



INTRODUCTION TO PARTS MANAGEMENT

Parts Standardization and Management Committee

LMI

COURSE INFORMATION



Defense Acquisition University

- Continuous Learning
 - Register
 - Browse
- CLL 206 Introduction To Parts Management
- 1.5 Continuous Learning Points



THE “PARTS” IN PARTS MANAGEMENT



The term “part” could denote different hardware levels depending on how it is used.

A part is “one or more pieces joined together, which are not normally subject to disassembly without destruction or impairment of their intended design use.”

Several examples of these part types include:



Microcircuits
Connectors
Resistors
Capacitors
Fasteners

Bearings
Valves
Screws
Rivets



OVERVIEW



Today's weapon systems and equipment acquisition environment are characterized by

- Rapidly changing designs
- Increased use of commercial part types
- Offshore manufacturing of parts
- Diminishing manufacturing sources and material shortages (DMSMS)
- Counterfeit parts detected in the supply chain
- Use of lead-free electronic parts

OVERVIEW

(Cont'd)



These factors have increased risk for Department of Defense (DoD) weapon systems and equipment acquisition contracts.

The need to have an effective Parts Management Program is greater than ever before.

The Parts Management Program is an integral part of the acquisition process for design, development, and support of weapon systems and equipment.

WHY IS PARTS MANAGEMENT IMPORTANT?



The tasks of selecting, specifying and ensuring proper design applications, as well as managing parts used in complex systems, are major engineering tasks.

Parts are the building blocks from which systems are created and greatly impact hardware dependability and readiness. Since the reliability, maintainability, and supportability of the end item are dependent upon these building blocks, the importance of selecting and applying the most effective parts management program cannot be overemphasized.

WHY IS PARTS MANAGEMENT IMPORTANT? (Cont'd)



Parts management takes on even greater importance in light of the current defense acquisition environment.

In recent DoD acquisition direction, “Better Buying Power 3.0,” the top two initiatives focus on cost efficiency:

- ***achieve affordable programs***
- ***achieve dominant capabilities while controlling lifecycle costs***



» ***Better Buying Power 3.0***
» ***Issued September 19, 2014***

WHAT IS PARTS MANAGEMENT? (Cont'd)



Parts management is an integrated effort to streamline the selection of preferred or commonly used parts during the design of weapon systems and equipment under an overarching Systems Engineering framework.

This process determines the optimum parts while considering all the factors that may affect program outcomes.

WHAT IS PARTS MANAGEMENT? (Cont'd)



MIL-STD-3018 defines parts management as:

“...the practice of considering the application, standardization, technology (new and aging), system reliability, maintainability, supportability, and cost in selecting parts and addressing availability, logistics support, DMSMS, and legacy issues in supporting them throughout the life of the systems.”

WHY IS PART SELECTION IMPORTANT?



The most crucial element of parts management is part selection. The primary requirement is to meet the performance objectives of the system or equipment. Many factors must be considered when selecting the optimum parts.

These include:

- *Technical characteristics*
- *Reliability*
- *Life cycle costs*
- *Commonality*
- *Performance history*
- *Vendor performance*
- *Qualification*
- *Potential Obsolescence*
- *Standardization*
- *Manufacturing*
- *Maintenance*

WHY IS PART SELECTION IMPORTANT? (Cont'd)



Proper part selection can enhance

- *Reliability*
- *Maintainability*
- *Economies of scale*
- *Supportability*
- *System performance*
- *Logistics readiness*
- *Operational readiness and interoperability*

Proper part selection can decrease

- *Logistics footprint*
- *Weapon systems and equipment total ownership costs*

WHAT ARE THE BENEFITS OF PARTS MANAGEMENT?



Benefits include:

- Cost avoidance
 - Standardization of parts and replacing numerous similar parts with one common part results in larger part-type buys because the common parts are used in multiple applications.
 - Part standardization also helps the contractor avoid the increased cost of maintaining technical data and storing, tracking, and distributing multiple parts.

WHAT ARE THE BENEFITS OF PARTS MANAGEMENT? (Cont'd)



-
- Enhanced logistics readiness and interoperability
 - When items or systems share common components, repair time is shorter because parts are more likely to be on hand.
 - Using common components simplifies logistics support and enhances substitutability because fewer parts are stocked.
 - This translates into savings in procuring, testing, warehousing, and transporting parts.

WHAT ARE THE BENEFITS OF PARTS MANAGEMENT? (Cont'd)



- Increased supportability and safety of systems and equipment
 - Preferred parts reduce risk and improve the chances of equipment reliability.
 - Preferred parts have a history of proven reliability, withstanding rigorous testing, and performing at stated levels.
 - Their use decreases the number of part failures, reducing the number of maintenance actions, and potentially precluding failures or loss of life.

WHAT ARE THE BENEFITS OF PARTS MANAGEMENT? (Cont'd)



-
- Reduced acquisition lead-time
 - When preferred parts are used, the Government and industry avoid the expenses and delays of designing and developing parts and the issues of acquiring a new item with no available history or documentation.
 - Using preferred parts often reduces the time between the purchase request and the receipt of the part.

COST BENEFIT ANALYSIS



The average total cost for adding a single new part is about **\$27,500**. Historical acquisition program parts management data has revealed that programs without parts management requirements introduce **2.5 percent** more new parts into the logistics system than do programs with parts management requirements.

Therefore, a program with **10,000 parts** might easily achieve a life-cycle cost avoidance of **\$6.8 million**.

COST BENEFIT ANALYSIS (Cont'd)



Six cost-related program activities:

- *Engineering and design*
- *Testing*
- *Manufacturing*
- *Purchasing*
- *Inventory*
- *Logistics support*



Detailed information can be found in the business case:

“Reduce Program Costs through Parts Management”

(developed by the PSMC)

(See https://www.dsp.dla.mil/app_uil/content/documents/partsmgt.pdf).

COST BENEFIT ANALYSIS (Cont'd)



The cost of resolving part obsolescence problems can range from a low cost for an administrative substitute solution to a very high cost for a major redesign effort.

The DMSMS resolution cost elements are addressed in SD-22, “Diminishing Manufacturing Sources and Material Shortages (DMSMS) Guidebook.”

COST BENEFIT ANALYSIS (Cont'd)



Reliability, Availability and Maintainability (RAM) are system design attributes that have significant impacts on the sustainment or total Life Cycle Costs of a developed system. Additionally, the RAM attributes impact the ability to perform the intended mission and affect overall mission success.

***DoD Reliability, Availability, and Maintainability, and Cost Rationale Report Manual of June 1, 2009
(Prepared by OSD)

APPLICABILITY OF PARTS MANAGEMENT REQUIREMENTS



-
- Acquisition contracts
 - New design
 - Modification of DoD weapon systems
 - Dependent upon program business and support strategies
 - Not applicable to
 - Off-the-shelf
 - Not intended for Space systems such as satellites and launch vehicles



DEFENSE STANDARDIZATION PROGRAM



DoDM 4120.24, Defense Standardization Program Procedures, September 24, 2014

Encl 4: MANDATORY STANDARDIZATION CONSIDERATIONS

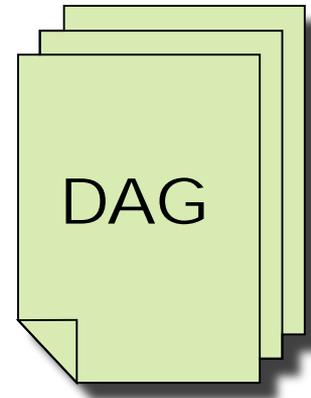
2.c. Parts Management. Program offices must apply standardization processes to improve parts commonality... Program offices should ensure that a parts management process is used to reduce the proliferation of parts and associated documentation and promote the use of parts with acceptable performance, quality, and reliability, as specified in MIL-STD-3018. Total ownership cost analysis must also be applied in the selection of parts for the program.

DEFENSE ACQUISITION GUIDEBOOK



Parts management information is referenced in the **Defense Acquisition Guidebook (DAG)** in Chapter 4: Systems Engineering and Chapter 5: Life Cycle Logistics:

- Section 4.3.18.8: Diminishing Manufacturing Sources and Material Shortages
- Section 4.3.18.21: Standardization (Parts Management)
- Section 5.3.1: Standardization (Parts Management)



WHEN SHOULD PARTS MANAGEMENT BE IMPLEMENTED?



Technology Maturity and Risk Reduction Phase (Milestone A). All requirements as stated in MIL-STD-3018 should be specified in the request for proposal statement of work for the Engineering and Manufacturing Development Phase.

Engineering and Manufacturing Development Phase (Milestone B). Requirements as stated in MIL-STD-3018 should be implemented under an approved parts management plan.

WHEN SHOULD PARTS MANAGEMENT BE IMPLEMENTED? (Cont'd)



Production and Deployment Phase (Milestone C).

Required for changes or modification to the baseline design or parts obsolescence issues.

HOW ARE PARTS MANAGEMENT REQUIREMENTS IMPLEMENTED?



Parts management requirements should be documented in the

- Statement of work (SOW)
- Statement of objectives (SOO)
- Performance work statements (PWSs)

(Collectively known as the SOW)



HOW ARE PARTS MANAGEMENT REQUIREMENTS IMPLEMENTED? (Cont'd)



SOW Example:

The contractor shall establish and maintain a parts management program in accordance with MIL-STD-3018 for all new designs or modified equipment. The contractor shall describe how the parts management process is validated, how process improvements are incorporated, and how process variation is controlled.

The contractor shall document the plan in accordance with DID DI-SDMP-81748 and deliver the plan in accordance with the CDRL (DD Form 1423).

MIL-STD-3018

“PARTS MANAGEMENT”



-
- Department of Defense Standard Practice
 - Provides requirements for the implementation of an effective Parts Management Program
 - Supports acquisition strategies and systems engineering practices
 - Provides performance-based parts management processes and practices which are intended to be adopted to individual program needs

MIL-STD-3018

“PARTS MANAGEMENT”



-
- Creates consistency across DoD parts management requirements in contracts
 - Requires a parts management plan
 - When used in conjunction with **SD-19, “Parts Management Guide,”** it outlines parts management needs in contracts, parts management processes for prime contractors and subcontractors

WHAT IS A PARTS MANAGEMENT PLAN?



“A parts management plan is a contract-specific application of a contractor’s corporate parts management procedures which meets the objectives of the equipment system’s mission profile, support strategy, expected service life, and the DoD parts management goals and objectives of reducing the logistics footprint and total life-cycle cost, and increasing operational and logistics readiness.”

WHAT IS A PARTS MANAGEMENT PLAN? (Cont'd)



A parts management plan communicates how the contractor's in-house parts management process is conducted under the contract requirements.

The plan is prepared by the contractor.

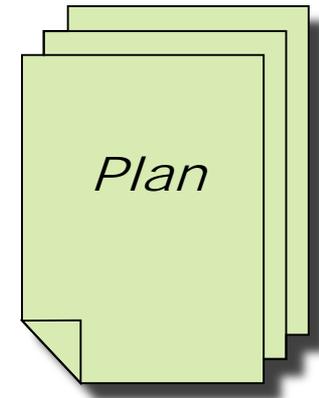
The contractor must meet plan requirements or recommend changes based on:

- Changes in part type technical or environmental issues.
- Changes in the parts procurement business environment.

ELEMENTS OF A MIL-STD-3018 PARTS MANAGEMENT PLAN



- Part selection baseline
- Part selection and authorization process
- Obsolescence management
- Parts list
- Subcontractor management
- Part and supplier quality
- Part level documentation procedures
- Substitute and alternative part procedures
- Customer-contractor teaming
- Counterfeit parts
- Lead-Free electronic parts
- Additional elements (e.g. as identified by contract)



MIL-STD-3018

PART SELECTION ORDER OF PREFERENCE



- The contractor shall select parts suitable to the design application. Parts standardization shall be considered a key objective in parts selection in order to minimize the proliferation of parts and the logistics spare parts sustainment cost for DOD. Unless otherwise specified in the contract the DoD order of preference for parts selection is shown, in descending order:
 - Parts required to meet Government regulatory requirements
 - Parts that readily available within the DoD system, have projected continued usage within DoD and have a documented technical description available to the DoD and industry

MIL-STD-3018

PART SELECTION ORDER OF PREFERENCE

(Cont'd)



- Industry standard parts from DoD adopted non-Government standards.
- Military and other Government standard parts.
- Industry standard parts from other non-Government standards
- Commonly available manufacturers' part numbers from catalogs and/or Vendor Item Drawings.
- Other (e.g., parts documented on source control drawings, selected item drawings, altered item drawings).

PARTS MANAGEMENT BENEFITS SUMMARY



-
- Reduces proliferation of parts
 - Provides economy of scale through larger volume buys
 - Reduces part and supplier qualifications
 - Reduces part obsolescence occurrences
 - Lowers documentation costs
 - Reduces acquisition lead time
 - Reduces inventory costs
 - Improves producibility
 - Simplifies supply chain management

PARTS MANAGEMENT BENEFITS SUMMARY (Cont'd)



- Improves product quality and reliability
- Enhances system supportability
(part availability & maintainability)
- Commonality
- Enhances interchangeability
- Reduces total ownership cost

WHO DOES PARTS MANAGEMENT?



Both the acquisition activity and the contractor have responsibilities concerning the implementation of parts management requirements.

The acquisition activity is responsible for determining and/or tailoring all initial parts management requirements, coordinating and negotiating those requirements with the contractor, and evaluating and approving the required contractor submitted plans or processes.

WHO DOES PARTS MANAGEMENT? (Cont'd)



The contractor is responsible for teaming with the acquisition activity to implement Parts Management Program contract requirements.

Part selection and application is the responsibility of the contractor whose primary requirement is to meet the performance objectives of the system or equipment.

WHAT ARE THE COSTS OF PARTS MANAGEMENT?



Costs reflected in the contract include the tasking to implement and maintain a parts management process for the life of the contract.

Costs are determined by the individual weapon system or equipment acquisition contract life cycle phase; with the highest cost found in the Engineering and Manufacturing Development Phase.

Costs are reduced during the subsequent life cycle phase depending upon the reduction of design effort concerning changes and modifications to the weapon system or equipment.

WHAT TOOLS SUPPORT PARTS MANAGEMENT?



- ASSIST
(See <http://quicksearch.dla.mil/>)
- Weapon System Impact Tool (WSIT)
(See <https://assist.dla.mil/>)
- DMSMS/Obsolescence Tools
(See <https://acc.dau.mil/dmsms>)
- DLA Land and Maritime – Document Standardization Division Website
(<http://www.dla.mil/LandandMaritime/Offers/Services/TechnicalSupport/DocStandDiv.aspx>)



WHAT TOOLS SUPPORT PARTS MANAGEMENT?

(Cont'd)



- Common Parts Catalog
(See <http://www.dtic.mil/dtic/tr/fulltext/u2/a570564.pdf>)
- Government-Industry Data Exchange Program (GIDEP)
(See <http://www.gidep.org/>)
- Defense Parts Management Portal (DPMP)
(See <https://dpmp.lmi.org/>)
- Pin Point
(See <https://pinpoint.xsb.com/>)



SE THROUGHOUT LIFE-CYCLE MANAGEMENT



A life-cycle approach to system planning, development, and sustainment is fundamental to systems engineering. The program manager (PM) shall be the single point of accountability for accomplishing program objectives for total life cycle systems management, including sustainment.

SE THROUGHOUT LIFE- CYCLE MANAGEMENT (Cont'd)



PMs shall consider supportability, life cycle costs, performance, and schedule comparable in making program decisions. Planning for Operations and Support and the estimation of total ownership costs shall begin as early as possible. Supportability, a key component of performance, shall be considered throughout the system life cycle.

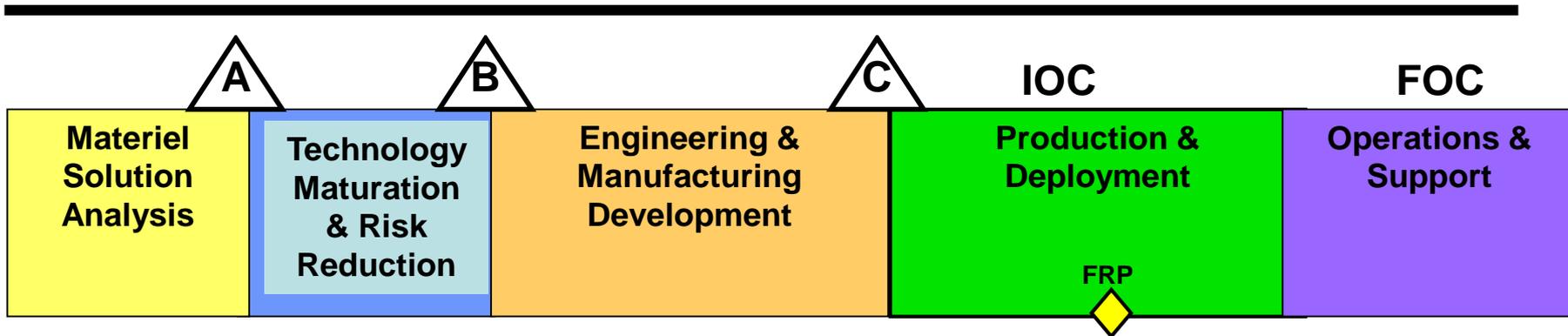
SE THROUGHOUT LIFE- CYCLE MANAGEMENT (Cont'd)



Parts Management along with standardization are SE design considerations. Selecting the right part is fundamental to achieving many SE and manufacturing objectives.

- From a PM perspective, these design considerations ensure the system is made up of proven parts with existing suppliers
- From a systems engineering perspective, these design considerations enable a reliable, maintainable, affordable system that performs well

TECHNICAL REVIEWS & LOGISTICS ASSESSMENTS THROUGHOUT THE LIFE CYCLE



Technical Reviews



Logistical Assessments



ASR: Alternative Systems Review
SRR: System Requirements Review
SFR: System Functional Review

PDR: Preliminary Design Review
CDR: Critical Design Review
PRR: Production Readiness Review

NATURE OF THE TECHNICAL REVIEW CHECKLISTS



Systems Engineering Technical Reviews

Logistics Assessments

Parts Management Requirements

Per MIL STD 3018

SRR	SFR	PDR	CDR	PRR

MS B, MS C, FRP	POST IOC

Checklists to be used by parts management practitioner prior to the actual technical review to identify risks that need to be put on the agenda

PARTS MANAGEMENT STATUS AT SRR



-
- **MIL-STD-3018 on contract**
 - **Requirement for BOM on contract**
 - **Substitute parts usage procedures established as configuration management requirement**
 - **Customer-contractor teaming arrangements defined**
 - **Anti-counterfeit requirements established**
 - **Lead-free control requirements established**

PARTS MANAGEMENT STATUS AT SFR



-
- Preliminary parts management plan developed
 - Corporate baseline parts selection list in place
 - Parts selection order of preference established
 - Obsolescence management risk assessment ongoing
 - Substitute parts usage procedures established
 - Customer-contractor teaming ongoing
 - Preliminary anti-counterfeit plan developed
 - Preliminary lead-free control plan developed

PARTS MANAGEMENT STATUS AT PDR



-
- **Parts management plan implemented**
 - **Corporate baseline parts selection list maintained**
 - **Parts selection process in place**
 - **Obsolescence management risk assessment ongoing**
 - **Parts management requirements being flowed down to subcontractors**
 - **Part and supplier quality established**
 - **Substitute parts usage procedures followed**
 - **Customer-contractor teaming ongoing**
 - **Anti-counterfeit plan implemented**
 - **Lead-free control plan implemented**

PARTS MANAGEMENT STATUS AT CDR



-
- **Parts management plan approved**
 - **Corporate baseline parts selection list maintained**
 - **Parts selection process in place**
 - **Obsolescence management risk assessment ongoing**
 - **BOMs have been submitted**
 - **Parts management requirements being flowed down to subcontractors**
 - **Part and supplier quality established**
 - **Substitute parts usage procedures followed**
 - **Customer-contractor teaming ongoing**
 - **Anti-counterfeit plan being followed**
 - **Lead-free control plan being followed**

PARTS MANAGEMENT STATUS AT PRR



-
- **Parts management plan approved**
 - **Corporate baseline parts selection list maintained**
 - **Parts selection process in place; all parts have been approved**
 - **Obsolescence management risk assessment ongoing**
 - **BOMs have been accepted**
 - **Parts management requirements being flowed down to subs**
 - **Part and supplier quality established**
 - **Part documentation documents meet requirements**
 - **Substitute parts usage procedures followed**
 - **Customer-contractor teaming ongoing**
 - **Anti-counterfeit plan being followed**
 - **Lead-free control plan being followed**

WHO IS RESPONSIBLE FOR DoD PARTS MANAGEMENT?



Currently, DoD weapon systems and equipment programs are experiencing increased risk due to problem part issues.

The Defense Standardization Program Office (DSPO) is responsible for the DoD Parts Management Program. In November 2006, the DSPO chartered the Parts Standardization and Management Committee (PSMC) to advise in the development of policy, procedures, and guidance related to parts management.

WHO IS RESPONSIBLE FOR DoD PARTS MANAGEMENT? (Cont'd)



The DSPO's goal is to establish parts management best practices across DoD to increase weapon system operational availability and reduce life cycle costs. The PSMC offers a standing forum for DoD and industry communication and collaboration to promote and enable effective parts management in support of the warfighter.

CONCLUSION



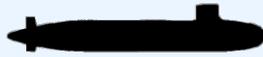
One cannot overstate the importance of systems engineering—and the specialty engineering disciplines associated with it—to successful, cost-effective acquisition. Parts management contributes to the overall SE mission in the risk identification and management and the life-cycle focus areas.

Today's parts management program is becoming more flexible, more user friendly for contractors, and more comprehensive due to a major reengineering effort that is still underway.

CONCLUSION (Cont'd)



The PSMC will continue to address SE parts management initiatives with help from the SE and parts management communities. To be involved in this effort, please contact the DSPO Project Leader: 703-767-6874.



Seawolf Class

Seawolf Problem -

Parts Proliferation

- Many duplicate part numbers created by two design yards, one construction shipyard
- Existing design standards seldom used
- No standard criteria established
- 67,834 bill of material parts



Virginia Class

Virginia Solution -

Instituted parts stdz at BEGINNING of design phase

- Upfront standardization program prevented parts proliferation
- 27,014 bill of material parts
- \$789M cost avoidance over program life