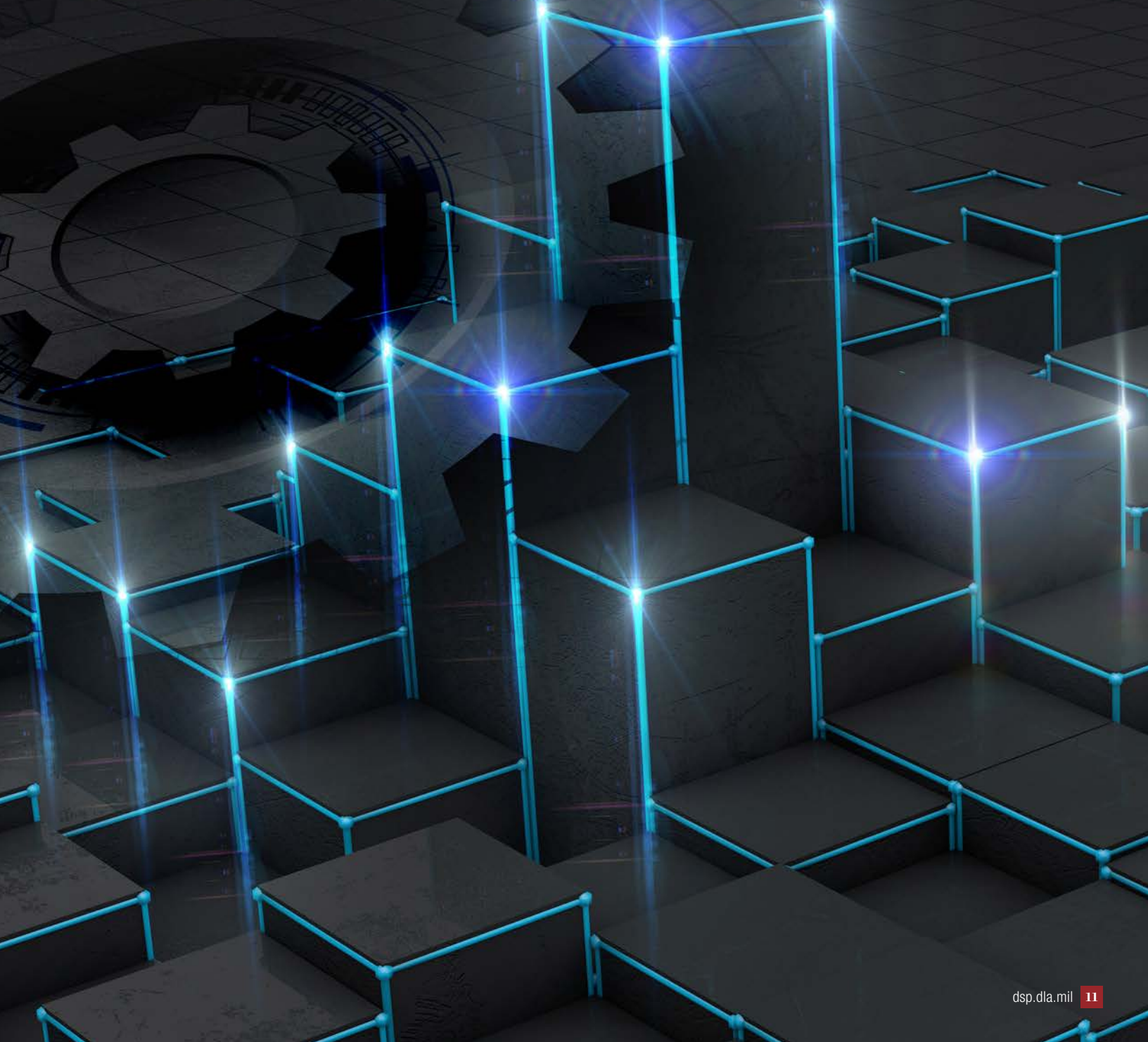


A Practitioner's Guide for Implementing DoD Parts Management

By John Becker and Donna McMurry



The DoD Parts Management Program is an integrated effort to streamline the selection of preferred or commonly used parts during the design of systems and equipment under an overarching systems engineering framework. The parts management process determines the optimum parts for an end item while considering all the factors that may affect program outcomes. Parts are the building blocks from which systems are created, and as such, they greatly impact hardware dependability and readiness. Because the reliability, maintainability, and supportability of the end item are dependent upon these building blocks, having an effective parts management program is an important contributor to defense readiness, while the nature of the process inherently provides cost savings and reduces inventory.

Parts Management Program Responsibility

The Defense Standardization Program Office (DSPO) is responsible for the DoD Parts Management Program. The DSPO has chartered the Parts Standardization and Management Committee (PSMC) to advise in the development of procedures and guidance related to parts management. The primary goal is to establish parts management best practices across DoD to increase system operational availability and reduce total ownership costs. The PSMC promotes effective parts management through information sharing between government and industry.

Standardization and Parts Management

Parts management is a mandatory standardization consideration, as stated in Department of Defense Manual 4120.24, “Defense Standardization Program Procedures,” dated September 24, 2014:

Program offices must apply standardization processes to improve parts commonality, which may include cross program technical requirements and a business case analysis. 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.

“MIL-STD-3018, Parts Management,” is a DoD standard practice document that provides requirements for the implementation of an effective Parts Management Program to support acquisition strategies and systems engineering practices. It provides performance-based parts management processes and practices that are intended to be adapted to individual program needs. The military standard and accompanying data item description (DID), “DI-SDMP-81748, Parts Management Plan,” are designed for placement on DoD contracts by acquisition program offices. “Standardization Document-19 (SD-19), Parts Management Guide,” provides additional information for defining and addressing parts management requirements in a contract.

Need for a Practitioner's Implementation Guide

Now that MIL-STD-3018 has been in use for several years, the PSMC has determined there is a need for more specific guidance to help defense industry practitioners understand how to create, document, and implement an effective parts management program in accordance with MIL-STD-3018. While many original equipment manufacturers (OEMs) have established effective parts management processes, by sharing information, others could benefit from their lessons learned, enabling standard practices. The PSMC formed an Implementation Subcommittee to develop a practitioner's implementation guide. The subcommittee has been gathering information from multiple defense providers on how they conduct their in-house parts management processes in compliance with MIL-STD-3018.

Specific Plans for the Practitioner's Guide

The primary goal of this effort is to develop and define "how to" procedures for defense industry practitioners to implement a viable parts management program that meets the requirements in MIL-STD-3018. The intention is to replicate best parts management practices across industry, not simply to reiterate the requirements included in MIL-STD-3018.

The approach of the Implementation Subcommittee involves three steps for each of the parts management elements defined in MIL-STD-3018:

- Define sample contract wording.
- Create sample processes and procedures. (Challenge: Manage differences between electrical and mechanical plans; also, detailed requirements for electrical component selection will not be addressed.)
- Implementation and checks and balances.

The procedures will address specific how-to elements, each one intended to provide a recommended generic practice for mechanical parts management.

Electronic Components Management Plan vs. Parts Management Plan

As previously noted, specific electronic component selection criteria will not be addressed in the guide, as those elements are typically embedded in each OEM's subtier processes. They include the following:

- Component application
- Component qualification

- Component quality assurance
- Component dependability
- Component compatibility with the equipment manufacturing process.

Following are the parts management elements that the selection guide will include.

Part selection baseline—parts selection list gives visibility to designers and subcontractors of the parts preferred for use.

Part selection and authorization—the management and organizational structure for standardization functions.

Obsolescence management—the plan must include procedures for obsolescence management, such as proactive obsolescence forecasting and mitigation for application part types.

Parts list or bill of materials—the plan must detail how and when the contractor submits initial and updated parts lists or bills of materials to the government, as required by contract.

Subcontractor management—the plan must describe contractor procedures for establishing and maintaining subcontractor participation to the extent necessary to ensure satisfaction of the parts management objectives.

Part and supplier quality—the plan must describe provisions for assessing part suppliers and part quality, such as statistical process control data, audits, and past performances.

Part-level documentation procedures—the documentation procedures must be detailed and consistent with the program's configuration management, logistics strategies, and total life-cycle requirements.

Substitute and alternate part procedure—the process for the management, definition, and documentation of substitute and alternate parts.

Replacement process—the contractor must ensure that the program is consistent with the intent and application of systems engineering disciplines (configuration management, quality, logistics, etc.).

Customer-contractor teaming—the parts management plan must address customer teaming to allow for continued insight into processes for program verification.

Counterfeit parts—address the detection, mitigation, and disposition of counterfeit parts, including electronic, electrical, and mechanical parts. SAE International's AS5553 should be used as guidance for electronic parts. AS6174 should be used as guidance for mechanical parts.

Lead-free electronic parts—the parts management plan must address the process to manage the risk associated with using lead-free parts. TechAmerica GEIA-STD-0005-1 may be used as guidance for lead-free electronic parts.

Additional elements—the process for addressing those additional elements, as identified by contract, must be defined.

While the Implementation Subcommittee has a ways to go before the Practitioner's Implementation Guide is published, here is an example of the type of requirement that may be included for contract wording.

EXAMPLE

The contractor shall establish and maintain a Parts Management Program in accordance with MIL-STD-3018 for all new designs or modified equipment. This program will ensure that the use of parts meets the contractual requirements, reduces proliferation of parts within and across DoD weapons systems and equipment through standardization, enhances reliability and supportability to meet material readiness objectives, and reduces total-life-cycle costs. Also, 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 Data Item Description DI-SDMP-81748 and deliver the plan in accordance with the Contract Data Requirements List (DD Form 1423).

Summary

A mandatory standardization consideration, parts management is an effort to select preferred parts during the design of weapon systems and equipment to enhance standardization, reliability, and supportability and reduce total ownership costs. MIL-STD-3018 and its accompanying DID provide a contractual tool that delineates parts management requirements. SD-19 offers helpful guidance for defining and addressing parts management in acquisition contracts. The parts management implementation guide for practitioners being developed now is intended to clarify and share effective processes of applying MIL-STD-3018 requirements to implement a company's parts management program. Once the guide is completed, the PSMC's Implementation Subcommittee plans to make it available online for the benefit of all interested parts management practitioners.

About the Authors

John Becker is working at United Technologies Aerospace Systems as engineering support for corporate commodity teams. He is also currently supporting a corporate-wide effort in mechanical parts standardization and has been actively involved in the PSMC since the mid 1990s. Mr. Becker has an extensive background in component engineering, engineering standards, quality engineering, and supplier quality.

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