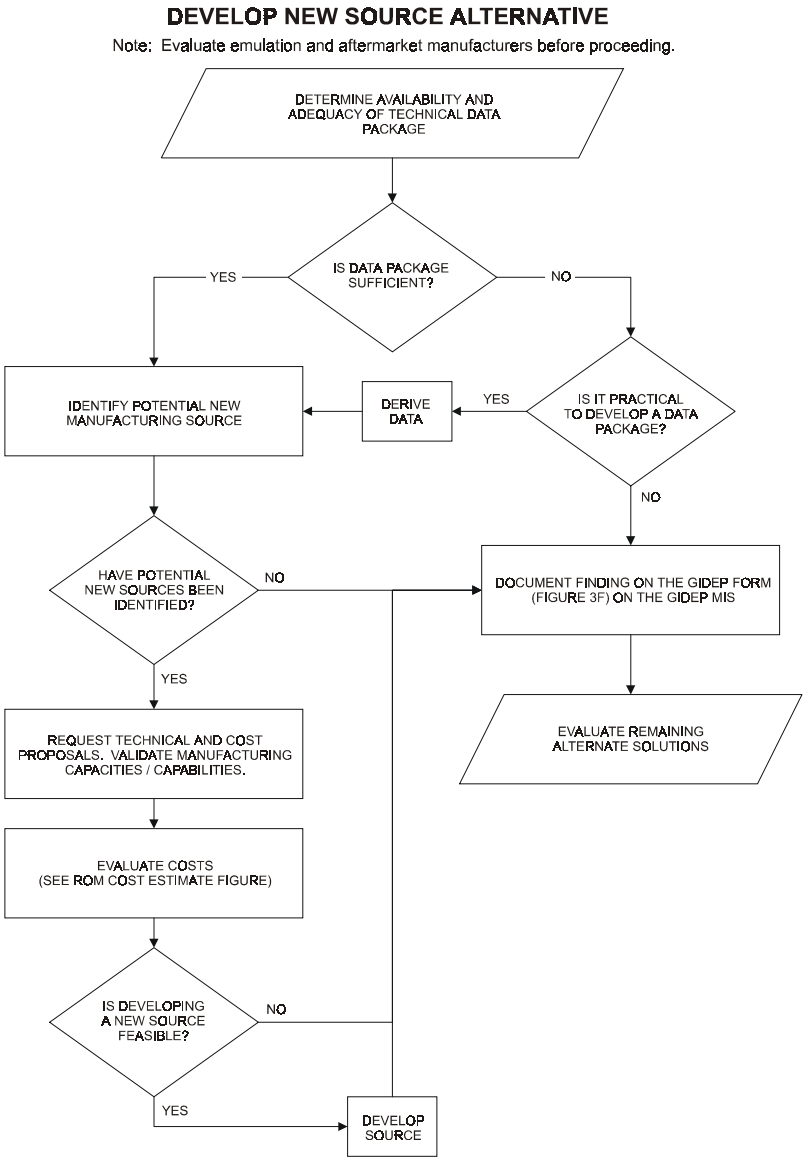


Figure A-8a. Develop New Source

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Availability and adequacy of DMSMS item technical data package to support source setup and manufacturing / testing requirements are assessed. If the data is not currently owned by government, then the analyst will need to determine the cost and schedules for data acquisition.

Step 3 - Alternate manufacturing sources are identified and a letter of interest from leading manufacturers is solicited to assist in identifying candidates. The in-house capabilities of government manufacturing programs as well as commercial sources are also assessed.

Step 4 - Technical data, drawings and any other information necessary to support manufacturer feasibility, production and cost analyses are provided to selected manufacturing users. Technical / cost proposals, and production and delivery schedules for manufactured items are requested.

Step 5 - Costs for this alternative, including technical data acquisition / enhancement, source setup and qualification and future materiel requirements are calculated. An implementation time frame is estimated.

Step 6 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 7 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Develop New Source

Requirements _____ x Unit Cost _____ = _____

Nonrecurring Engineering = _____

Tech Data Development / Compilation = _____

Source Qualification = _____

Prototype Development = _____

Part Testing (Form, Fit & Function) = _____

System Testing = _____

Documentation Revision = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-8b. Develop New Source ROM Cost Estimate

A-9 Reclamation

This will be 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) equipment at government depot repair facilities, government / commercial surplus and stored materiel that has been removed due to modernization programs, and items resident within deactivated or decommissioned units.

The Aerospace Maintenance and Regeneration Center (AMARC) is DoD's single manager for aerospace assets in extended storage. Reclamations usually are made at the LRU level but piece parts may be available.

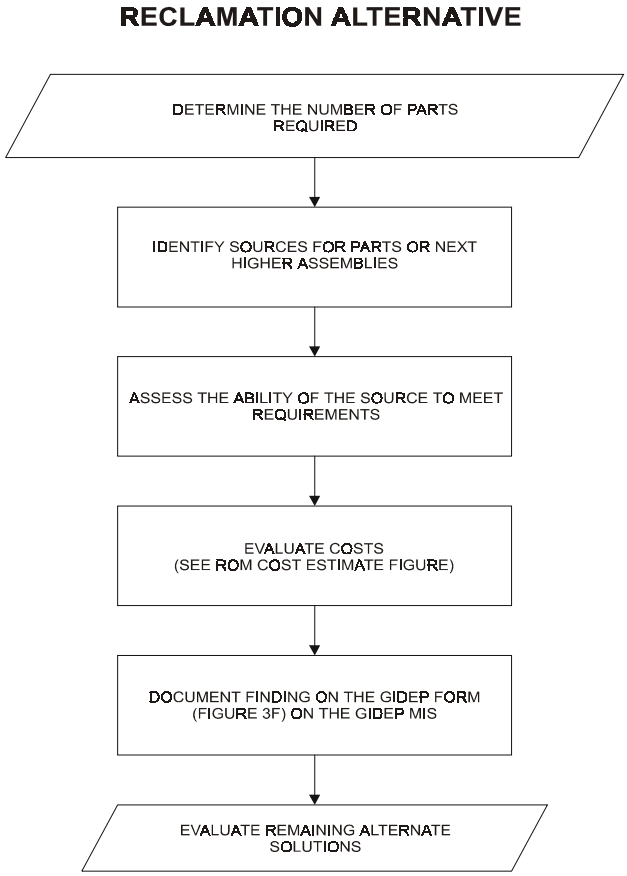


Figure A-9a. Reclamation (Decom, Cannibalization)

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Availability of DMSMS items in surplus, obsolete and out-of-service systems is assessed. If the analyst does not have preliminary knowledge of a potential reclamation source, this information may be evaluated via:

- Contact with AMARC.
- Coordination with depot repair and storage facilities known to be repositories of BER or surplus materiel.
- Coordination with ICP of Air Force, DLA activities or other DoD supply and logistics organizations.
- Coordination with commercial surplus and materiel organizations.

Once candidate systems or end-items are identified, the DMSMS analyst also establishes coordination with cognizant system sponsors as necessary to initiate the reclamation approval process.

Step 3 - The usable population of DMSMS parts within out-of-service systems is calculated. This number should then be adjusted to reflect the percentage of reclaimed parts which can be expected to fail acceptance testing due to damaged sustained during removal, shipping, depackaging, testing, repackaging and storage (the analyst may coordinate with reclamation and engineering activities to determine the appropriate level of this adjustment). Usable population projections are compared with the final DMSMS item future requirements. If the reclamation option will satisfy future projections, or is required to resolve a crisis situation or required to serve as an interim resolution measure, continue with step 4.

Step 4 - Cost for the reclamation alternative is calculated. This may involve requesting a letter of interest from OEMs or cognizant government depot activities to determine cost for:

- Transportation of end items to a designated facility for performance of reclamation and testing.
- The physical reclamation process, where cannibalization or end-item disassembly is required.
- Depackaging, testing and repackaging of DMSMS items.
- Storage, handling and shipping of DMSMS materiel.

Step 5 - Calculate total costs and develop a schedule for completion of the reclamation process, including lead times for support and industrial activities performing the reclamation work are documented. The analyst also maintains coordination with system sponsors as necessary to expedite final approval of the reclamation process.

Step 6 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 7 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Reclamation (Decom, Cannibalization)

Requirements _____ x Unit Cost _____ = _____

Part(s) Removal: Manhours _____ x Rate _____ = _____

Transportation = _____

Part Testing (Form, Fit & Function) = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-9b. Reclamation (Decom, Cannibalization) ROM Cost Estimate

A-10 Redesign

This alternative involves designing out DMSMS items via engineering changes at various system indenture levels, with goals of enhancing system performance and improving reliability and maintainability. The flowchart in Figure A-10a provides an overview of the redesign process. An increasingly common type of redesign, known as technology insertion, 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 line replaceable unit (LRU) level 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.

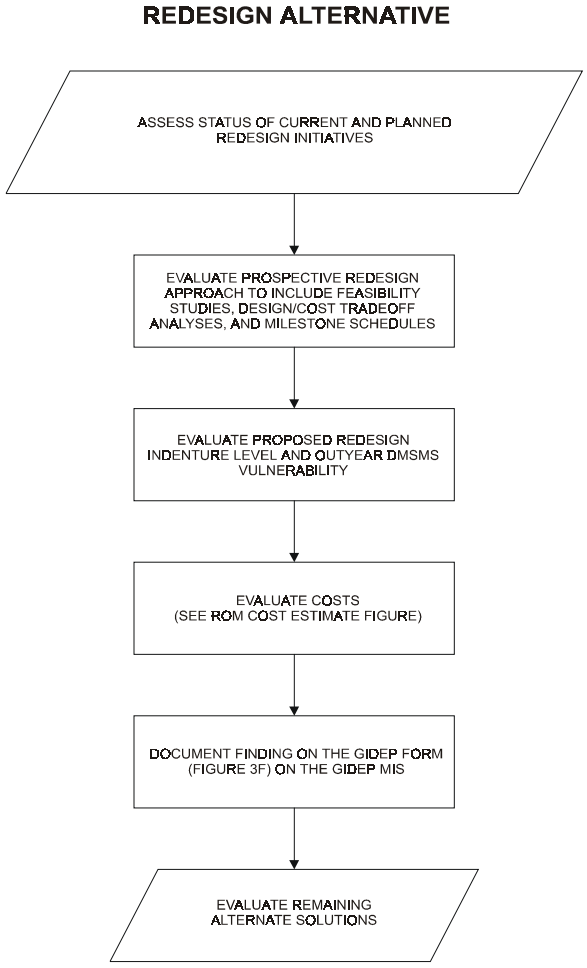


Figure A-10a. Redesign

Reduction in number and variety of parts is increasingly a goal in redesign efforts. Future DMSMS problems are lessened and inventory costs are reduced through parts reduction. MIL-HDBK-512 provides information in parts program management and standardization.

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Status of current planned redesign initiatives are assessed for affected systems / equipment, and request associated technical and cost proposals are requested. OEMs and part manu-

facturers may have programmed redesign efforts or may have conducted research to support DMSMS problem resolution or may have related redesign efforts for other reasons.

Step 3 - Redesign engineering and cost proposals are reviewed and approved, as are development of feasibility studies, design and cost trade-off analyses, milestone charts, and any other information necessary to validate schedule, technical and financial aspects of the redesign approach. The design should be documented in VHDL (mainly digital devices at this time).

Step 4 - Proposed redesign indenture level and outyear DMSMS vulnerability is evaluated. With regard to the first objective, analysis of both existing and potential DMSMS problems on a total system, equipment or end-item basis may be necessary to determine the most efficient indenture level for redesign efforts. Design changes should be initiated on a sufficiently broad scale to minimize continued piece part DMSMS impacts. At the same time, parts and materials used in the final engineering change package should be screened to determine outyear DMSMS risk.

Step 5 - Cost projections for this alternative are developed including up-front system engineering, testing, procurement and installation, as well as technical data development / modification and additional life cycle logistics support costs (both manpower and materiel). A number of logistics cost estimating models, which provide life cycle cost factors for equipment engineering changes and alterations, are available to assist in this analysis. Time required for completion of the redesign process and record projected cost and execution time frames is identified.

Step 6 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 7 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Redesign

Requirements _____ x Unit Cost _____ = _____

Non Recurring Engineering = _____

Prototype Development = _____

Qualification = _____

Part Testing (Form, Fit & Function) = _____

System Testing = _____

Documentation Revision = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-10b. Redesign ROM Cost Estimate

A-11 Replacement

Replacing an obsolete or discontinued item often can extend a NHA's life 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 replacement of a higher assembly are two common replacement options. *Note:* Replacement of a higher assembly is not limited to the next higher assembly. For example, an entire radar unit may be replaced with a newer, more enhanced one rather than continuing to replace board or part level discontinued items on the original radar unit.

A-11.1 Replacement with Newer Technology

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.

A review of the specifications should be done to ensure obstacles to use of the new technology are not artificial - created by the limits of technology available at the time. Enhanced performance may be achievable through exercising this alternative. This option is discussed within a variety of other resolution alternatives but it is repeated here to highlight it as a viable alternative.

A-11.2 Replacement of Next Higher Assembly

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, replacement at the board level many be a better option than replacement of an individual chip.

A-11.3 Replacement with an Equivalent Part

As the functionality of integrated circuits increases and as the cost of a particular item decreases with usage, it may become advisable to use a replacement part with functionality beyond that of the original component. This is very likely to be true for microprocessors. If the candidate replacement part meets form, fit and function requirements; does not reduce reliability and is cost effective, it should be used.

A-12 Contractor Maintained Inventory

This resolution would require the contractor, through contractual 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 contractor is maintaining the inventory, not the government.

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Total materiel cost for the requirement is projected and recorded on the future analysis worksheet. This data may be obtained by requesting a quote from the manufacturing sources based on the total quantity (it should be noted that sources may include aftermarket manufacturers or emulation activities). Item testing requirements and all other cost factors are considered.

Step 3 - Total overhead costs for the contractor (who maintains the inventory) are calculated and recorded on Total Cost area of *Future Analysis Worksheet*. This figure should include storage and handling requirements for the DMSMS item for the anticipated life of service, and the cost calculation should be indexed as necessary for both inflation and the effects of a declining item population due to draw-down.

- Storage requirements: Identify any unique environmental requirements, and then develop a cost projection for an appropriate facility.
- Handling requirements: For inspection, unpackaging, test, repackaging, and shipment of DMSMS items, and for any additional materiel management actions required to maintain item readiness are assessed.

Step 4 - Total cost (materiel plus overhead) are summed and recorded in Total Cost area of *Future Analysis Worksheet*. Also, LOT buy execution schedule, from the initiation of procurement action and including procurement lead-time prior to contract award is determined.

Step 5 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 6 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Contractor Maintained Inventory / Excess Assets Source / Contractor Assets

Requirements _____ x Unit Cost _____ = _____

Transportation = _____

Documentation Revision = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-12a. Excess Assets Source (Contractor Assets) ROM Cost Estimate

A-13 Production Warranty

This resolution would require the contractor to supply the item or items for a specified time (life of equipment) irrespective of demands. This alternative is similar to contractor maintained inventory, except that the quantity is not defined, only the contract duration.

Step 1 - Throughout the following analysis, relevant data is collected on a worksheet applicable to your needs. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - The cost of this approach may be obtained by requesting a quote from the contractor.

Step 3 - The quote is recorded and a LOT execution schedule, including procurement lead-time prior to contract award is developed.

Step 4 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 5 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

A-14 Reverse Engineering (RE)

Reverse engineering is the process of developing exact replicas of items through review of available technical data, testing, physical disassembly and inspection and analysis of functions performed by the item in the application. RE may be appropriate when the government does not possess sufficient technical data or data rights to support reprocurement. One goal is to cultivate qualified alternate sources and to 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 resolutions. For an overview of the RE process, refer to the flowchart in Figure A-14a.

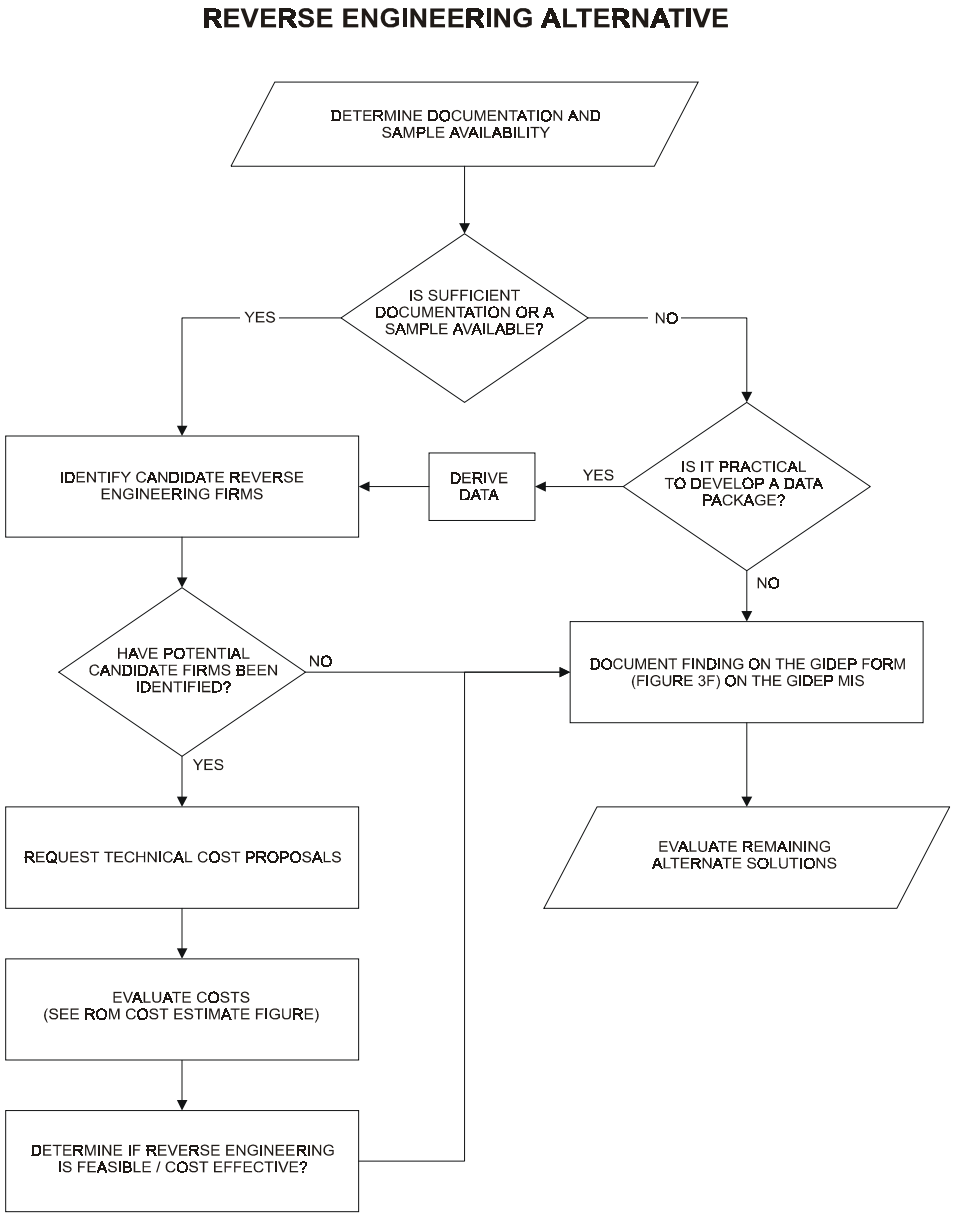


Figure A-14a. Reverse Engineering (RE)

Step 1 - Throughout the following analysis, relevant data is collected on an applicable worksheet. Appendix G provides examples of typical DMSMS resolution analysis worksheets.

Step 2 - Assess available item technical and procurement data, and determine the availability of sample items for analysis and disassembly during the RE process is collected.

Step 3 - Industrial or government concerns with the prospect of reverse engineering the part in question and with making sample items available are identified. The DMSMS Hub can provide lists of potential commercial manufacturers and government facilities. Availability of historical contract information and technical data is determined. Feasibility analysis, technical / cost proposals, and completion schedules are requested. Ensure that plans include product improvement or redesign initiatives as part of the RE process and that adequate documentation is provided. RE proposals are evaluated for feasibility, technical merit and schedule conformance.

Step 4 - Costs for the RE alternative, including: RE feasibility analyses and studies; source setup and tooling (as required); prototype production; reprocurement data package development, review and approval; materiel; and additional life cycle logistics manpower / materiel costs resulting from redesign or product improvement initiatives are developed.

Step 5 - Alternatives are evaluated and the best resolution (or mix) is selected and implemented.

Step 6 - Results are documented on the GIDEP form (Figure 3f) on the GIDEP MIS.

ROM Cost Estimate

Reverse Engineering

Requirements _____ x Unit Cost _____ = _____

Non Recurring Engineering = _____

Tech Data Development / Compilation = _____

Source Setup and Tooling = _____

Prototype Development = _____

Qualification = _____

Part Testing (Form, Fit & Function) = _____

System Testing = _____

Documentation Revision = _____

Warehousing & Disbursement = _____

DMSMS Analysis Labor:

Engineer Manhours _____ x Rate _____ = _____

Analyst Manhours _____ x Rate _____ = _____

Other Manhours _____ x Rate _____ = _____

Solution Total = _____

See Appendix A (2nd page) for terms clarification.

Figure A-14b. Reverse Engineering ROM Cost Estimate

APPENDIX B:

Defense Priorities & Allocations System (DPAS)

What Is DPAS?

The Defense Priorities and Allocations System (DPAS) was established to assure the timely availability of industrial resources to meet national defense requirements and provide a framework for rapidly expanding industrial resources in a national emergency.

DPAS is authorized under Title I of the Defense Production Act of 1950, as amended, in which the President is empowered:

(1) to require the priority performance of contracts and orders necessary to promote national defense, and

(2) to allocate materials and facilities as necessary to promote national defense.

The responsibility to implement DPAS funnels down from

the President through the

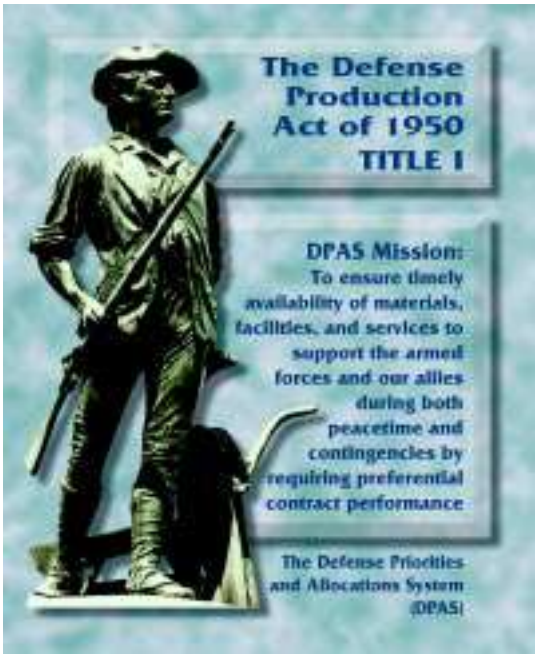
Federal Emergency Management Agency (FEMA)
Advisor to the National Security Council on security resource preparedness; provides central coordination and procedures for conflict resolution between the Federal departments and agencies;

through the

Department of Commerce
Who coordinates, administers, and enforces DPAS with respect to industrial resources;

to the

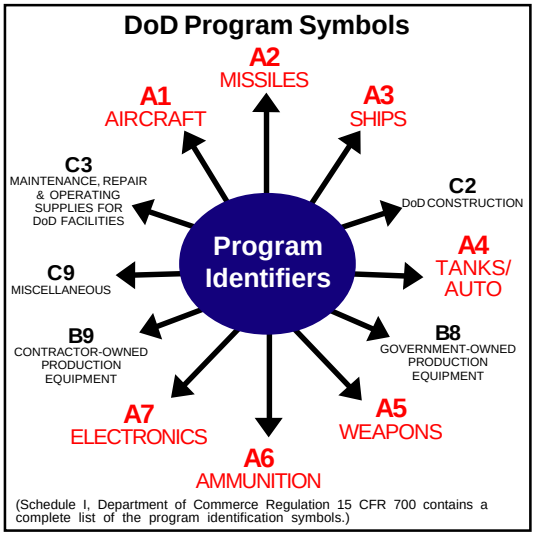
Delegated Agencies (e.g., DoD, Energy, Transportation)



What Is A Priority Rating?

All prime contracts, subcontracts, or purchase orders in support of an authorized program are given a priority rating.

Priority Rating = Rating Symbol + Program Identifier



- Rating Symbol
  - — A **DX** rating is assigned to those programs of the highest national priority.
  - — A **DO** rating is assigned to those programs that are vital to national defense.
  - — An unrated order is a commercial order or a DoD order that is not ratable.

A DX rating takes priority over a DO rating which takes priority over an unrated order.

- Program Identifier

Each authorized program is assigned a program identifier symbol. The program identifier symbol does not, by itself, indicate any priority.

Where Is A Priority Rating Used?

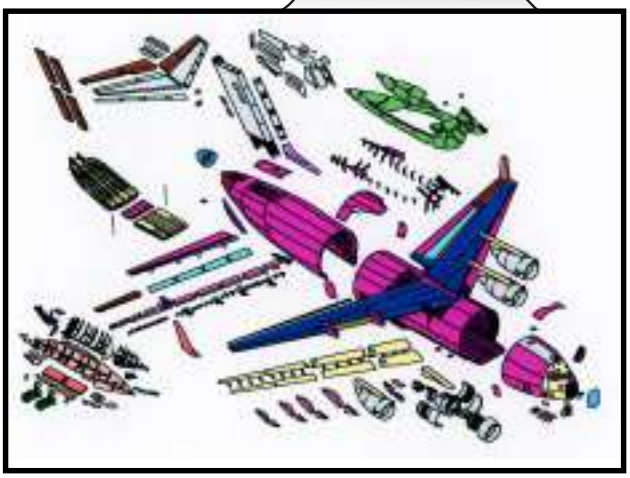
The DPAS rating is assigned to all military items used in support of national defense, from the largest finished platform to the smallest component. It can be applied to all stages of acquisition research and development, initial design, production and testing, delivery, and logistics support.

Items not ratable are:

- **Communication services**
- **Fuel/electric power**
- **Transportation resources**

What Are The Elements Of A Rated Order?

Rated orders must be submitted in writing or electronically. Each rated order must include:



(1) Appropriate priority rating

(2) Specific delivery date

(3) Signature of an individual authorized to sign rated orders

(4) Statement certifying rated order.

"This is a rated order for national defense use, and you are required to follow all the provisions of the Defense Priorities and Allocations System Regulations (15 CFR 700)."

What Provisions Govern DPAS Rated Orders?

There are four basic provisions for DPAS:

(1) Mandatory Acceptance (Department of Commerce Regulation 15 CFR 700.13(a))

- A rated order must be accepted by a contractor, subcontractor, or supplier when:
  - they make the item
  - normal terms of sale apply
  - they can meet delivery dates required by contract

Exceptions are found in Department of Commerce Regulation 15 CFR 700.13(b).

(2) Mandatory Extension
(Department of Commerce Regulation 15 CFR 700.15)

- Contractors are responsible for extending the received rating to their suppliers to obtain items needed to fill rated orders or to obtain replacements of inventoried items.

(3) Priority Scheduling
(Department of Commerce Regulation 15 CFR 700.14)

- Operations, including the acquisition of all needed production items, must be scheduled to satisfy the delivery requirements of each rated order.

(4) Customer Notification Requirements
(Department of Commerce Regulation 15 CFR 700.13(d))

- A rated order must be accepted or rejected, in writing, within fifteen (15) working days for DO rated orders and ten (10) days for DX rated orders.

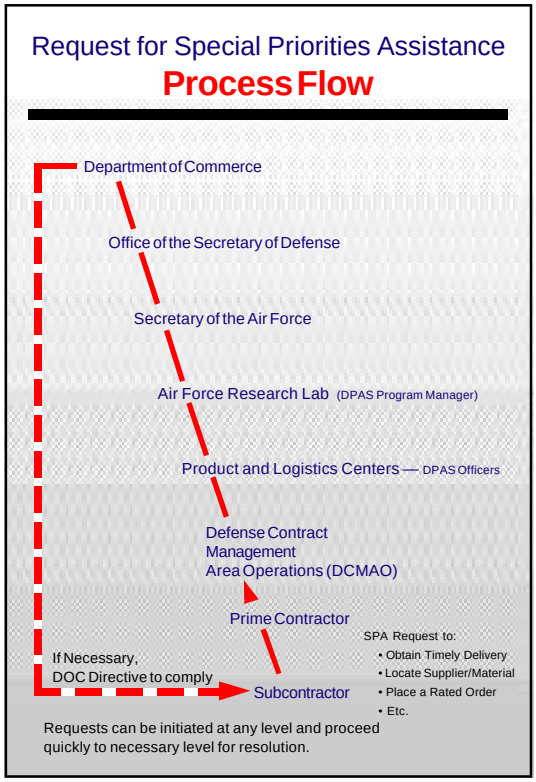
What Is Special Priorities Assistance?

The DPAS is meant to be largely "self-executing", in that the basics are provided in the rated order thereby allowing use of the system without a great deal of interaction being required by a central office. However, production or delivery problems may arise that require additional assistance. Within the Air Force, there is a small infrastructure of full or part-time DPAS representatives available to help. Any activity along the acquisition or production chain, from the user to the buying activity, to the customer, to the prime contractor or the sub-tier contractor can initiate a Special Priorities Assistance (SPA) request.

When Can I Use Special Priorities Assistance?

Program/Logistics Managers can utilize special priorities assistance to:

- **Expedite deliveries of rated orders**
- **Resolve delivery conflicts between rated orders**
- **Assist in placing rated orders with suppliers**
- **Locate suppliers to fill a rated order**
- **Verify urgency of rated orders**
- **Rate items not automatically ratable**
- **Ensure compliance with the DPAS.**



How Do I Receive Special Priorities Assistance?

To request Special Priorities Assistance, Program/ Logistics Managers must submit Form BXA-999 through the local contract administration representative or local DPAS Officer (DPASO) to the Air Force DPAS Program Office. To request a priority rating authority for production or construction equipment, a Form DD-691 must be submitted through the local contract administration representative to the DPAS Officer for signature. Form BXA-999 (or DD-691) may be obtained from your local DPASO or the Air Force DPAS Program Office.

Points of Contact (POC) are available at the following facilities to provide assistance and additional information about the Defense Priorities and Allocations System:

Points of Contact:

Air Force DPAS Program Manager:

Mr. James A. Neely, AFRL/MLME

Wright-Patterson AFB, OH 45433
DSN: 674-4374 Com'l: (937) 904-4374

Gerald (Jerry) Elmers, AFRL/MLME

Wright-Patterson AFB, OH 45433
DSN: 785-3255 Com'l: 255-3255

Local DPAS Officer:

Contact information for AFMC Product and Logistics Centers can be obtained from:
- The above-listed manager
  or
- By visiting the AFMC DPAS Web site at:
  http://www.ml.afrl.af.mil/ib/dpdsp/dpas.htm

APPENDIX C: Definition of Roles

AFMC DMSMS Program Office / Hub - The Hub, operated by AFRL/MLME, provides support, tools, resources, education and more to persons / organizations working DMSMS problems. The Hub manages a DMSMS database and provides additional assistance in large DMSMS cases for 59xx Federal Stock Class and is the principal AFMC focal point for DSCC and GIDEP generated discontinuance cases.

Defense Microelectronics Activity (DMEA) at McClellan AFB, CA - The Executive Agent for DoD integrated circuit activities, and responds to obsolete parts requests when no solution from any other source is available. See Appendix D for the web address for the DMEA. Provides engineering solutions (e.g. reverse engineering) to DMSMS problems upon request from various Air Force, DoD and Federal Agencies. Their capabilities include IC Design & Development, System Design & Development, Technology Assessment, Feasibility & Data Analysis, CAD/CAE, Reverse Engineering, and Component Testing.

Defense Supply Center, Columbus (DSCC) - As the Inventory Control Point (ICP) for all federal stock class 59XX (includes microcircuits and semiconductors), DSCC is a primary DMSMS discontinuance notification source. They query 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 (substitution, emulation, extended buy, etc.). To analyze and select appropriate options DSCC often requests support from the cognizant engineering support activity (ESA). For DSCC managed items in the 59xx federal stock class, the 88th LOG at Wright Patterson Air Force Base is the ESA.

DMSMS Command OPR - HQ AFMC/ENPM is the Office of Primary Responsibility (OPR) for the DMSMS program. As the command OPR, HQ AFMC/ENPM is responsible for policies, procedures, and, as required, the coordination of efforts with other DoD activities, federal agencies, and industry.

DMSMS Focal Points - Part-time, field level focal points at the ALC's and Product Centers who assist with the resolution of DMSMS issues, ensure the exchange of information and serve as the focal points for the receipt and distribution of Defense Logistic Agency (DLA) alert notices. They can exercise the API database to identify NHA's to further enable routing of DMSMS cases to all applicable system offices.

DMSMS Program Manager - AFRL/MLME is the DMSMS program office for the command. AFRL/MLME recommends policy / procedures and ensures that the command and field activities implement the DMSMS program. (Note: AFRL/MLME was formerly WL/MTPD)

DoD Teaming Group - Described in Section 4.1.

Engineering Support Activity (ESA) - The Military Service organization designated as responsible for engineering support and technical decisions for a given part or component in that Service. In the case of multiple recorded users in a Service, there may be more than one ESA.

Equipment Specialists - Equipment Specialists are typically responsible for major subsystems and interface with Item Managers to determine LOT requirements.

Government-Industry Data Exchange Program (GIDEP) - GIDEP is chartered by the Joint Logistics Commanders, administered by the Navy and funded by all military components. OSD has authorized GIDEP to serve as the centralized database for DMSMS. Additional information on GIDEP is provided in section 1.6.1 and appendix E of this guide.

Inventory Managers - Item / Inventory managers at the ALC's are responsible for management of selected parts and next higher assemblies. Item Managers interface with Equipment Specialists to determine LOT requirements. Following the "Consumable Item Transfer" initiative which resulted in most AFMC consumable piece parts becoming the responsibility of DSCC, AFMC Inventory Managers are primarily focused on unique AFMC components or repair-level systems.

Systems Engineering Community - The management function which controls the total system development effort for the purpose of achieving an optimum balance of all system elements. It is a process which transforms an operational need into a description of system parameters and integrates those parameters to optimize the overall system effectiveness.

APPENDIX D: DMSMS Case Resolution Data Sources

Thorough case analysis requires understanding the scope, impact and special considerations which apply in each DMSMS case. Many sources of parts, indenture and other related information exist which are invaluable to the DMSMS case evaluator. This includes the AFMC API database. DoD CD-ROM products are available which provide supply, maintenance, procurement, design, engineering, and other logistics data on items purchased / used by the government. Some of the primary products which may be useful for DMSMS investigations are listed below. The following listing is partial and only provided as a starting point for researchers. Many additional resources exist. Contact the AFMC DMSMS Hub for descriptions and point-of-contact information.

NOTE: These resources continually evolve, change, are discontinued, or are replaced without general notice being given.

Resources	POC
D200F Applications, Programs, Indentures (API) The API was principally created to serve the needs of maintenance management and is principally used by the ALC DMSMS community to determine which next higher assemblies incorporate a given discontinued part. This information is essential to the DSCC AFMC discontinuance notices process. **D200F (API) Overview.** The D200F Applications, Programs, and Indentures (API) system is a subsystem of the Air Force Requirements Data Bank (RDB). It is a relational, interactive database maintained at Wright-Patterson AFB OH. D200F is the official approved tool for maintaining indenture structures and programs for Air Force weapon systems. It also performs several computations, including engine programs, tailored modification programs, and application percents. API data provides information to assist users in functions related to Integrated Weapon System Management (IWSM). It produces output products for management of configured items and weapon systems. This includes information such as identification higher and lower assemblies, quantity per application (QPA) and application percent. *D200F includes the following categories of data:* -- The indenture portion identifies relationships of components to their higher assemblies and end items. -- The application portion relates aerospace vehicles, equipment, engines, and other end items to operational, inventory, and maintenance program data. -- The program portion identifies/provides past and projected program data and computes programs for engines and modifications, considering modification schedules, the number of components installed in an application, and percentages of the end item program in which a component is installed. **D200F features menu-driven navigation in each of the following functions:** -- The display function, which allows most users to view indenture and program data. -- The file maintenance function, which allows authorized users to update data that fall in their areas of responsibility. -- The output products function, which allows users to submit product and report requests and to review the status of requests already submitted (see the description of CA DISPATCH below). The notifications function, which advises ESs of changes or additions to the database that affect their workload. This includes any cataloging changes, file maintenance errors and user requested reports have not processed in CA Dispatch for viewing. The query function, using ADR DATAQUERY. DATAQUERY is a software package that allows the user to select, retrieve, and order data from the RDB databases.	*HQ AFMC LGIR* Steven A. Semple WPAFB, OH 45433 937-257-3407

Resources	POC
D200F produces "push" and "pull" products. Push products are output from the system on a regular basis e.g., weekly, monthly etc. Process and interface products are automatically output. Pull products are those that the user specifically requests when needed. These products are produced by request only during the cycle in which the request is received at the processing center. CA DISPATCH is a software package that processes and generates reports for all RDB subsystems. The D200F system was designed to be a paperless data system. Although printed products are available, CA DISPATCH initially processes both system generated ("push") and user requested ("pull") products for on-line viewing. If printed copies are desired, the user must execute a print command. CA DISPATCH retains system generated for three calendar days. The system assigns a job number to system generated reports using the user's next number sequence. Users may interrogate CA DISPATCH reports for availability of report that they and other users have generated. See Chapter 5 for instructions on viewing system generated reports. D200F is an unclassified database and classified data are not authorized. The RDB uses internal edits for system access, control and data processing.	*HQ AFMC LGIR* Steven A. Semple WPAFB, OH 45433 937-257-3407
D200 Requirements Data Base (RDB) The RDB system comprises a major set of logistics processes and models integrated by a large relational database. RDB automates and integrates AF materiel requirements determination processes which compute procurement and repair requirements for spares, repair parts and major equipment items. RDB uses a planning period of 38 quarters and recomputes quarterly. The relational database is the repository of detailed information showing the indentured application of every individual part of each particular aircraft type or end item. Within this structure the system holds historical and planning data needed to support computation quantities for buy and repair. The data includes: past and projected weapon system operating programs; future readiness goals, maintenance and modification schedule; item failure rates and condemnations. Data query, modeling and management report generation are on-line.	*AFMC MSG/LGIC* Joann Tudor, OPR WPAFB, OH DSN 787-5485
Haystack A DBMS linking over 35 DoD and other databases containing federal stock class information, information about vendors, standards, specifications, and construction regulations. Haystack is divided into five sections: Parts, Defense Specifications Service, Industry Standards Service, Construction Regulations Service, and vendor Selector Service. The Parts section contains stock and part numbers, CAGE codes, item description, applicable specifications and standards, technical information, item stockage history, and item usage data.	*Information Handling Services* 15 Inverness Way E PO Box 1154 Englewood, CO 80150-1154 800-716-1447
CD-FICHE Automated Logistics Procurement System Enables simplified searching through information related to over 12 million defense related parts.	*USA Information System, Inc.* 1092 Laskin Rd, Ste 208 Virginia Beach, VA 23451 800-872-8830. Sales Rep: Mack Cain 6733 Emerald Lakes Dr Troy, MI 48098 800-872-8830

Resources	POC
Federal Logistics Data (FED LOG) Logistics information system published monthly to retrieve part number, CAGE number, supplier, freight, and characteristic information. This system contains item data from the DLIS database as well as unique data from Army, Navy, and Air Force. FED LOG is For Official Use Only (FOUO) and is available on CD or DVD for a yearly subscription fee. The deletion of non-viable vendors from FED LOG (based upon the vendors who no longer produce the item listed) is an issue of concern.	*Customer Service Office, DLIS* Battle Creek, MI 49017 616-961-4771
Master Cross Reference Data (MCRD) The MCRD is a logistics information system published quarterly and contains all active and inactive NSNs. The MCRD is used to cross-reference part numbers, CAGE data, and NSNs and is designed to assist procurement/contracting and supply personnel. It also provides the user with replacement NSNs for canceled NSNs. The MCRD allows searches by FSC, NIIN, Part Number, Commercial and Government Entity (CAGE) Code and Item Name. Data output in the MCRD includes NSN, Item Name, Part Number, CAGE Code, Item Standardization Code (ISC), Reference Number Variation Code (RNVC), Reference Number Category Code (RNCC), Service/Agency Designator Code (SADC) and Description Availability (DA). The MCRD is non-restrictive and available to any potential or existing customers/users. It is available for an annual subscription fee.	*Customer Service Office, DLIS* Battle Creek, MI 49017 616-961-4771
D043 Master Item Identification Control System (MIICS) Central repository of AF Materiel Identification and supply managed by local organizations, contractors, and other military services. D043 contains extensive parts data.	*AFMC CASC/PCM* Mike Eddy, OPR WPAFB, OH DSN 932-5716
DO43A Master Item Identification Data Base System (MIIDB) provides on-line access to supply management data and cataloguing data for all DoD stock numbers and part numbers. Characteristics data and other services unique data are provided.	*AFMC CASC/PCM* Mike Eddy OPR WPAFB, OH DSN 932-5716
D043B Interchangeability and Substitution Suspense System (I&SSS) provides on-line capability to maintain Air Force interchangeability and substitution data.	*AFMC MSG/SHC* Leslie Davidson, OPR WPAFB, OH DSN 986-0501
D034A Special Support Stock Control and Distribution System (SSSCD) provides a uniform system management capability for world-wide property accounting, inventory control, and distribution/re-distribution of material. Non-AFMC interfacing activities are Army Material Command, Overhaul, and Production Contractors.	*AFMC/LGIC* Sara Black OPR WPAFB, OH DSN 787-7230
G099 Reliability & Maintainability Information System (REMIS) receives selected weapon system information from the Core Automated Maintenance System (CAMS), Technology Repair Centers (Depot and Contractor) and the Standard Base Supply System via the Defense Data Network. Data is available on a "Need to Know" basis.	*AFMC MSG/SQ* WPAFB, OH DSN 787-5077

Resources	POC
H Series CD-ROM product is published monthly by the DLSC and combines several Cataloguing Handbooks on one disc. **H2 Federal Supply Classification (FSC)** is a commodity classification system that can be used by supply catalogers to help group and define supply items for inclusion in to the Federal Catalog System. **H3 DoD Ammunition Codes** section provides a system of uniform, centrally assigned codes for generic descriptions of items classified as Ammunition and Explosives and Guided Missiles to be used by supply, maintenance and disposal personnel. **H4/H8 Commercial and Government Entity (CAGE) Codes** section is a comprehensive name and address listing of manufacturers and non-manufacturers worldwide who have done or are currently doing business with the government. It displays information required in procurement, requisitioning and technical research about Federal Government suppliers.	*Customer Service Office, DLIS* Battle Creek, MI 49017-3084 616-961-4771
DoD Teaming Group Database. As mentioned in Section 4 this tool is maintained by the DMSMS Teaming Group. The database provides a means to collaborate on known obsolete parts by establishing Teaming Group resolution cases. The database is designed to use the World Wide Web (WWW) to access, enter, modify, and store Teaming Group case data. There are currently two methods for entering data: (1) delineated ASCII files can be sent to the database administrator for upload, (2) manual entry by the participant. Specific criteria have been set up by the team to generate a case. When data is entered either by electronic or manual means, the database will automatically compare values of the Generic Part Number field to either create a new case, add the part to an existing case, or store the part for future reference. Once a case has been initiated, team members whose program is affected by the case, may enter and modify data such as program requirements and solution costs for that case. All members may view case data, as well as component data for which a case has not been initiated.	Jerry Martinez (805) 228-8197 martinez_jerry@phdnswc.nswses.navy.mil Jack McDermott (781) 377-6837 Mcdermottj@hanscom.af.mil *AFMC DMSMS Program Office* James Neely (937) 904-4374 James.Neely@wpafb.af.mil Monica Poelking (937) 904-4352 Monica.Poelking@wpafb.af.mil

Resources	POC
Avionics Components Obsolescence Management (AVCOM) AVCOM provides the user with the full complement of data for his specific system to address DMS issues. AVCOM, unlike other traditional commercial data sources, focuses on the specific part in the specific weapon system rather than the entire universe of semiconductors. Special attention is given to ensuring data accuracy from approved manufacturer availability and correctness of associated part numbers, as well as total industry sources of the same generic type and their verified catalog part numbers. The Objective Specification for AVCOM was driven by the demand for: -- Verified and continuously tracked data for the specific system. With >98% accuracy on part availability, the need for additional engineering resources to verify part availability is eliminated. -- All industry alternatives to approved part types are displayed, eliminating the need for additional engineering resources to develop part solution options from viable manufacturers. -- Analysis at the system, box and board levels for all parts, providing detail impact assessments. -- Obsolescence (Health) Projections for all assembly levels. With >90% accuracy on Projection of future part availability, proactive capability to determine cost-effective long term obsolescence management plans is provided. -- A family of evolving analytical modules (e.g., Cost Module for part versus board) to support decision-making at all levels. --Logistics Module for inputting critical logistics data (inventories, usage rates) to complete total impact assessments. -- "Linking" between managed systems to provide synergy of tracking and sharing solutions. -- Tracking of discontinued inventories with aftermarket suppliers. At the present, AVCOM is limited to electronic components, but will be expanded in the near future to include all elements of the manufactured system, spanning airframes to chemicals. The overall product will be called TDMPLUS, for Total DMS Management.	*MTI* POC Al Gregg Senior Account Manager (850) 664-6070 X327
TACTRAC An electronic military microcircuit library with custom software engineering tools for parts management. It contains over 100,000 individual military microcircuit devices, weapon system microcircuit usage, military microcircuit life cycle projections (estimates of how long an item will remain in production), and parts list risk analysis for long-term maintainability.	*i2 (Formerly TACTech, Inc.)* (Mal Baca) 22687 Old Canal Road Yorba Linda, CA 92887-4608 (714) 974-7676 (800) 669-8334

Resources	POC
Shared Data Warehouse: A database being developed as a joint service initiative. The warehouse will facilitate electronic exchange of DMS information across DoD and will provide a central repository, at GIDEP, for DMS management data. This information management tool will be a web-enabled database that automates existing DSCC internal DMS workflow processes. It will feature seamless data exchange and legacy data integration with rapid access to and analysis of logistics data. Planned databases to be accessed are: Army, GIDEP, H4/H8 -CAGE codes at DLIS Battle Creek, SAMMS, FLIS,, Air Force case history, DSCC, MEDALS, Navy and Industry. An Air Force Module of the Shared Data Warehouse will be developed to enhance the AF DMSMS Program Office Hub's automation efforts.	*AFRL/MLME* James Neely Wright-Patterson AFB Ohio 45433 (937) 904-4374 *AFRL/MLME* Monica Poelking Wright-Patterson AFB Ohio 45433 (937) 904-4352
FreeTradeZone. A service of PartMiner, Inc. This database accesses over 12,000,000 parts from 1,800 manufacturers. You can access the specs, replacement parts, find out whose selling the parts and will also try to find the hard-to-get parts.	http://www.freetradezone.com/
LOGRUN (Logistics Remote Users Network) is an on-line system providing interactive access to the most current Federal Logistics Information System (FLIS) data available. FLIS contains over 6 million active items of supply within the Federal Government. LOGRUN has three main branches: Logistics On-line Access (LOLA), Military Engineering Data Access Locator System (MEDALS), and Procedures.	*DLIS* Defense Logistics Information Service Battle Creek, MI 49017 DLIS Customer Service 1 (888) 352-9333
Government-Industry Data Exchange Program (GIDEP). GIDEP is chartered by the Joint Logistics Commanders, administered by the Navy and funded by all military components. OSD has authorized GIDEP to serve as the centralized database for DMSMS. Additional information on GIDEP is provided in section 1.6.1, 2.3, and appendix C & E of this guide.	*GIDEP* Bill Pumford P.O. Box 8000 Corona, CA 92878-8000 (909) 273-4289

APPENDIX E: DMSMS-Related WWW URLs

Note: A “Uniform Resource Locator (URL)” is a web address. Web site addresses change frequently. Contact the AFMC Hub URL for updates.

Organization	URL/Web Address
AF DMSMS Program Office	http://www.ml.afrl.af.mil/ib/dpdsp/dmsms.htm
AFMC DMSMS Program Office Government Links	http://www.ml.afrl.af.mil/ib/dpdsp/dmsms_govt_links.htm
DMSMS 2000 Conference Proceedings	http://smaplab.ri.uah.edu/dmsms2k/proceed.htm
Open Systems Initiatives	http://www.safaq.hq.af.mil/aqre/initiatives/osa.html
DLA / Defense Supply Ctr Columbus	http://www.dscc.dla.mil
DSCC DMSMS Prgm Office	http://www.dscc.dla.mil/Programs/dmsms/index.html
DSCC Standard Microcircuit Query Tool (QML-38534, 38535, and MIL-HDBK-103)	http://www.dscc.dla.mil/Programs/QplQml_Tools/combo.html
DSCC Master List of QMLs/QPLs	http://www.dscc.dla.mil/programs/qmlqpl/index.html
DSCC Parts Standardization and Management Committee	http://www.dscc.dla.mil/programs/psmc/
DLA/DSCC GEM Program	http://www.dscc.dla.mil/programs/gem/index.html
DSCC Military Parts Control Advisory Group (MPCAG)	http://www.dscc.dla.mil/programs/mpcag/index.html
Defense Logistics Information Service (DLIS)	http://www.dlis.dla.mil/
DMEA	http://www.dmea.osd.mil
Government-Industry Data Exchange (GIDEP)	http://www.gidep.org
Defense Acquisition Deskbook	http://www.deskbook.osd.mil/
Federal Acquisition Institute (FAI) (regarding commercial acquisition and market research)	http://www.gsa.gov/staff/v/training.htm
Air Force Logistics Management Agency (regarding commercial acquisition and market research)	http://www.il.hq.af.mil/aflma/lgc/lgcindex.html
Navy Crane DMSMS site	http://dtc-dms.crane.navy.mil/
Component Engineering Branch, "Part Requirement and Application Manual"	http://pats.crane.navy.mil/component/applications.htm
GEM (David Sarnoff Research Ctr)	http://www.gemes.com/

Figure E-1. Related World Wide Web URLs

* Note: For More DMSMS WWW Links visit the Links Pages on the AF DMSMS Program Office Web Site.

APPENDIX F: DMSMS Policy References & Procedure References

DMSMS Policy References

Note: Policy, like procedures, continually evolves. Be certain to verify current policies when undertaking a DMSMS activity.

Congressional Level:

Title 10, Chapter 131 Limitation on Acquisition of Excess Supplies. With certain exceptions, limits on-hand inventory (excluding war reserves) exceptions, limits on-hand inventory (excluding war reserves) to two years of operating stock [Life of Type (LOT) Buys to two years versus ten year buys.] With certification, more than two years can be purchased.

OSD Level:

DoD 4140.1-R DoD Materiel Management Regulation Dated: May 1998
Most recent OSD level guidance. Directs DoD components to minimize DMSMS impacts.

DoD 4400.1-M Department of Defense Priorities and Allocations Manual Dated: May 1995
Defense Priorities and Allocations System (DPAS) Describes when and how to obtain special priority assistance.

DoD 5000.2-R Mandatory Procedures for Major Defense Acquisition and Major Automated Information Systems Dated: 1996
This regulation makes no direct reference to DMSMS. Program Managers have the authority to take actions not prohibited by statute, Executive Order, FAR/DFARS and DODI 5000.2. Program Managers are not precluded from establishing a DMSMS Program. Although this regulation does not address specific problem areas like DMSMS but does divide acquisition activity into three major categories: (1) Translating Operational Needs into Stable, Affordable Programs, (2) Acquiring Quality Products, and (3) Organizing for Efficiency and Effectiveness. These categories and the directives apply to all defense acquisition programs. In each of these categories DMSMS issues are important considerations. Emphasis on risk management and affordability makes attention to obsolescence an absolute necessity.

MAJCOM Level:

AFMCI 23-103 DMSMS Program, dated 13 Oct 2000. Submitted to publication by HQ AFMC/ENPM, this publication is actually a logistics (supply) instruction which implements AFPD 23-1, "Requirements and Stockage of Materiel" and the policy provided in DoD 4140.1-R. "Applies to AFMC, its contractors, and Foreign Military Sales (FMS) customers for weapon systems no longer in AFMC inventory". "Limitation on Acquisition of Excess Supplies". With certain exceptions, limits on-hand inventory (excluding war reserves) to two years of operating stock. [Limits Life of Type (LOT) Buys to two versus ten year buys.] With certification, more than two years can still be purchased. Among the incorporated revisions in this document are: a) the mandatory use of GIDEP's MIS to maintain DMSMS historical files, and 2) the requirement to consider performance based requirements and Open Systems Architecture to minimize future DMSMS impacts.

Other Related Policy:

FASA The Federal Acquisition Streamlining Act (FASA) established a very broad definition of commercial items (FAR part 12) and created a statutory preference for their acquisition by federal agencies (note section 5.3.10).

FAR/DFARS The support for activities to minimize future DMSMS problems are many and varied. FAR — Part 10, Market Research dated 1 October 1999, prescribes policies and procedures for conducting market research to arrive at the most suitable approach to acquiring, distributing, and supporting supplies and services. FAR — Part 11 Describing Agency Needs dated 1 October 1999 prescribes policies and procedures for describing agency needs. Requirements are to be specified in terms of the functions to be performed; the performance required; or essential physical \ characteristics. Use of commercial items and nondevelopmental items is encouraged. FAR — Part 12, Acquisition of Commercial Items, 1 October 1999 prescribes policies and procedures unique to the acquisition of commercial items. It implements the Federal Government's preference for the acquisition of commercial items and establishes policy governing the acquisition of such products. FAR — Part 15 Contracting by Negotiation dated 1 October 1999 states that a forward pricing rate agreement to make certain rates available during a specified period may use projections of specific costs that include rates for material obsolescence. FAR – Part 16, Types of Contracts, dated 1 October 1999 16.703 authorizes use of a basic ordering agreement to expedite contracting for uncertain requirements for supplies or services when specific items, quantities, and prices are not known at the time the agreement is executed, but a substantial number of requirements for the type of supplies or services covered by the agreement are anticipated to be purchased from the contractor. The use of these procedures can reduce administrative lead-time, inventory investment, and inventory obsolescence. A basic ordering agreement is not a contract. This is not an exhaustive compilation of the possibilities afforded by the FAR/DFARS in dealing with obsolescence cases. It is meant to illustrate the fact that a variety of contractual provisions may be appropriate.

APPENDIX G:

DMSMS Case Verification and Analysis Worksheets

The following are three examples of the type of informal worksheets used by a number of SPOs to conveniently capture information required to analyze a DMSMS case. They are provided for your use.

Steps to complete this worksheet for both DSCC and AF managed items are shown below.
Note: Unless specified, the steps are identical.

DMSMS CASE VERIFICATION WORKSHEET **Alert Source: _____**
Case No. _____

1. Part ID Data

OEM P/N	AF P/N	GENERIC P/N	NSN
JAN	SMD	NHAs	

Figure G-1. Step 1 - Part Identification Data

Step 2 - All system applications are identified taking account of Engineering Change Proposals (ECPs) and revisions to existing drawings. This may require review of top-down break downs; the Program Parts Selection List (PPSL) [PPSL provides a list of standard and nonstandard parts selected for a specific design]; the Applications, Programs, and Indentures (API) database; and any other database available. From this review, the number of parts used in each end item is determined.

Step 3 - Life-of-Type (LOT) or future requirements are analyzed by projecting a lifetime demand for the item in question. (See *Appendix G. Fig G-7, Future Requirements Analysis Worksheet* for more detail on calculating this information.) This projection involves determining the demands and the current planned production, as well as calculating spares for existing operational equipment.

	APPLICATION	QUANTITY PER APPLICATIONS	NUMBER OF APPLICATIONS	TOTAL QUANTITY
1				
2				
3				
4				
5				

* Ensure consideration of additions / deletions due to ECPs.

Figure G-2. Step 3 - Application Data *
(See also Future Requirement Analysis Worksheet)

In large quantity cases, steps 1 and 2 may be accomplished by having API identify the next higher assemblies affected by the obsolete part. This information is forwarded to the item managers. *Future Requirements Analysis Worksheet* (Appendix G, Fig G-7) fields 3 through 14 are completed by the appropriate ICP and, depending on part management responsibility, requirements may be consolidated by the ICP.

To avoid miscalculation it is imperative that all future requirements be consolidated and that everyone impacted be kept informed. The Hub receives the data sheets from the ALCs and consolidates requirements for all users. When conducting a future requirements analysis, findings / figures are recorded on a *Future Requirements Analysis Worksheet*. This worksheet should include deletions and additions based on engineering changes or revisions. With this information, the *Case Verification Worksheet* is used to record the application data which includes application name, DMSMS item quantity per application, number of applications, and total DMSMS item quantity needed.

Step 4 - **For DSCC Managed Items:** The future requirements are provided to the AFMC DMSMS Program Office where they are consolidated and forwarded to DSCC.

Step 4 - **For AF Managed Items:** Contact the manufacturer of the part identified by the alert and conduct a manufacturing query guided by the verification worksheet.

IS THE PART CURRENTLY BEING PRODUCED? YES_____ NO_____	IS THE PART MANUFACTURED UNDER OTHER P/N? YES_____ NO_____
HOW LONG DOES MANF. PLAN TO PRODUCE PART?	DOES ANYONE ELSE MAKE THE SAME PART? WHO?
DOES THE CO. SELL THE PART TO OTHER MFRS: WHO?	WAS/WILL THE PRODUCTION LINE/INVENTORIES BE SOLD?
IS A REPLACEMENT OR NEW TECH. PART AVAILABLE? YES_____ NO_____ P/N?	WHAT IS LAST DATE FOR ORDER PROCESSING?
WHAT IS MINIMUM ORDER QUANTITY OR VALUE?	WHAT IS THE LATEST DELIVERY DATE?
UNDER WHAT CIRCUMSTANCES WILL THE COMPANY CONTINUE TO MANUFACTURE THE PART?	
HOW LONG WILL THE COMPANY PROVIDE REPAIR SERVICES FOR THE ITEM?	

Figure G-3. Step 4 - AF Managed Items: Manufacturing Query

Step 5 - **Identify Alternates:** Conduct a part number cross reference search to identify alternate government or commercial reference numbers which the DMSMS part may be listed under. At that time, identify all systems that might be using the DMSMS part that had not been previously identified. Once an alternate has been identified, validate availability (production plans) and acceptability of the potential replacement by engineering and specification review of the part to ensure form / fit / function interface (F^3I) and specification requirements are met.

Alternative P/N	Manufacturer (Name, Address, Phone, POC)
	Name: Address: POC: Phone:
	Name: Address: POC: Phone:

Figure G-4. Step 5 - Alternative Part Data

Upon validation of availability and acceptability, AFRL/MLME will pass the information on to the alert community. If the F³I review results in a minor degree of nonconformance, highlight those areas and keep that part in mind as a substitute. Utilization of the CD-ROM reference products listed in Appendix D will save time. These products can be used to determine alternate part numbers, to identify additional system applications and to accomplish associated manufacturer queries. Some examples of cross reference searches are listed below:

- Cross reference manufacturer's part number from alert to generic part number. Also cross reference generic part number to multiple manufacturers' part number.
- Cross reference part number to national stock number (NSN). Cross reference NSN to alternate NSN and to commercial and government entity (CAGE) code.
- Cross reference part numbers to CAGE code.
- Cross reference part numbers to Allowance Parts List (APL).

Step 6 - **For all Items:** A DMSMS case can be closed at this point, if there is no demand for the item or if the stock on hand satisfies the future requirement. If a case is closed, the history file must be annotated as such. If a demand exists, analysis of the case to identify an alternate manufacturer or an alternate part (Options Analysis, Section 4) begins.

DMSMS Determination - Options

a. No current application (no future requirements) - Close case, annotate office file and historical file (GIDEP) with "no current or projected demand"

b. Part available from another source (same NSN) - Close case, annotate office file and historical file (GIDEP) with "alternate source"

c. Part has application, substitute part (different NSN, part with new technology or part that may have similar form/fit/function) is available or substitute part not available. - Calculate future requirements and then perform cost analysis on resolution alternatives (Worksheet 2)

Figure G-5. Step 6 - DMSMS Determination - Options

DMSMS CASE VERIFICATION WORKSHEET

Alert Source: _____
Case No. _____

1. Part ID Data

OEM P/N	AF P/N	GENERIC P/N	NSN
JAN	SMD	NHAs	

2. Application Data * (From Future Requirements Analysis Worksheet)

	APPLICATION	QTY PER APPL	NUMBER OF APPL	TOTAL QTY
1				
2				
3				
4				
5				

* Ensure consideration of additions / deletions due to ECPs.

3. Manufacturing Query

IS THE PART CURRENTLY BEING PRODUCED? YES_____ NO_____	IS THE PART MANUFACTURED UNDER OTHER P/N? YES_____ NO_____
HOW LONG DOES MANF. PLAN TO PRODUCE PART?	DOES ANYONE ELSE MAKE THE SAME PART? WHO?
DOES THE CO. SELL THE PART TO OTHER MFRS: WHO?	WAS/WILL THE PRODUCTION LINE/INVENTORIES BE SOLD?
IS A REPLACEMENT OR NEW TECH. PART AVAILABLE? YES_____ NO_____ P/N?	WHAT IS LAST DATE FOR ORDER PROCESSING?
WHAT IS MINIMUM ORDER QUANTITY OR VALUE?	WHAT IS THE LATEST DELIVERY DATE?
UNDER WHAT CIRCUMSTANCES WILL THE COMPANY CONTINUE TO MANUFACTURE THE PART?	
HOW LONG WILL THE COMPANY PROVIDE REPAIR SERVICES FOR THE ITEM?	

Worksheet 1, Page 1

Figure G-6. DMSMS Case Verification

DMSMS CASE VERIFICATION WORKSHEET

Case No. _____

4. Alternative Part Data

Alternative P/N	Manufacturer (Name, Address, Phone, POC)
	Name: Address: POC: Phone:
	Name: Address: POC: Phone:
	Name: Address: POC: Phone:

5. DMSMS Determination

a. No current application (no future requirements) - Close case, annotate office file and historical file (GIDEP) with “no current or projected demand”

b. Part available from another source (same NSN) - Close case, annotate office file and historical file (GIDEP) with “alternate source”

c. Part has application, substitute part (different NSN, part with new technology or part that may have similar form / fit / function) is available or substitute part not available. - Calculate future requirements and then perform cost analysis on resolution alternatives (Worksheet 2)

6. Notes

Worksheet 1, Page 2

Figure G-6. DMSMS Case Verification Cont.

FUTURE REQUIREMENTS ANALYSIS

Date: _____
Analyst / Phone: _____
Case No. _____

MANUFACTURER:		P/N		DRAWING NO.		NSN:		
		1	2	3	4	5	6	Total
1	Application							
2	Quantity per Application*							
3	Number of Applications							
4	Total Population							
5	Failure Rate							
6	Raw Spares							
7	Repair Factor**							
8	Net Spares							
9	Non-Conformance Factor							
10	Final Spares							
11	Life-of-Service							
12	Raw Future Requirement							
13	Safety Factor***							
14	Net Future Requirement							
15	Inventory							
16	Final Future Requirement							
17	Availability Time frame							
18								
Cost Analysis								
19	Future Material Cost							
20	Future Overhead Cost							
21	Total Future Cost							

* This figure should include all additions/deletions based on ECPs or any other requirements.

** Will not be used for consumable items.

*** Will not be used in every case.

Worksheet 2

Figure G-7. Future Requirements Analysis Worksheet

DMSMS CASE RESOLUTION ANALYSIS WORKSHEET

Date:_____
Analyst/Phone:_____
Case No. _____

MANUFACTURER:	P/N	DRAWING NO.	NSN:
NHAs			
Cost Calculations For: **AFTERMARKET MANUFACTURERS**			
Engineering & Risk Assessment/Comments			
Source	Execution Time frame	Minimum Future Cost	
Cost Calculations For: **SUBSTITUTION**			
Engineering & Risk Assessment/Comments			
Source	Execution Time frame	Minimum Future Cost	
Cost Calculations For: **REDEFINING REQUIREMENT TO ACCEPT COMMERCIAL ITEM**			
Engineering & Risk Assessment/Comments			
Source	Execution Time frame	Minimum Future Cost	
Cost Calculations For : **EMULATION**			
Engineering & Risk Assessment/Comments			
Source	Execution Time frame	Minimum Future Cost	

Worksheet 3, Page 1

Figure G-8. DMSMS Case Resolution Analysis Worksheet

DMSMS CASE RESOLUTION ANALYSIS WORKSHEET

Date: _____
Analyst/Phone:_____
Case No. _____

Cost Calculations For: **LIFE-OF-TYPE (LOT) BUY**		
Engineering & Risk Assessment/Comments		
Source	Execution Time frame	Minimum Future Cost
Cost Calculations For: **DEVELOPING NEW SOURCE**		
Engineering & Risk Assessment/Comments		
Source	Execution Time frame	Minimum Future Cost
Cost Calculations For: **RECLAMATION**		
Engineering & Risk Assessment/Comments		
Source	Execution Time frame	Minimum Future Cost
Cost Calculations For: **REDESIGN**		
Engineering & Risk Assessment/Comments		
Source	Execution Time frame	Minimum Future Cost

Worksheet 3, Page 2

Figure G-8. DMSMS Case Resolution Analysis Worksheet Cont.

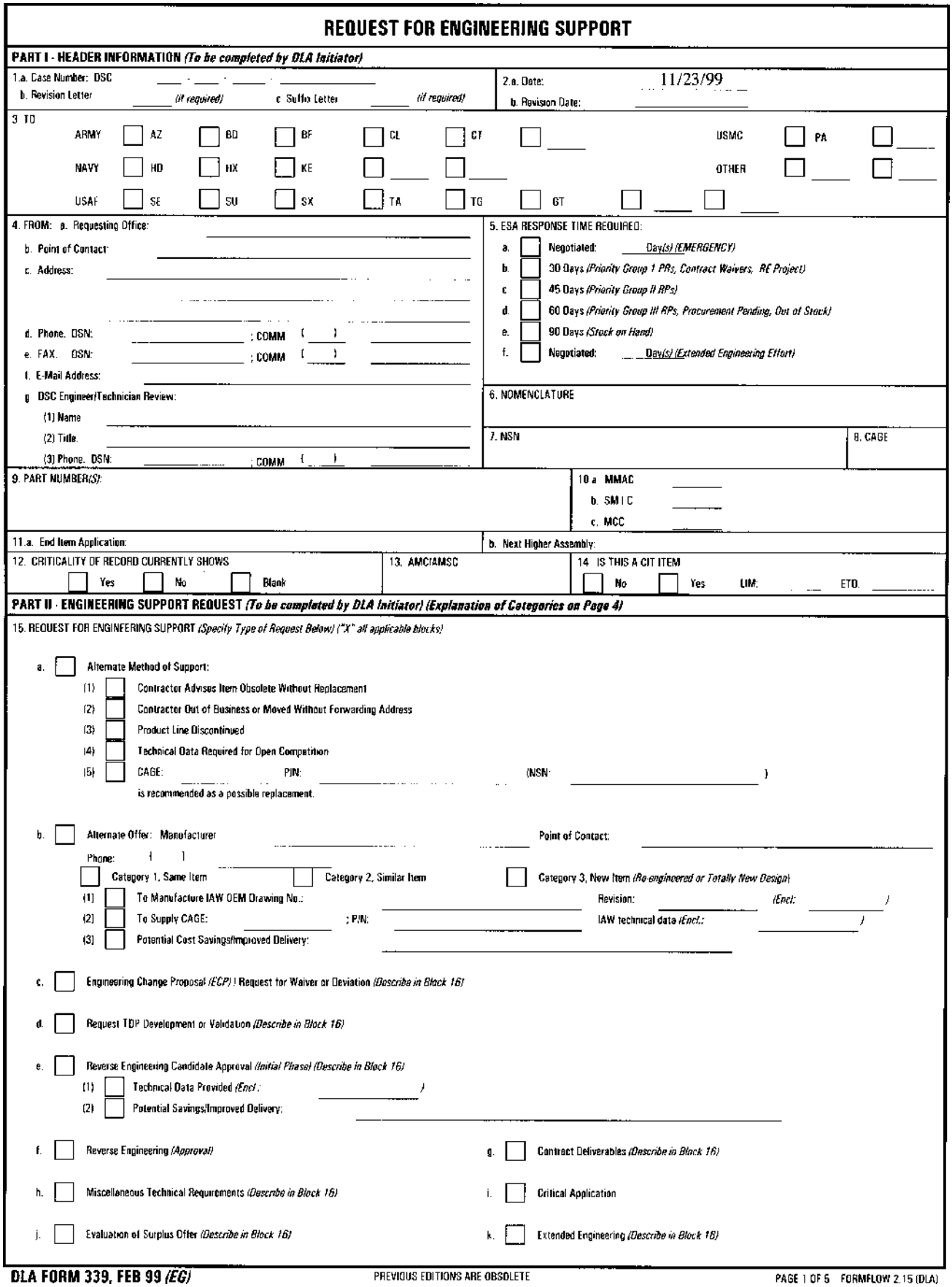
DMSMS CASE RESOLUTION ANALYSIS WORKSHEET

Date: _____
Analyst/Phone: _____
Case No. _____

Cost Calculations For: **CONTRACTOR MAINTAINED INVENTORY**		
Engineering & Risk Assessment/Comments		
Source	Execution Time frame	Minimum Future Cost
Cost Calculations For: **PRODUCTION WARRANTY**		
Engineering & Risk Assessment/Comments		
Source	Execution Time frame	Minimum Future Cost
Cost Calculations For: **REVERSE ENGINEERING**		
Engineering & Risk Assessment/Comments		
Source	Execution Time frame	Minimum Future Cost
Cost Calculations For		
Engineering & Risk Assessment/Comments		
Source	Execution Time frame	Minimum Future Cost

Worksheet 3, Page 3

Figure G-8. DMSMS Case Resolution Analysis Worksheet Cont.



REQUEST FOR ENGINEERING SUPPORT

PART I - HEADER INFORMATION (To be completed by DLA Initiator)

1.a. Case Number: DSC ____ - ____ - _____ - _____
b. Revision Letter _____ (if required) c. Suffix Letter _____ (if required)
2.a. Date: 11/23/99
b. Revision Date: _____

3. TO
ARMY ☐ AZ ☐ BD ☐ BF ☐ CL ☐ CT ☐ _____ USMC ☐ PA ☐ _____
NAVY ☐ HD ☐ HX ☐ KE ☐ _____ ☐ _____ OTHER ☐ _____ ☐ _____
USAF ☐ SE ☐ SU ☐ SX ☐ TA ☐ TG ☐ GT ☐ _____ ☐ _____

4. FROM: a. Requesting Office: _____
b. Point of Contact: _____
c. Address: _____
d. Phone. DSN: _____ ; COMM ( ) _____
e. FAX. DSN: _____ ; COMM ( ) _____
f. E-Mail Address: _____
g. DSC Engineer/Technician Review:
(1) Name _____
(2) Title. _____
(3) Phone. DSN: _____ ; COMM ( ) _____

5. ESA RESPONSE TIME REQUIRED:
a. ☐ Negotiated: ____ Day(s) (EMERGENCY)
b. ☐ 30 Days (Priority Group I PRs, Contract Waivers, RE Project)
c ☐ 45 Days (Priority Group II RPs)
d. ☐ 60 Days (Priority Group III RPs, Procurement Pending, Out of Stock)
e. ☐ 90 Days (Stock on Hand)
f. ☐ Negotiated: ____ Day(s) (Extended Engineering Effort)

6. NOMENCLATURE

7. NSN

8. CAGE

9. PART NUMBER(S):

10 a MMAC _____
b. SMIC _____
c. MCC _____

11.a. End Item Application:

b. Next Higher Assembly:

12. CRITICALITY DE RECORD CURRENTLY SHOWS ☐ Yes ☐ No ☐ Blank

13. AMCIAMSC

14. IS THIS A CIT ITEM ☐ No ☐ Yes LIM: ___ ETD. _____

PART II - ENGINEERING SUPPORT REQUEST (To be completed by DLA Initiator) (Explanation of Categories on Page 4)

15. REQUEST FOR ENGINEERING SUPPORT (Specify Type of Request Below) ("X" all applicable blocks)

a. ☐ Alternate Method of Support:
(1) ☐ Contractor Advises Item Obsolete Without Replacement
(2) ☐ Contractor Out of Business or Moved Without Forwarding Address
(3) ☐ Product Line Discontinued
(4) ☐ Technical Data Required for Open Competition
(5) ☐ CAGE: _____ PIN: _____ (NSN: _____)
is recommended as a possible replacement.

b. ☐ Alternate Offer: Manufacturer _____ Point of Contact: _____
Phone: ( ) _____
☐ Category 1, Same Item ☐ Category 2, Similar Item ☐ Category 3, New Item (Re-engineered or Totally New Design)
(1) ☐ To Manufacture IAW OEM Drawing No.: _____ Revision: _____ (Encl: _____)
(2) ☐ To Supply CAGE: _____ ; P/N: _____ IAW technical data (Encl.: _____)
(3) ☐ Potential Cost Savings/Improved Delivery: _____

c. ☐ Engineering Change Proposal (ECP) / Request for Waiver or Deviation (Describe in Block 16)

d. ☐ Request TDP Development or Validation (Describe in Block 16)

e. ☐ Reverse Engineering Candidate Approval (Initial Phase) (Describe in Block 16)
(1) ☐ Technical Data Provided (Encl.: _____)
(2) ☐ Potential Savings/Improved Delivery: _____

f. ☐ Reverse Engineering (Approval)

g. ☐ Contract Deliverables (Describe in Block 16)

h. ☐ Miscellaneous Technical Requirements (Describe in Block 16)

i. ☐ Critical Application

j. ☐ Evaluation of Surplus Offer (Describe in Block 16)

k. ☐ Extended Engineering (Describe in Block 16)

DLA FORM 339, FEB 99 (EG) PREVIOUS EDITIONS ARE OBSOLETE PAGE 1 OF 5 FORMFLOW 2.15 (DLA)

Figure G-9. Request for Engineering Support (DLA Form 339)

PART II - ENGINEERING SUPPORT REQUEST *(Continued)*

Case Number: DSC ____ ____ - _____ - _____ NSN:

16. SUPPLEMENTAL INFORMATION/COMMENTS

17. ENCLOSURES *(Identify by number and attach)*

PART III - EVALUATION *(To be completed by ESA)*

18. ☐ ADDITIONAL INFORMATION REQUIRED FROM INITIATOR *(See Block 22 for details)*

19. IS THIS ITEM ONE OF THE FOLLOWING?

a. CRITICAL APPLICATION ITEM ☐ Yes ☐ No b. FLIGHT SAFETY CRITICAL ☐ Yes ☐ No

c. FLIGHT SAFETY CRITICAL AIRCRAFT PART ☐ Yes ☐ No d. LIFE SUPPORT ITEM ☐ Yes ☐ No

20. ENGINEERING SUPPORT EVALUATION *("X" all applicable blocks)*

a. ☐ Alternate Method of Support for subject NSN has been identified s follows:

(1) ☐ Replacement identified: NSN: _____ or P/N: _____ ; CAGE: _____

(2) ☐ Alternate Source/Replacement Item/Technical Data cannot be identified, NSN cancellation is authorized

(3) (a) ☐ Supply by next higher assembly/kit, NSN: _____

(b) ☐ Fabricate/Assemble from the following: NSN: _____ , U/I: _____ ; QTY: _____

NSN: _____ , U/I: _____ ; QTY: _____

NSN _____ , U/I: _____ ; QTY: _____

b. The Alternate Offer has been:

(1) ☐ Approved (2) ☐ Disapproved *(See Block 22 for details)* (3) ☐ Conditionally Approved *(See Block 22 for details)*

c. The LCP/Request for Waiver or Deviation has been:

(1) ☐ Approved (2) ☐ Disapproved *(See Block 22 for details)* (3) ☐ Conditionally Approved *(See Block 22 for details)*

d. TDP Development/Validation status: (1) ☐ Enclosed (2) ☐ Technical data is not available

e. Reverse Engineering Project Initiation has been: (1) ☐ Approved (2) ☐ Disapproved *(See Block 22 for details)*

No. of Prototypes: _____ Cost Estimate of Test _____

Testing: ☐ ESA ☐ Outside Source *(Describe tests to be performed in block 22)*

f. Reverse Engineering *(Approval)* has been: (1) ☐ Approved (2) ☐ Disapproved *(See Block 22 for details)*

g. Contract Deliverables have been: (1) ☐ Approved (2) ☐ Disapproved *(See Block 22 for details)*

h. Miscellaneous Technical Requirements. *(See Block 22 for details)*

i. Critical Application Decision *(See Block 19) (Add description in Block 22)*

j. The Surplus Offer has been. (1) ☐ Approved (2) ☐ Disapproved *(See Block 22 for details)*

k. Extended Engineering. *(See Block 22 for details)*

DLA FORM 339, FEB 99 *(EG)* PAGE 2 OF 5

Figure G-9. Request for Engineering Support (DLA Form 339) Cont.

PART III - EVALUATION *(Continued)*

Case Number: DSC ____ - ____ ____ - _____ NSN: _____

21. ENGINEERING SUPPORT BILLING CHARGE

a. Scheduled Rate $0.00 b. Actual Hours _____

c. Cost Estimate *(completed by ESA for Extended Engineering Efforts only)* $ _____

22. SUPPLEMENTAL INFORMATION/COMMENTS

23 ENCLOSURES *(Identify by number and attach)*

24 a. Responsible ESA Office: _____ b. Date: _____ c. Point of Contact: _____

d. Address: _____

e. Phone. DSN: _____

COMM ( ) _____

f. Fax. DSN: _____

COMM: ( ) _____

g. E-Mail Address: _____

h. Reviewer. _____

DLA FORM 339, FEB 99 *(EG)* PAGE 3 OF 5

Figure G-9. Request for Engineering Support (DLA Form 339) Cont.

INSTRUCTIONS FOR COMPLETING DLA FORM 339

PART I - HEADER INFORMATION *(Completed by initiating DLA activity)*

BLOCK 1. **Case Number.** *(Format: DSC + Center (C, I, R, P) + and Business Unit (max 2-digits) + Fiscal Year (2-digits) + sequential (5-digit maximum, e.g., 00001)).* An example would be "**DSCC-E-99-00001**". NOTE: (1) If more than one activity is selected in block 3, add a separate alpha to the end of the sequential digit and send a separate request to each activity. (2) If the request is returned at a later date for additional information, complete block 1.c.

BLOCK 2. **Transmittal Date.** Use MM/DD/YYYY format. Requests returned for additional information will receive revised dates.

BLOCK 3. **To.** Enter the 2-letter Secondary Inventory Control Activity *(SICA)* Code from the latest Total Item Record *(TIR)* which lists all authorized originating and submitting activities. Either "X" the appropriate box or "write in" the letter for those activities not on the form.

BLOCK 4. **From.** Enter information on requesting office including complete office symbol, mailing address, name of individual and respective telephone and fax numbers, and e-mail address.

BLOCK 5. **ESA Response Time Required.** "X" appropriate letter block. Emergency items will be negotiated individually as will items requiring extended engineering effort. Examples of Emergency requests include production line stoppage, MICAP aircraft, etc.

BLOCK 6. **Nomenclature.** Enter the name as appears on the Total Item Record.

BLOCK 7. **NSN.** Enter National Stock Number of item involved. *(NOTE: Limited to a single NSN per form.)*

BLOCK 8. **CAGE.** Cite Manufacturer's 5-digit CAGE Code for the primary reference on the NSN.

BLOCK 9. **Part Number*(s)*.** Enter the primary manufacturer's Part Number*(s)* for item.

BLOCK 10. **MMAC/SMIC/MCC.** Enter the Air Force Materiel Management Aggregation Code *(MMAC)*, Navy Special Material Identification Code *(SMIC)*, or Army Materiel Category Code *(MCC)*, if available.

BLOCK 11. **a. End Item Application.** Indicate end item application for part cited, e.g., F-16 aircraft.
b. Next Higher Assembly. Indicate narrative description of next higher assembly, e.g., Landing Gear.

BLOCK 12. **Criticality of Record.** "X" appropriate block to reflect what DLA records show.

BLOCK 13. **AMC/AMSC.** Enter the Acquisition Method Code/Acquisition Method Suffix Code *(AMC/AMSC)*.

BLOCK 14. **CIT.** Indicate whether this item was transferred to DLA under the Consumable Item Transfer *(CIT)* program. If it is a CIT item, enter the 3-position Losing Item Manager *(LIM)* code and the 5-digit Estimated Transfer Date *(ETD)*. NOTE: Due to Base Realignment and Closure *(BRAC)*, many ESAs have been reorganized. This information will aid the receiving focal point in determining the correct ESA within their Military Service.

PART II - ENGINEERING SUPPORT REQUEST *(To be completed by DLA initiator)*

BLOCK 15. **Request for Engineering Support.** [illegible] the request. The specific categories are as follows:

Alternate Method of Support	The existing sources "no bid", and another means of support is required. This may include an item substitution, as recommended by the ESA, development of a technical data package to solicit other sources, using the Next Higher Assembly, etc.
Alternate Offer	An evaluation of a product that is other than the exact product. The exact product means the identical product described by the manufacturer's name and part number cited in the PID, modified *(if necessary)* to conform to any additional requirements set forth in the PID, and manufactured by or under the direction of the manufacturer cited in the PID. Use this category for **Source Approval Request*(s)***. Use DLAI 3200.1, Enclosure 6, as a guide in preparing evaluations for alternate offers for Flight Safety Critical Aircraft Parts *(FSCAP)*.
Engineering Change Proposal *(ECP)* / Waiver/Deviation	A Government or contractor request for approval of an ECP, Value Engineering Change Proposal *(VECP)*, Deviation, or Waiver. The request should include adoption of the change to the Technical Data Package *(TDP)*, if applicable.

DLA FORM 339, FEB 99 (EG)

PAGE 4 OF 5

Figure G-9. Request for Engineering Support (DLA Form 339) Cont.

PART II, BLOCK 15 ***(Continued)***	
TDP Development/ Validation	A request for (1) development of a TDP to acquire the NSN competitively for the first time, or (2) validate a competitive TDP to ensure all configuration changes have been incorporated since the TDP was first developed.
Reverse Engineering *(RE) (Initial Phase)*	A review to determine if an NSN is a viable RE candidate. This is to be done at the beginning of any RE project.
Reverse Engineering *(Approval)*	A review of the final RE package to determine final acceptability by the ESA.
Contract Deliverables	A review of Contract Data Requirements List *(CDRL)* products from the contractor.
Miscellaneous Technical Requirements	Use this category ONLY if there is no other category that adequately describes your request.
Critical Application Decision	Self-explanatory.
Surplus Offer	Self-explanatory.
Extended Engineering	Do NOT use this category for an initial request. Extended engineering is used only when an ESA negotiates with the DSC for additional time or funding to complete the evaluation.

BLOCK 16. **Supplemental Information/Comments.** Enter any supplemental information or comments necessary to fully explain or understand the request.

BLOCK 17. **Enclosures.** Identify any enclosures required *(by number)*.

PART III - Evaluation ***(To be completed by ESA)***

BLOCK 18. **Additional Information Required.** Upon receipt of the DLA Form 339, the ESA shall review the content. If the contents are insufficient to conduct an evaluation, "X" block 18, complete Block 24, and return it to the originating Defense Supply Center *(DSC)* Focal Point with a description in block 22 of the information that is lacking.

BLOCK 19. **a. Critical Application Item.** An item that is essential to weapon system performance or operation, or the preservation of life or safety of operating personnel, as determined by the Military Services. "X" the appropriate block. In block 22, describe the application.

b. Flight Safety Critical Part. An aircraft part, assembly, installation or production system with one or more critical characteristics, which, if not conforming to the design data or quality requirements, would result in an unsafe condition. "X" the appropriate block.

c. Flight Safety Critical Aircraft Part. Any part, asssembly, or installation containing a critical characteristic whose failure, malfunction, or absence could cause a catastrophic failure resulting in loss or serious damage to the aircraft or an uncommanded engine shutdown resulting in an unsafe condition. "X" the appropriate block.

d. Life Support Item. All man-mounted or aircraft-installed equipment and components designed to protect, sustain, or save human lives are categorized as Life Support. This includes *(but not limited to)* : ejection systems, crew seats, passenger seats, emergency escape slides, parachutes, life rafts and preservers, survival kits, emergency radios and beacons, aircrew helmets, oxygen masks, goggles, visors, chemical defense equipment, and selected clothing and uniform items. "X" the appropriate block.

BLOCK 20. **Engineering Support Evaluation.** Complete the appropriate section, based on the original request. Provide details for Conditionally Approved items in block 22.

BLOCK 21. **Engineering Support Billing Charge.** The scheduled rate will be automatically filled based on block 15. Submit the actual work-hours for engineering support in block 21.b. For extended engineering efforts, the ESA shall submit a funding cost estimate.

BLOCK 22. **Supplemental Information.** Provide any supplemental information or comments in this space, e.g., type of additional information required, details of conditional approval or reason*(s)* for disapproval.

BLOCK 23. **Enclosures.** Identify, by number, any enclosures being returned to the DSC along with the completed evaluation and attach these to this form.

BLOCK 24. **Responsible ESA Office.** Enter the activity's office symbol, mailing address, point of contact, telephone and fax numbers, and e-mail address.

DLA FORM 339, FEB 99 ***(EG)*** PAGE 5 OF 5

Figure G-9. Request for Engineering Support (DLA Form 339) Cont.

INDEX

INDEX (Cont'd)

U.S. AIR FORCE

DMSMS is a serious problem, and an unavoidable one. But it is also one that can be effectively managed, if we utilize clear communications and a clearly defined, systematic plan of attack. The purpose of this document is to provide clear, effective, proven approaches to identify and lessen DMSMS risk.

The AFMC DMSMS Program Office Hub is confident the Guide can serve to...

"*protect weapon system supportability while reducing total ownership cost*."

Visit the AFMC DMSMS Web site for more helpful DMSMS information. http://www.ml.afrl.mil/ib/dpdsp/dmsms.htm