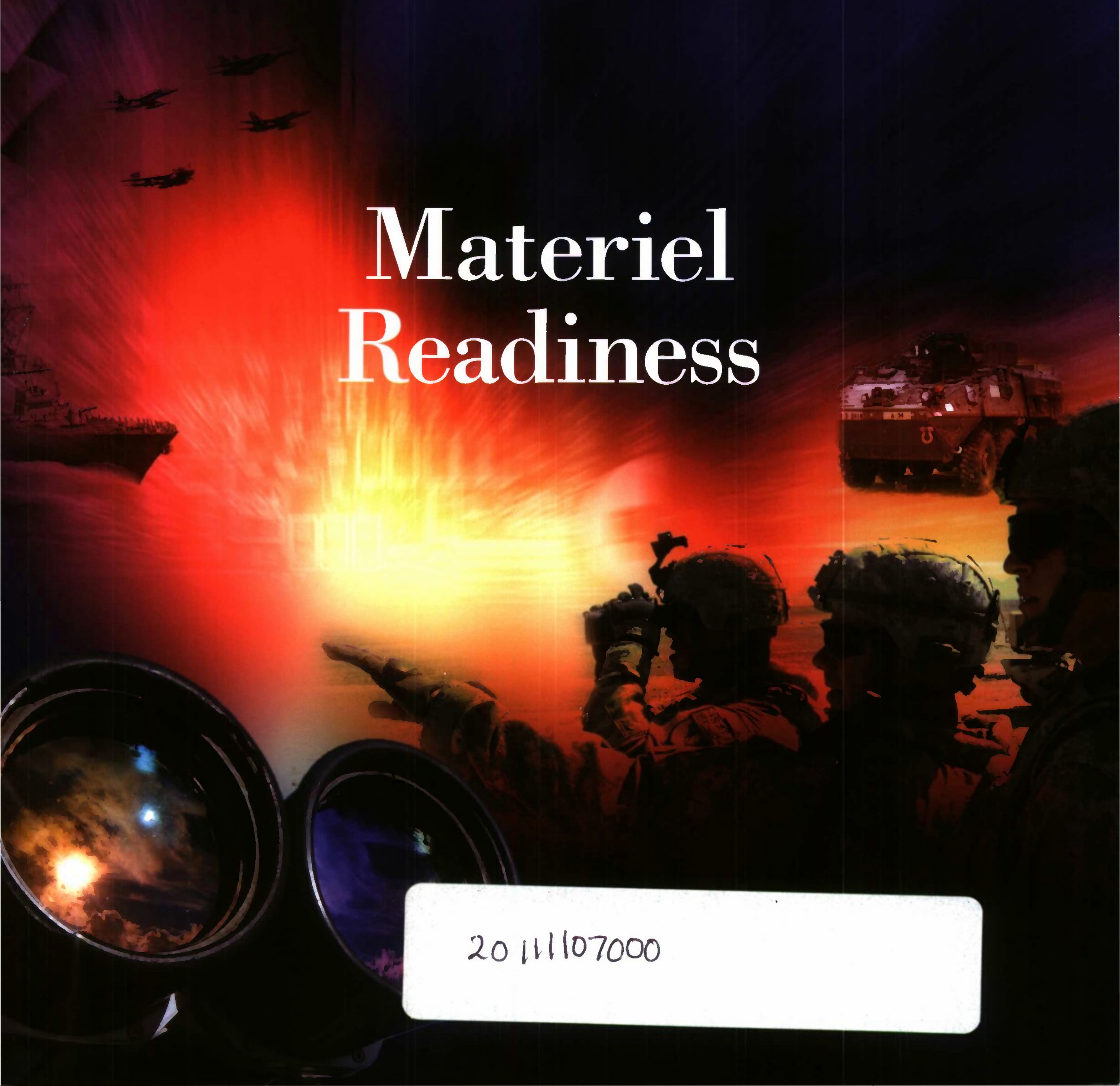
Defense Standardization Program
Journal
July/September 2011

Materiel Readiness



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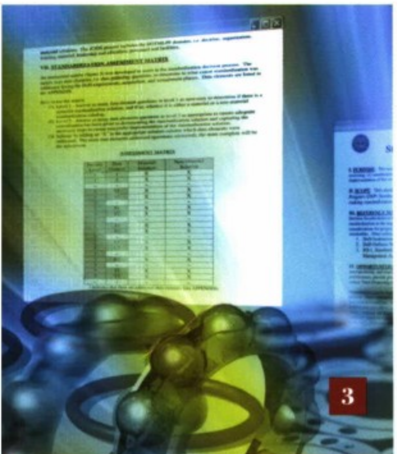

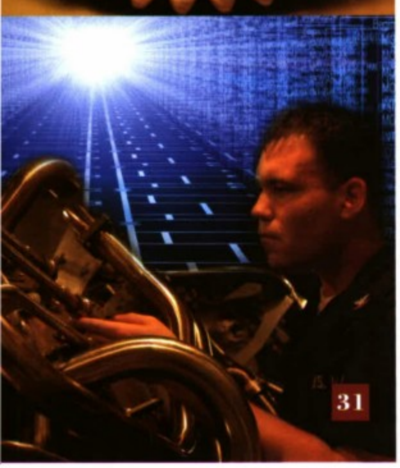

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Director's Forum

Five Myths about MilSpec Reinstatement

1. DoD is about to reinstate a bunch of MilSpecs to replace non-government standards adopted during acquisition reform.

This myth stems from a decision last year by the Defense Standardization Council (DSC)—a senior-level group chaired by the Deputy Assistant Secretary of Defense for Systems Engineering with senior representatives from the military departments and several defense agencies—to assess whether the DoD requirements in key systems engineering disciplines, such as quality, reliability, maintainability, configuration management, manufacturing, logistics, and a few others, were being adequately addressed at an enterprise level. Several working groups are now assessing the details, and one possible outcome may be the reinstatement (with significant updates) of a few military standards. In some cases, it may result in a decision to replace an adopted non-government standard with a government standard, but if that happens at all, it will likely be the reinstatement of less than a dozen government standards. And, of course, another likely outcome may be adopting existing, revised, or new non-government standards.

The truth is DoD relies heavily on standards and specifications developed by the private sector. Nearly one-third of the documents listed in the ASSIST Database (the official repository of DoD specifications and standards) are non-government standards. Over 75 percent of the standards listed in the DoD Information Technology (IT) Standards Registry, which are mandated for use in DoD to ensure interoperability of IT systems, are non-government standards. Non-government standards are cited by the thousands in our technical data packages, cataloging information, contracts, technical manuals, policy documents, and elsewhere. The idea that DoD might reinstate a significant number of MilSpecs to replace non-government standards currently in use would not make good technical, economic, or practical sense.

2. The non-government standards adopted by DoD are inadequate and unusable.

The overwhelming majority of non-government standards have satisfied DoD requirements for many decades. If there are inadequacies, the usual remedy is to ask the non-government standards technical committee to make changes to the standard, which they are generally willing to do. In some cases, the inadequacy of a non-government standard may have been the result of the philosophy adopted by DoD during MilSpec Reform in the mid- to late 1990s that requirements should be stated in such a way as to allow contractors broad latitude to meet those requirements. In some cases, requirements were written more as guidance than as a requirement that could be placed on contract. Our policy, as well as our preference, remains one of stating requirements in performance terms to the greatest extent practical. But because we have gained more experience with writing performance requirements, it may be

Gregory E. Saunders
Director
Defense Standardization Program Office

necessary to revisit some of those requirements and rewrite them to ensure satisfactory results.

3. DoD is retreating from the National Technology Transfer and Advancement Act and Office of Management and Budget Circular A-119, which establishes policies on using voluntary standards.

DoD continues to be the leader in the federal government in the use of non-government standards. (We prefer the term "non-government standard" to "voluntary standard" but we are referring to essentially the same thing.) In its August 2010 report on federal agency use of non-government standards, the National Institute of Standards and Technology indicated that in FY09, DoD led all federal agencies, replacing 112 government specifications and standards with non-government standards. We remain firmly committed to the policy principles of these government-wide policies, and we demonstrate it in our daily practices.

4. The process for reinstating canceled MilSpecs and MilStds is undefined.

The process for reinstating canceled MilSpecs and MilStds is clearly defined in DoD 4120.24-M, *Defense Standardization Program Policies and Procedures*. Simply stated, the process is as follows:

- A canceled MilSpec can be reinstated by a DoD Preparing Activity with approval from the Lead Standardization Activity and if no "essential" comments are received during coordination. Note that we differentiate between specifications (which generally describe products and processes) and standards (which generally describe engineering disciplines).
- A canceled MilStd can be reinstated by a DoD Preparing Activity if approved by the Lead Standardization Activity, if no "essential" comments are received during coordination, and if the cognizant Standardization Executive for the Preparing Activity concurs.
- If the DSC made a joint decision about canceling a document, then the DSC must approve reinstatement. A list of these very few documents is on our website: www.dsp.dla.mil, under Policy, Other DSP Guidance.

Reinstatement of a canceled MilSpec or MilStd is a rigorous process, but that's a good thing.

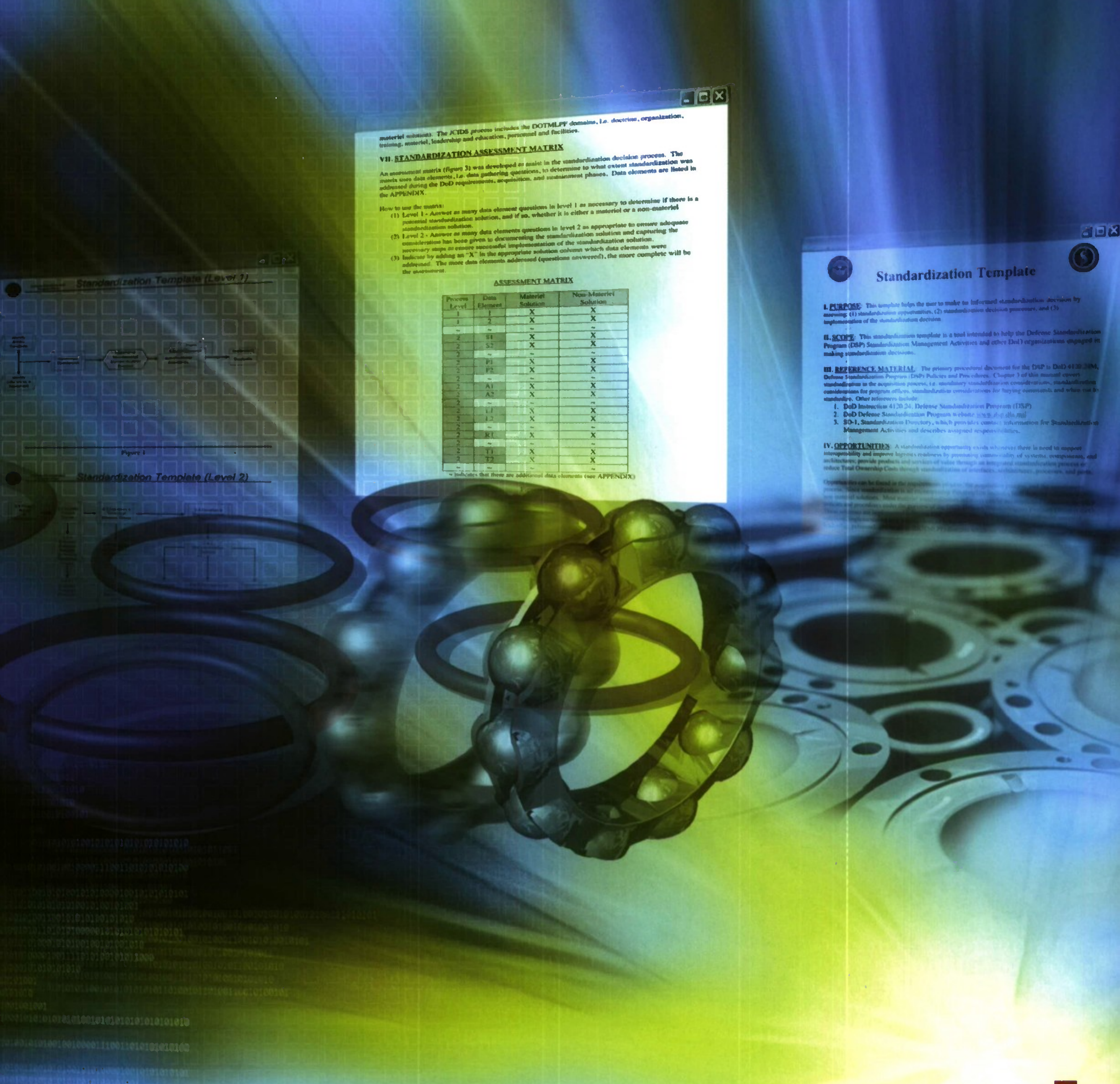
5. It's cheaper to develop and maintain a MilSpec, and once the MilSpec is completed, it's free.

Development of technical documentation of almost any sort is a time-consuming, exacting process requiring research, validation of findings, coordination with peers, careful composition, and so on. This is true whether the document being produced is a military document or a non-government standard. MilStds are not free. The subject matter experts devoting time to research, validation, coordination, and composition do not work for free. DoD, and the American taxpayer, is fortunate to have some of the world's brightest scientists, engineers, and other technical experts working for us. When they spend their time to develop the technical requirements that eventually become part of a MilStd, it may be transparent because they already work for us. But it is definitely not free. Similarly, the time spent by peers to review, comment on, and develop consensus on these technical documents adds up to many hours of work. The infrastructure needed to maintain records and configuration control, provide the database, and oversee the policies and procedures costs money. It is a principle of technical work developed by public employees that the public has paid for the work, therefore the resultant material should be made available without additional charge. This is not the same as saying it is free—it is just provided to the public without charging again. Yes we pay for non-government standards, but we also pay for MilSpecs. There is no free lunch.

The Standardization Template

A Tool for Assessing Standardization Opportunities

By Tom Ridgway



The standardization template is a tool intended to help the DSP community and other DoD organizations engaged in making standardization decisions. The template helps the user make an informed standardization decision by providing a framework for assessing standardization opportunities and an associated decision process.

Background

The standardization template was developed by DSPO at the request of the Defense Materiel Readiness Board (DMRB). The DMRB—cochaired by the Assistant Secretary of Defense for Logistics and Materiel Readiness and the Director for Logistics, J4, Joint Staff—wanted to identify and exploit standardization opportunities that would improve DoD materiel readiness. The objectives were as follows:

- Identify similar functions being accomplished using dissimilar equipment:
  - Determine how to identify.
  - Develop a list of questions to ask.
- Identify differences in equipment:
  - Analyze what differences exist.
  - Analyze why there are differences (functional requirement, deployment concept, support concept, acquisition strategy, other significant issues and reasons).
  - Determine who "owns" the differences.
- Harmonize and standardize:
  - See whether differences can be harmonized.
  - Evaluate the standardization opportunity (difficulty, tradeoffs, payoffs).
- Develop appropriate documentation to effect standardization decisions. Examples of documentation that may be needed are
  - a specification or standard,
  - an acquisition plan,
  - an operational plan,
  - a support concept, and
  - mandatory direction from an appropriate source, such as a DoD directive or the Defense Federal Acquisition Regulation Supplement.
- Implement:
  - Get appropriate "direction" issued.
  - Determine if additional mechanisms are needed.
- Evaluate:
  - Determine if the standard equipment is meeting the operational requirement.
  - Determine if the direction and enforcement mechanisms are working.

The DSPO worked with the Joint Expeditionary Basing Working Group (JEBWG) to develop the initial template based on lessons learned and the JEBWG's repeatable process. The repeatable process has four phases: (1) identify the standardization candidates, (2) analyze the candidates to establish a nomination list, (3) further analyze the candidates and forward a recommended list of candidates to the services for approval, and (4) work on the candidates on the approved equipment list. In some cases, an integrated product team is established.

The template was further refined by working with the DMRB Working Group and conducting a virtual beta test of the template using body armor as the standardization opportunity.

Template Structure

The template structure has the following components:

- Section I. Purpose
- Section II. Scope
- Section III. Reference Material
- Section IV. Opportunities
- Section V. Process Levels
- Section VI. Standardization Solutions
- Section VII. Standardization Matrix
- Section VIII. Implementation
- Appendix—Data Elements.

The first three components are self-explanatory. The remaining components are explained in the following subsections. The entire standardization template can be found on the DSP website: www.dsp.dla.mil.

OPPORTUNITIES

A standardization opportunity exists whenever there is a need to support interoperability and improve logistics readiness by promoting commonality of systems, components, and architectures; to provide products and services of value through an integrated standardization process; or to reduce total ownership costs through standardization of interfaces, architectures, processes, and parts.

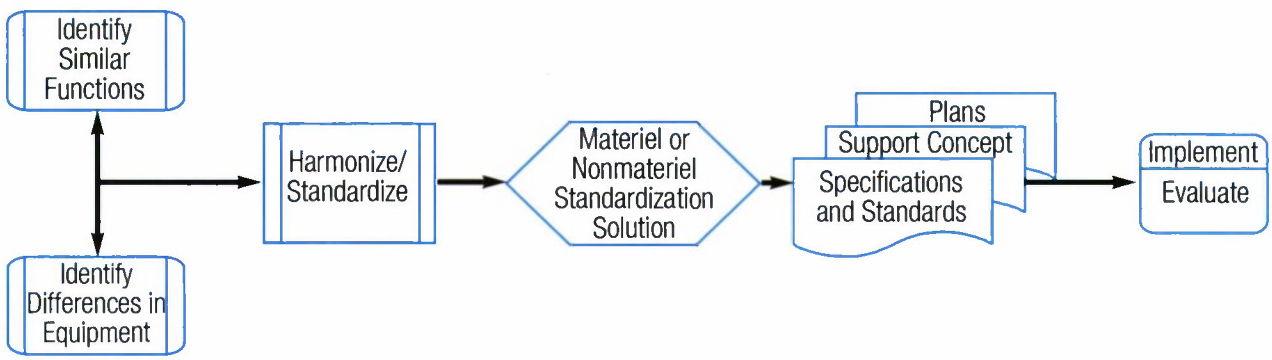
Opportunities can be found in the requirements process, the acquisition process, and the sustainment process. Because standardization is all-encompassing, this template includes both materiel solutions and nonmateriel solutions. Most materiel standardization solutions can be accomplished following the DSP policies and procedures under the purview of DSPO. These solutions are implemented using the DSP infrastructure. For nonmateriel and some materiel solutions, implementation may require changes to the doctrine, organization, training, materiel, leadership, personnel, and facilities (DOTMLPF) domains, which are outside the purview of DSPO.

PROCESS LEVELS

The standardization template has two levels:

- *Level 1.* Level 1 encompasses the initial steps of identifying a standardization opportunity, categorizing the potential standardization solution as a materiel solution or a nonmateriel solution, and gathering general data needed to evaluate the opportunity. Figure 1 depicts the Level 1 process flow.

Figure 1. Level 1 Process Flow



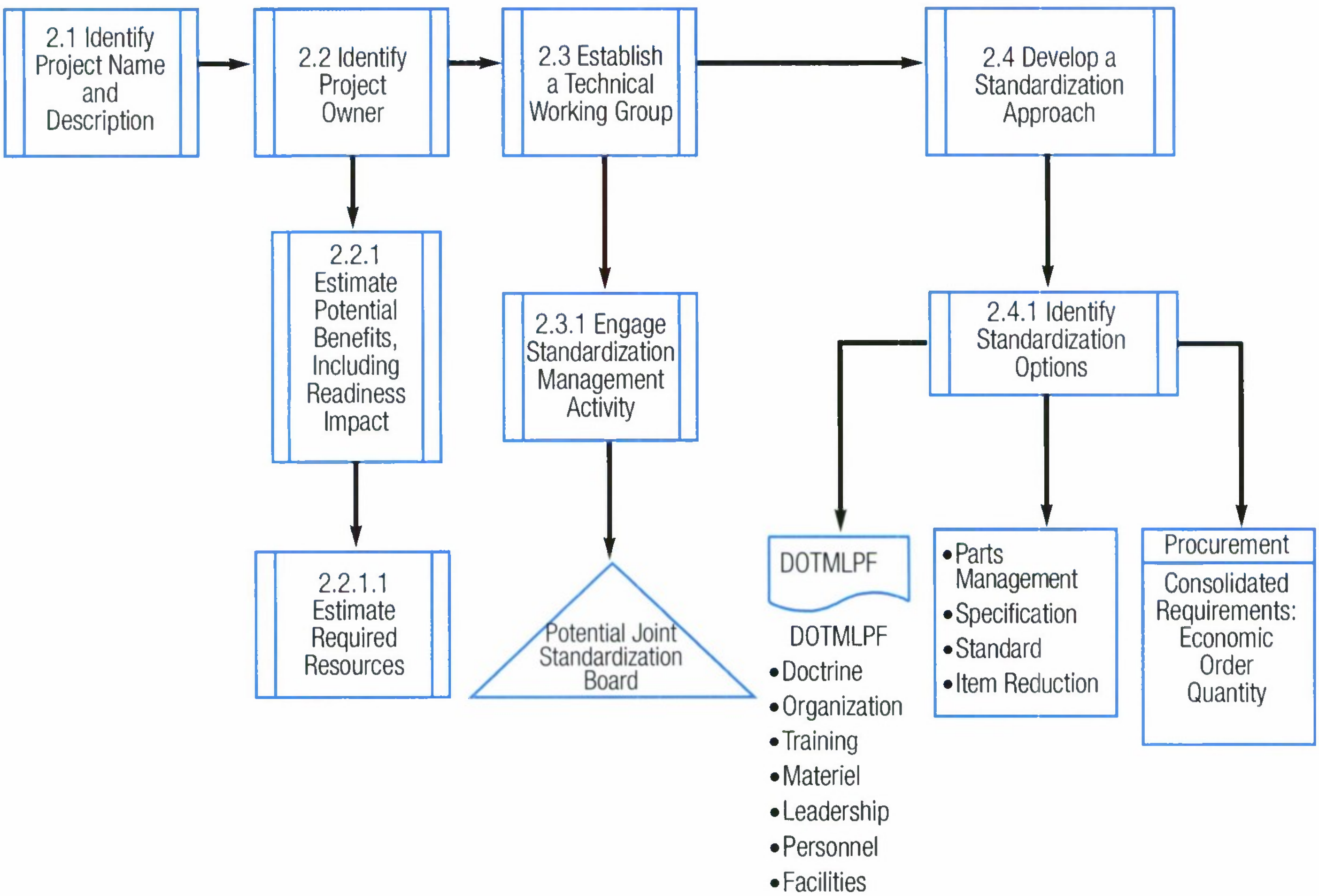
- *Level 2.* Level 2 encompasses the fundamental steps of gathering pertinent data associated with standardization opportunities within the requirements, acquisition, and sustainment processes. More specifically, it includes data elements considered necessary to (1) document the standardization project, (2) capture the potential benefits, and (3) evaluate the standardization options. Figure 2 depicts the Level 2 process flow.

STANDARDIZATION SOLUTIONS

The template categorizes standardization solutions as materiel solutions and nonmateriel solutions. Materiel solutions are solutions that fall under the purview of DSPO programs designed to support interoperability and improve logistics readiness by promoting commonality of systems, components, and architectures:

- Parts management program
- DSP documents
- DSP international standardization program
- Item reduction program
- Joint standardization boards.

Figure 2. Level 2 Process Flow



Also considered a materiel solution is the use of the procurement practices of consolidated requirements and economic order quantity buys.

Nonmateriel solutions are solutions that relate to the Joint Capabilities Integration and Development System (JCIDS) process. The JCIDS process supports the acquisition process by identifying and assessing capability needs and associated performance criteria to be used as a basis for acquiring the right capabilities. The JCIDS process considers whether a solution to a potential operational gap requires the development of a physical system (a materiel solution) or a procedural or training-based solution (a nonmateriel solution). The JCIDS process includes the DOTMLPF domains.

STANDARDIZATION MATRIX

DSPO developed an assessment matrix to assist with the standardization decision process. The matrix uses data elements, i.e., data-gathering questions, to determine the extent to which standardization was addressed during the DoD requirements, acquisition, and sustainment phases. Data elements are listed in the template's appendix.

IMPLEMENTATION

After the matrix is completed, a description of the standardization opportunity (or issue) and proposed resolution can be developed. The description should include the following details:

- Applicable process—requirements development, acquisition, or sustainment
- Type of solution—materiel or nonmateriel
- Applicable data element category—policy/doctrine, acquisition, life cycle, readiness, training, etc.—in which issues have been identified and require resolution
- Requisite actions to resolve the outstanding standardization issue—senior-level decision or attention, resources, change in policy or practice, materiel solution, and so on.

After assessing the standardization opportunity and potential standardization solutions, the potential outcome may be a DSP program solution, a change in the DOTMLPF domains, the formation of a working group, the development of a business case, or the development of a standardization case study.

A business case is used to justify additional resources, if needed, to implement the standardization solution. The business case should include the following elements:

- Description of the background and issue
- Description of the proposed materiel or nonmateriel solution
- Benefits, for example, cost savings or cost avoidance; improved readiness, reliability, or sustainment; or streamlined process
- Expected outcome and deliverables
- Funding and resources required to implement the solution
- Key stakeholders
- Priority and timeline as appropriate
- Impact if the solution is not implemented.

A case study is used to capture the benefits of standardization and lessons learned. The case study should address the following:

- Background and focus of the case study
- Problem and opportunity
- Solution and constraints
- Approach
- Outcomes
- Investments and payoffs
- Lessons learned

- Current status
- Future efforts.

APPENDIX—DATA ELEMENTS

Level 1

The data elements associated with Level 1 are answers to general questions needed to determine if the standardization opportunity is a viable candidate and if the potential solution is worth pursuing:

- How was the candidate identified as a standardization opportunity?
- Was there a decision criterion used to identify the candidate? If so, please describe it.
- Was the standardization decision documented?
- Does the standardization opportunity have a sponsor or requisite leadership support?
- Will the standardization opportunity be a DoD/joint effort or a single service effort?
- Was the decision to standardize based on commonality and the agreement to standardize on technical requirements (i.e., requirements development phase)?
- Was the decision made to consolidate common requirements in order to consolidate procurement contracts and take advantage of economic order quantities (i.e., acquisition phase)?
- For materiel standardization solutions, was consideration given to the DSP programs (i.e., parts management, DSP specifications or standards, item reduction, or joint standardization boards)?
- For nonmateriel solutions, was consideration given to requisite changes to the DOTMLPF domains?
- What is the expected outcome (a DSP product, a change within a DOTMLPF domain, formation of a working group, a business case, a case study)?

Level 2

The data elements associated with Level 2 are answers to detailed questions needed to evaluate the standardization project and to assess the standardization solution. The applicability of a data element depends on the standardization opportunity and the proposed solution. DSPO has grouped the data elements into six categories. Table 1 lists them, along with the questions intended to elicit the needed answers.

Summary

The standardization template is a useful tool to help assess a standardization opportunity, identify a potential standardization solution, and develop a standardization approach. However, there are certain prerequisites for success: (1) a sponsor, which provides re-

Table 1. Level 2 Data Elements

Category	Questions
Standardization project	Has the standardization opportunity been fully described and given a project name for identification purposes? Has a project owner been assigned? Will a working group need to be formed? What is the standardization approach? What are the standardization options? Have potential benefits been estimated to support the project? Will additional resources be required? Has the appropriate standardization management activity been engaged? Is there a potential for a joint standardization board?
Policy, doctrine, and procedures	Is DoD policy current and sufficient? Is joint guidance and doctrine current and sufficient? Is there a need for a joint proponent? Are joint procedures/processes documented?
Acquisition	Does the acquisition strategy include a standardization approach? Does a U.S.-ratified international standardization agreement, such as a North Atlantic Treaty Organization Standardization Agreement, exist that is applicable? Must the system or subsystem interoperate with other systems, subsystems, or equipment? Must form, fit, function, or interface be defined to permit interoperability or connectivity between discrete items? Is uniform configuration necessary for ease of operations or safety? Is design control necessary because predictable performance is an essential requirement? Do organic logistics support considerations demand that form, fit, function, or interface be identical to replace or substitute for an equivalent item (interchangeability)? Would commonality improve training for operations, maintenance, or repair? Would research and development costs, engineering time, or procurement time be reduced?
Life-cycle requirements and operating and support costs	What item, process, practice, criteria, or principles are being addressed? Was action taken to determine if a standard unit was available? Is there a program/project manager's office involved in the standardization decision? Is there an impact on the acquisition plans? Is there an impact on the maintenance or sustainment plans? Were the DSP programs considered as materiel solutions?
Readiness	What is the impact on materiel readiness (e.g., materiel availability, materiel reliability, operating and support cost, and mean downtime)?
Training	Will additional fielding or maintenance training be required? For fielded equipment, will the program-of-record office take responsibility for providing any additional training, if required?

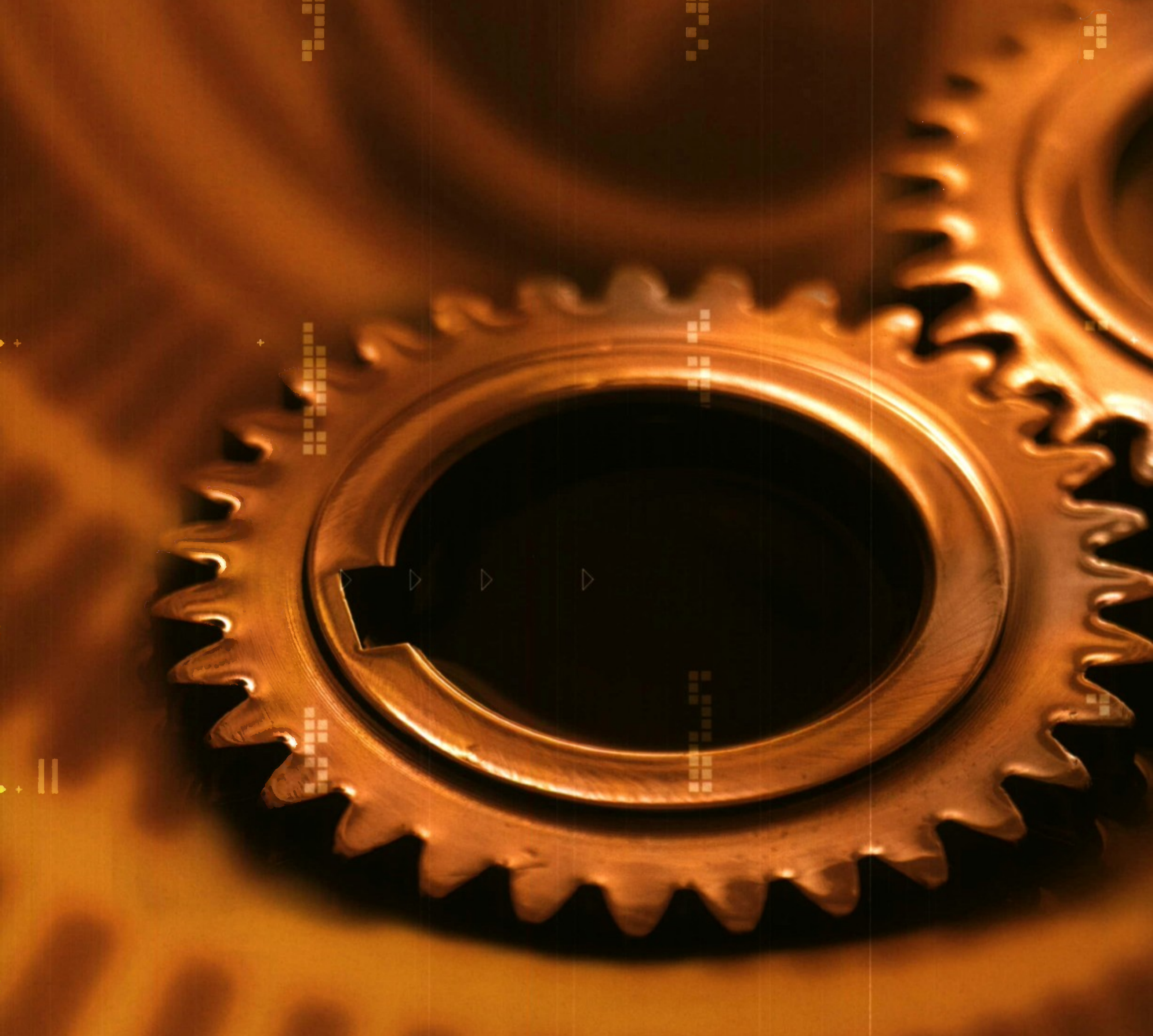
quirements, priority, and oversight; (2) a project owner, which is accountable for implementation; and (3) sufficient resources to complete the project. Without these, success will be limited.

About the Author

Tom Ridgway is a member of the DSPO staff. He serves as the program manager for the DoD joint standardization boards and has more than 40 years of engineering and standardization experience working for DoD.

A Parts Management Approach to Reducing the Risk of Non-Authentic Parts

By Bob Ricco



As the supply chain supporting the military and defense industries grows larger and more complex, the appearance of parts of questionable authenticity is an all-too-common occurrence. According to the Department of Commerce,

> the rise of counterfeit parts in the supply chain is exacerbated by demonstrated weaknesses in inventory management, procurement procedures, recordkeeping, reporting practices, inspection and testing protocols, and communication within and across all industry and government organizations.[1]

The Government Accountability Office notes that

> DoD draws from a large network of global suppliers and manages over 4 million different parts at a cost of over $94 billion; therefore, counterfeit parts can enter its supply chain. Almost anything is at risk of being counterfeited including fasteners used on aircraft, electronics used on missile guidance systems, and materials used in body armor and engine mounts. Counterfeit parts have the potential to cause a serious disruption to DoD supply chains, delay ongoing missions, and even affect the integrity of weapon systems. Counterfeits are not limited to the DoD supply chain and exist in other government entities, such as the National Aeronautics and Space Administration and the Department of Energy, as well as in many commercial settings. The systems at risk are diverse including: software, commercial aviation, automotive parts, and consumer electronics all of which can threaten the safety of consumers.[2]

Unfortunately, counterfeit parts are only a subset of a larger group of parts of suspect authenticity. Non-authentic parts are common in the electronics supply chain, including distributors, brokers, and other parts supply entities. In many cases, the parts are not "counterfeit" in the sense that they are illegal copies of parts; instead, they may be parts whose pedigree has been lost due to multiple ownership or genuine parts that may have entered the supply chain through uncontrolled sources. In any event, such parts can result in degraded performance, reliability, and availability of critical systems. Therefore, it is crucial that all defense contractors take steps to prevent non-authentic parts from entering the supply chain. One important step is to adopt the process specified in a new military standard—MIL-STD-3018, "Parts Management"—authored by the DSPO-chartered Parts Standardization and Management Committee (PSMC).

The MIL-STD-3018 Parts Management Process

MIL-STD-3018 addresses the issues of parts management as a necessary discipline in the design, development, and acquisition of systems for DoD applications. The new standard, which provides a set of design requirements, seeks to reduce the number of unique, specialized, and defined problem parts used in a system (or across systems) in order to enhance standardization, reliability, maintainability, and supportability. It also seeks to mitigate occurrences of parts obsolescence due to Diminishing Manufacturing Sources and Material Shortages (DMSMS). These inherent benefits result in increased operational and logistics readiness, enhanced interoperability, reduced logistics footprint, and reduced total ownership cost. Effective parts management is the cornerstone that helps program managers achieve their objectives.

MIL-STD-3018 defines requirements based on parts management best practices. The standard addresses the following specific areas:

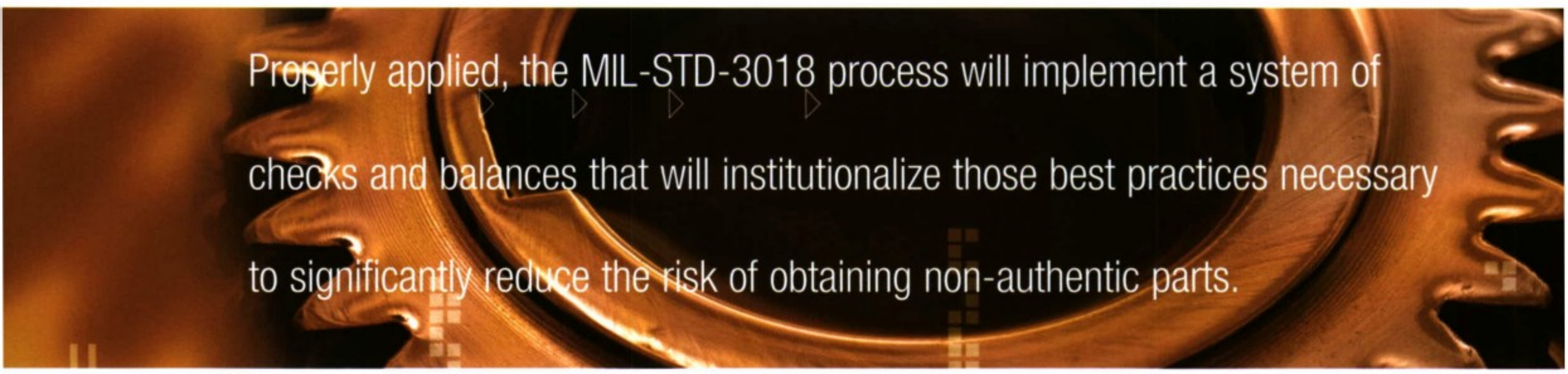
- Counterfeit parts
- Customer-contractor teaming
- Lead-free parts
- Obsolescence management
- Part and supplier quality
- Part level documentation procedures
- Parts list or bill of materials
- Parts selection and authorization process
- Parts selection baseline
- Subcontractor management
- Substitute and alternative part procedures.

The risks related to counterfeit parts and lead-free parts are key topics in the standard because these risks are of high concern in the supply chain. However, this article looks at the broader issues of non-authentic parts. Of course, the methods used to prevent the introduction of non-authentic parts are much the same as those used for counterfeit parts.

One of the principal advantages of using the MIL-STD-3018 approach to parts management is that it advances consistency and discipline in the parts management process. This is particularly important in the area of non-authentic parts. Some of the major drivers introducing non-authentic parts into the supply chain are cost, schedule, and obsolescence. These issues are a problem when the procedures used by engineering, design, and procurement teams are not specifically designed to prevent behaviors that result in lapses in supply chain integrity. MIL-STD-3018 addresses the areas of parts selection and authorization and obsolescence management.

MIL-STD-3018 also contains requirements to have two plans, one addressing DMSMS management (in accordance with TechAmerica Standard 0016, "Diminishing Manufacturing Sources and Material Shortages"), and the other addressing the avoidance, detection, mitigation, and disposition of counterfeit electronic parts (in accordance with SAE International's standard AS5553, "Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition"). AS5553 focuses on the following areas:

- Counterfeit electronic parts control plan
- In-process investigation
- Material control
- Parts availability
- Purchasing
- Purchasing information
- Reporting
- Verification of purchased product.



Incorporating these requirements into MIL-STD-3018 significantly strengthens it in the area of non-authentic parts and provides an effective system to avoid them. It also makes MIL-STD-3018 a powerful tool for establishing the discipline necessary to mitigate the risks of non-authentic parts entering the aerospace supply chain. Properly applied, the MIL-STD-3018 process will implement a system of checks and balances that will institutionalize those best practices necessary to significantly reduce the risk of obtaining non-authentic parts. In addition, if MIL-STD-3018 is implemented using the approach outlined in Electronic Industries Alliance Standard 4899, "Standard for Preparing an Electronic Components Management Plan," the implemented process can be assessed by a third-party registrar as additional insurance of proper implementation and demonstration to customers of the adequacy of the system. The plans outlined in SAE AS5553 and TechAmerica Standard 0016 also can be similarly verified.

There is no substitute for vigilance in the drive to protect the DoD supply chain from non-authentic parts. Human errors in the procurement process, failure to follow established procedures to meet pressing business needs, and the rapid ability of parts counterfeiters to adapt will continue to challenge our parts management systems.

Conclusions

Strong measures are required to keep the DoD supply chain free of non-authentic parts, whether from counterfeiters or other less obvious sources. As part of those measures, a MIL-STD-3018 parts management plan can be a solid base upon which to begin to improve a parts management system. The standard addresses the issue of non-authentic parts as well as the issues traditionally associated with parts management. PSMC will update and improve the standard and the system as the military and defense supply chain demands.

[1]Department of Commerce, *Defense Industrial Base Assessment: Counterfeit Electronics*, January 2010.

[2]Government Accountability Office, *Defense Supplier Base: DoD Should Leverage Ongoing Initiatives in Developing Its Program to Mitigate Risk of Counterfeit Parts*, GAO-10-389, March 2010.

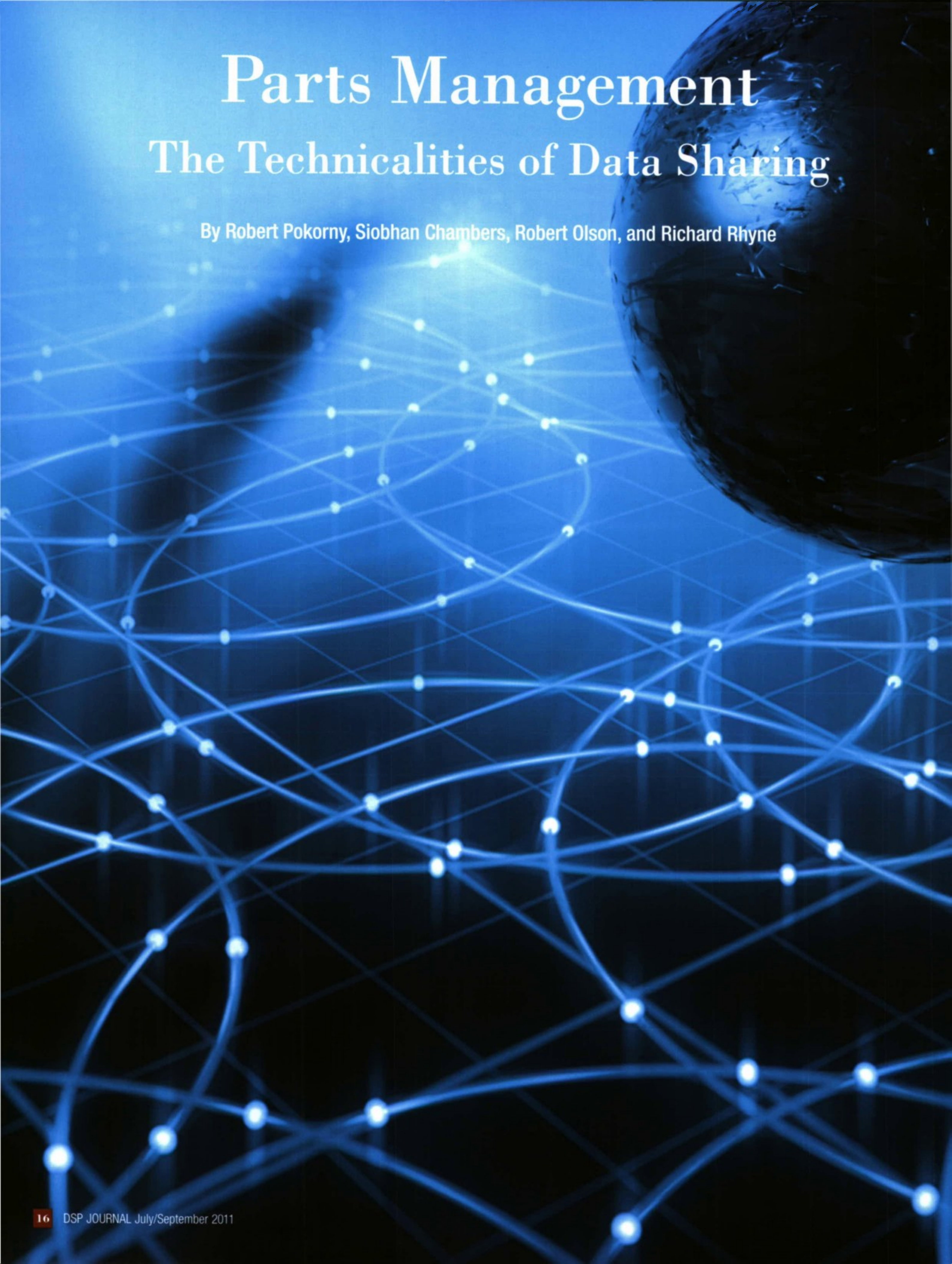
About the Author

Bob Ricco is working in mission assurance at Northrop Grumman. He has extensive experience in manufacturing, reliability, quality process development, and engineering management.

Parts Management

The Technicalities of Data Sharing

By Robert Pokorny, Siobhan Chambers, Robert Olson, and Richard Rhyne



The goal of parts management within DoD is to minimize the total life-cycle cost of supplying consumable and repairable parts to maintain weapon system and infrastructure readiness. In support of that goal, the Defense Logistics Agency (DLA) sponsored a pilot project, under the Weapon System Sustainment Program, to explore whether the sharing of data on commodity parts between DoD and its major weapon system suppliers could lead to better parts management and to reduced life-cycle costs. The pilot project focused on two groups of commodity items: connectors and fasteners. DLA assembled a study team—composed of LMI, XSB, Inc., Northrop Grumman Electronic Systems, and L-3 Communications Systems–West—to investigate the benefits of sharing technical part data for these two commodities.

The team's approach was to analyze the business case for sharing part information. Northrop Grumman and L-3 Communications provided their internal data about parts in these commodities, and XSB provided data mining and data enhancement capabilities. In addition, the study team enlisted the aid of DLA Land and Maritime, DLA Logistics Information Service, and the group at U.S. Army Aviation and Missile Research Development and Engineering Center (AMRDEC) that addresses Diminishing Manufacturing Sources and Material Shortages (DMSMS) to review and offer feedback on assumptions and results.

Hypothesis

The study team believed that the lack of shared part information between DoD and industry has increased part proliferation, reduced the opportunity for part standardization, negatively affected part availability, and caused an overall cost increase to part sustainment. The team hypothesized that sharing of data for commodity parts across the defense supply chain would benefit both DoD and its industrial suppliers by revealing the use of identical parts in different applications and the relative strength of the supply chain for different parts with similar characteristics. The team also hypothesized that shared knowledge would improve decisions about part selection in new applications and point to places where the elimination of duplicate parts could offer benefits of scale in part sustainment. Together, these benefits could result in significant cost avoidance for both the participating original equipment manufacturers (OEMs) and DoD.

Approach and Results

The approach taken to demonstrate the benefits of integrated parts management across the defense supply chain was to focus on two product domains, connectors and fasteners, and to collect information about the usage of these products from DLA, Northrop Grumman, and L-3 Communications. Both Northrop Grumman and L-3 Communications agreed to share most of their internal data about the connectors and fasteners in their supply chains. The data shared included manufacturers' names and part numbers, attributes of these parts, and aggregated purchases of these parts over the last 3 years. Both companies thought that sharing this information would not be detrimental to their internal operations and would give them a better overall picture of the supply chain for these items. Of course, the companies did not share information such as specific program usage.

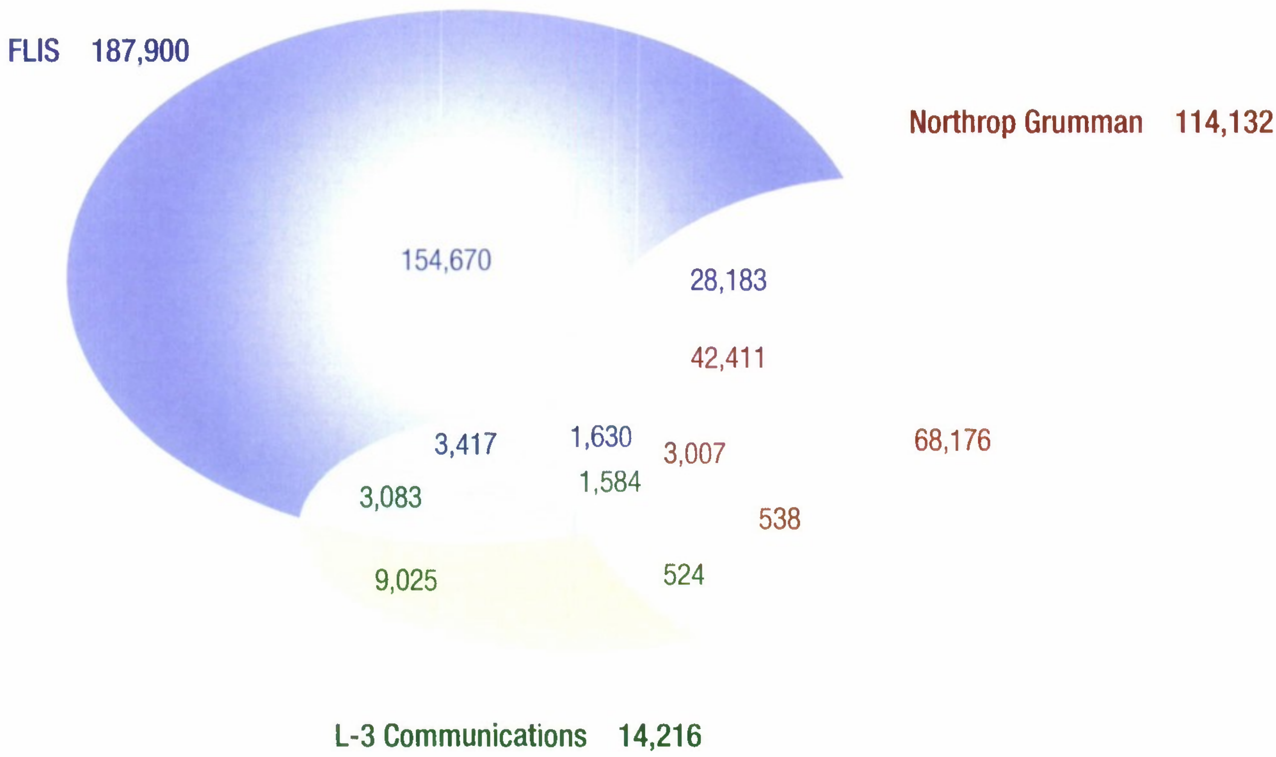
The team also assembled part data on connector and fastener national stock numbers (NSNs) from the Federal Logistics Information System (FLIS). Those data included reference part numbers for each NSN—the Commercial and Government Entity (CAGE) codes and part numbers registered as sources for the NSN—and technical characteristics cataloged for each NSN based on the Federal Item Identification Guides. In addition, the team obtained procurement history for these NSNs from DLA's Enterprise Business System.

Once data from the OEMs and DLA were aggregated for connectors and fasteners, the team identified parts from the different data sources that were identical (that is, parts with the same manufacturer and part number). This required recognizing when different versions of a manufacturer's name represented the same manufacturer and different versions of the part number referred to the same part. (The optional use of dashes and spaces in part numbers precludes looking for just exact matches of part numbers.) This step used XSB technology for manufacturer name and part number standardization. The result was a unique identifier (ID) for a part that could be linked to all instances of that part in OEM and DLA data.

Figure 1 presents the results of this process for connectors. It is a Venn diagram showing the overlaps in the inventories of connector parts from DLA, Northrop Grumman, and L-3 Communications. Notice that counts are different for matching parts in each organization's database. Thus, 28,143 NSNs match to 42,411 Northrop Grumman parts but do not match to any L-3 Communications parts. This is because the same item from the same manufacturer can be associated to different NSNs and Northrop Grumman internal part numbers; the relationship is not one-to-one. A similar situation exists for each of the segments in the diagram. For example, 1,630 NSNs are common to the FLIS, Northrop Grumman, and L-3 Communications catalogs. This is equivalent to 3,007 Northrop Grumman parts and 1,584 L-3 Communications parts.

After matching part numbers to the unique IDs, the team aggregated all of the attribute data available for those parts. The sources of attribute data were FLIS material requirement codes, OEM attribute data, attributes inferred from the part number structure defined in specifications and standards, attributes available from commercial manufacturers, and attributes available from distributor websites. Attribute data from the five sources were then standardized to a set of primary attributes agreed upon through a consensus

Figure 1. Number of Common Connectors in the FLIS, Northrop Grumman, and L-3 Communications Catalogs



among DLA, XSB, and the OEMs. These primary attributes were considered the most important attributes for describing the parts in the part selection process. Different primary attributes were defined for connectors, bolts and screws, nuts, and washers. This process required mapping and standardizing alternate forms of attributes and their values to the standard primary attributes.

Table 1 shows the problem of normalizing attributes. The matrix is based on the top 20 attributes for connectors populated in each data source. Each of the five data sources had 20 attributes, but the total was less than 100 attributes because many of the attributes overlapped across various sources. Highly populated attributes in one data source are not necessarily highly populated in other data sources. The first row in the matrix shows that 13 attributes in Northrop Grumman data are highly populated but are not highly populated in any other source. Likewise, the second row demonstrates that 10 attributes are highly populated in the L-3 Communications data but not in any other source. As illustrated by the last row, only 1 connector attribute is highly populated across all sources.

The study team's approach enabled it to develop a common parts database that related the unique ID for each part to all the parts from the OEMs and DLA that were identical. Each unique ID also had a set of primary attributes and a set of secondary attributes. The

Table 1. Counts of Connector Attributes Highly Populated in Different Data Sources

Total populated attributes	Total sources with populated attribute information	Data sources				
		FLIS	Commercial	L-3 Communications	Northrop Grumman	Specifications and standards
13	1	N	N	N	Y	N
10	1	N	N	Y	N	N
8	1	N	Y	N	N	N
6	2	Y	N	N	N	Y
3	2	N	Y	Y	N	N
3	1	Y	N	N	N	N
2	3	Y	N	Y	N	Y
2	3	Y	Y	Y	N	N
2	4	Y	Y	N	Y	Y
1	2	Y	Y	N	N	N
1	3	Y	Y	N	N	Y
1	2	N	Y	N	N	Y
1	2	N	Y	N	Y	N
1	2	N	N	Y	Y	N
1	1	N	N	N	N	Y
1	3	Y	N	N	Y	Y
1	4	Y	N	Y	Y	Y
1	5	Y	Y	Y	Y	Y

primary attributes have standardized values based on the primary attribute groups defined by the OEMs. The secondary attributes have values in the raw format of the source in which they were found. Each standardized primary attribute was also associated to the raw attribute values from which it was inferred.

Figure 2 is a notional view of how information about common part data could be presented. In the figure, the unique, or master, ID for the part is 466002. The top portion of the figure shows all the matches to this master ID: one NSN, two Northrop Grumman parts, and one L-3 Communications part. The lower portion of the figure shows that the part is a connector with part number D38999/24WD18SN defined in MIL-DTL-38999/24, "Connectors, Electrical, Circular, Miniature, High Density, Quick Disconnect (Bayonet, Threaded, and Breech Coupling), Environment Resistant, Removable Crimp

Figure 2. A Notional Approach to Presenting Shared Common Part Data

Master ID	NSN	Northrop Grumman ID	L-3 Communications ID
ID466002	5935-01-220-0806	148646	1501736
		1792658	

ID466002–Military Specification D38999/24WD18SN		
Attribute	**Value**	**Source**
Number of Contacts	18	FLIS, Spec., L-3
Contact Gender	Female	FLIS, Spec., L-3
Connector Gender	Female	FLIS, Spec.
Rated Current	7.5 Amps	FLIS
Contact Size	16	FLIS, Spec.
Mounting Type	Jam Nut	Spec., L-3

and Hermetic Solder Contacts." It also shows the primary attributes for this connector along with their values and the sources for this information. Additional information about specific sources of attribute data could be linked to the source column.

The pilot project on sharing DLA, Northrop Grumman, and L-3 Communications data on connectors and fasteners showed that no organization had a complete picture of the supply chain for these items.

Benefits

Everyone involved benefited from sharing information about these commodity parts:

- OEMs were able to identify duplication and reduce the size of their standard parts lists.
- DLA was able to identify opportunities for mitigating part proliferation and item reduction.
- AMRDEC was able to identify additional sources for a number of connectors and fasteners that presented DMSMS problems.

To quantify the benefits of part data sharing, LMI undertook a business case analysis projecting the pilot results across the defense commodity supply chain. The results indicate that parts data sharing is a best practice for both DoD and industry and that sharing nonproprietary part data is beneficial for all parties involved.

DATA SHARING PROMISES DLA ACQUISITION AND SUSTAINMENT SAVINGS

DLA can realize savings from data sharing in two ways: first, through an acquisition strategy, and second, through a sustainment strategy. The following paragraphs discuss these two strategies and, for each, provide estimated savings. The team calculated the savings using empirical data from team members' experiences with connectors and fasteners and then extrapolated the results to an overall commodity level.[1]

Acquisition savings will accrue by providing system designers with easier access to more complete and informative parts data. Access to those data will enable the designer to determine if a part in the federal catalog satisfies the design requirements or if a new part needs to be introduced into the federal catalog. To put it another way, data sharing will prevent the proliferation of duplicative NSNs. To gain the greatest benefit from data sharing, more industry partners must come on board, and item data must be enriched to permit designers and engineers to find and reuse parts to the greatest extent possible.

To quantify the acquisition savings, the study team calculated the percentages of rejections of new part requests they experienced due to parts management efforts for connectors and fasteners; rejections ranged from 34 to 57 percent. The team then averaged the percentages and multiplied the result by the number of new commodity items that entered the federal catalog in FY10 (48,000) to determine the number of commodity items whose entry into the system could have been avoided through parts management. The team then multiplied that number by the cost avoidance associated with preventing an item from entering the federal catalog: $7,235 (FY10 dollars).[2] The study team concluded that DoD could realize an estimated annual cost avoidance of $150 million per year by preventing new parts from entering the system.

Sustainment savings will accrue by instituting an item reduction policy and eliminating duplicative items from the federal catalog. More specifically, sustainment savings related to data sharing are due primarily to the following:

- *Reduction in purchase costs.* With knowledge of the costs of identical items available from different sources, DoD will be able to purchase the lowest-cost item among the identical alternatives. For the two commodities we examined, we identified between 4 percent and 9 percent of the items as duplicates. Using the relative sales volumes of these commodities, we estimate that around 7 percent of commodity items are duplicate parts. Purchasing the less expensive of duplicates will generate approximately 2.7 percent savings on $3 billion in purchases, or $82.3 million. In addition, DoD will be able to obtain bulk order discounts by buying more of one item instead of purchasing two items separately. We estimate this to be 0.14 percent of sales, or $4.2 million.

- *Reduction in inventory costs.* Instead of holding inventory of two items that are identical but have different NSNs, DoD will be able to combine the inventories of the two items and thus reduce the inventory level, requiring less safety stock. The team estimates that at 0.8 percent of the $5.2 billion inventory of commodity items, or $42 million. That, in turn, will reduce the recurring holding costs associated with tying up money in unnecessary inventory. We used DLA's figure of 8.5 percent to arrive at a savings of $3.5 million per year. DLA will realize these savings as inventory is sold off and is attritted over time.

The study team estimated that for all commodities, DoD could realize a one-time sustainment saving of $42 million due to the reduction in inventory and recurring sustainment savings of $90 million each year for 10 years due to the reduction in purchase and inventory holding costs. The recurring sustainment savings are a sum of $82.3 million from a reduction in purchase costs, $4.2 million in bulk discount savings, and $3.5 million from inventory holding costs.

Nonmonetary benefits include the ability to identify more sources for difficult-to-source items. By sharing part and CAGE information with OEMs, DLA can identify sources of supply that are not in federal data. In addition, OEM data will include part attribute information that can augment similar federal data.

The following are other nonquantifiable benefits:

- *Reduction in procurement workload.*
    - Buying more of fewer items reduces the number of purchase requests, thus reducing procurement workload.
    - Having better product data facilitates procurement.
- *Reduction in obsolescence.* Having fewer parts with higher demand results in industry sustaining parts for a longer period of time, thus decreasing obsolescence. This, in turn,
    - improves readiness,
    - reduces customer wait time, and
    - provides better customer service.

From the DoD perspective, it is difficult to pursue the sustainment strategy and eliminate duplicative NSNs already in the federal catalog. Easier gains can be accomplished by preventing item proliferation, as addressed above.

DATA SHARING PROMISES BENEFITS TO INDUSTRY

Industry can attain savings by identifying duplicative parts and applying similar acquisition and sustainment strategies as discussed above, as well as by examining and using

DoD/industry common-use parts. By matching its common-use parts list with lists of parts preferred by DoD, an OEM can strategically select items to place on its common-use parts list, knowing that it will see the most demand for those items from its government clients.

Each of the OEMs involved estimated a cost avoidance of $800,000 to $2 million per year over 10 years just for fasteners and connectors.

Conclusion

From this pilot project, the study team saw that parts data sharing is a best practice for both DoD and industry and that sharing nonproprietary part data is beneficial for all parties involved. Specifically, the team discovered the following:

- OEMs can share data on purchased commodity parts and improve their part selection processes without jeopardizing their overall business advantages.
- DoD can benefit from a more standardized supply chain for commodity parts that reduces the number of stocked items and overall inventory levels.
- Greater commonality in the usage of commodity parts will lead to a more responsive and robust supply chain.
- The identified benefits will be achieved only with greater OEM participation across additional commodities.

DLA is now evaluating approaches to institute a shared parts data network that will realize the promise of this pilot study.

[1]We studied Federal Supply Code (FSC) 5935—Connectors (about 170,000 items) and FSC 5305, 5310, or 5306—Fasteners (about 300,000 items). We extrapolated our results to all commodity FSCs (about 2.3 million items, 273 FSCs).

[2]The cost avoidance estimate is from *FY1999 Costs to Hold, Order, and Terminate* (published by the DLA Office of Operations Research and Resource Analysis), inflated by 122.7 percent (1/OSD Comptroller operations and maintenance deflator).

About the Authors

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GIDEP—Meeting the Challenges of Life-Cycle Management through Information Sharing

By Jim Stein and Rudy Brillon

Today, perhaps more than ever, systems program managers, engineers, and logisticians are under pressure to design, develop, deploy, and maintain systems—throughout their life cycle—with less money, time, and resources. Aggravating this pressure are the constant aging of equipment, the scarcity of parts, the loss of manufacturing sources, and the ever-present threat of counterfeit parts and materials leaching into the supply chain. Systems management today is not for the faint of heart.

Successful systems managers don't try to go it alone. They learn from the experiences of others, they look for better ways of doing business, and they are quick to share the lessons they learn with their peers because they know that by helping others they are helping themselves clear the obstacles standing in their way on their path to success. It is through information sharing that they are able to achieve their goals.

The concept of information sharing is one that was recognized back in the late 1950s and early 1960s by the Army, Navy, and Air Force. Engaged in similar assessments in support of the Ballistic Missile Program, the services realized that through information sharing, they would be able to reduce duplicate testing being conducted on the same parts, components, and materials. Thus was born the concept of establishing a government program to facilitate the sharing of information between government and its industry partners to increase systems safety, reliability, and readiness while reducing development, production, and ownership costs. By 1970, this concept had grown into the Government-Industry Data Exchange Program or GIDEP. Through the years that followed, GIDEP continued to expand its membership to include the National Aeronautics and Space Administration, the Department of Energy, and the Canadian Department of Defence, as well as many other U.S. federal agencies and industry partners. GIDEP also continued to expand its roles and responsibilities. In 1991, it was designated the federal government's repository for information concerning nonconforming products and materials (Office of Federal Procurement Policy Letter 91-3), and in 1995, it was designated the DoD information repository for Diminishing Manufacturing Sources and Material Shortages (DMSMS).

Today, GIDEP is a joint service, federal government and industry-wide, multinational program managed by DSPO. At the heart of the program is a series of interactive databases, currently containing approximately 200,000 documents with information that pertains to more than 2,000,000 parts. This information is updated daily as it is received from approximately 1,800 U.S. and Canadian GIDEP member organizations. Those organizations have reported myriad success stories and over $2 billion in savings and cost avoidance achieved through the sharing of information.

Types of Information Shared among GIDEP Members

What kind of information is shared among GIDEP members? Below are the current categories of data and the associated benefits of sharing this type of information.

FAILURE EXPERIENCE DATA

GIDEP reports on failure experience data provide a means to exchange information about nonconforming parts and materials discovered during the design, test, integration, manufacture, and support of government and industry systems. A nonconforming part does not meet the technical requirements of the contract or advertised characteristics. These reports (Alerts, Safe Alerts, Problem Advisories, Agency Action Notices, and Lessons Learned) inform the GIDEP participants that a problem exists and help prevent the use of the problem parts and materials. This information assists GIDEP information users with improving the availability, reliability, maintainability, quality, and safety of their systems and equipment. Failure experience data may result in significant cost avoidance and, more important, may prevent injuries and save lives.

SUSPECT COUNTERFEIT DATA

GIDEP contains information on suspect counterfeit parts and materials. GIDEP members provide fact-based reports on items that, after having undergone inspection and, in many cases, extensive testing and analysis, are suspected to be counterfeit. Because counterfeit parts jeopardize the integrity of a system, these reports provide GIDEP participants with the knowledge they need to actively screen their inventories for such items. These reports also help to prevent the recirculation of these items back into the supply chain. Like failure experience data, this information helps users improve the availability, reliability, maintainability, quality, and safety of their systems and equipment, as well as reduce total ownership costs.

DMSMS DATA

DMSMS notices are generated when a part manufacturer announces that a part or a production line will be discontinued. This information, often augmented with cross-reference data, is stored in GIDEP. The majority of DMSMS notices have been issued on piece parts, especially in the electronics area (primary microcircuits); however, DMSMS notices are also released at the module, component, equipment, or other level. GIDEP also has a great deal of discontinued part information on non-electronic types of commodities such as fasteners, software, valves, and filters. GIDEP is the designated DoD centralized database for managing and disseminating DMSMS information. The database contains information for parts manufactured according to military or government specifications and commercial parts. DMSMS information assists users with their obsolescence management programs.

ENGINEERING DATA

GIDEP engineering data include technical reports on research materials; quality assessments; engineering tests; evaluation and qualification tests; parts and materials specifications; manufacturing, design, and process controls; and other related engineering data on parts, components, materials, and processes. The data cover a wide range of topics crossing over many professional disciplines pertaining to both commercial and military applications generated during research, development, testing, production, procurement, and logistical operations. This information is intended to help GIDEP members eliminate duplicative effort, gain more knowledge from others' lessons learned, improve quality, and reduce testing. All these may lead to savings in labor hours and reduce costs during development, production, and sustainment. Some of the most frequently downloaded engineering data are technical reports on lead-free components, tin whiskers, commercial off-the-shelf electronics, counterfeit mitigation strategies, and test reports on electronics.

METROLOGY DATA

GIDEP metrology data include calibration procedures and technical manuals for test and inspection equipment. The data also include engineering information on calibration laboratories, calibration systems, and measurement systems. The National Institute of Standards and Technology contributes a significant portion of the engineering data related to measurement science. Metrology data are provided by participants from industry, government, and professional groups from the metrology community.

PRODUCT INFORMATION DATA

GIDEP product information data (PID) contain notices on parts, components, and materials for which the attributes have been changed by the manufacturer. GIDEP contains two types of PID information: product change notices (PCNs) and product information notices (PINs). PCNs are manufacturers' notices informing their customers of changes that may affect the form, fit, function, or reliability of their products. Below are some examples of types of changes that manufacturers report to GIDEP:

- Changes to data books/sheets
- Device markings
- Die modifications
- Facility relocation
- Shipping labels/containers
- Specifications
- Technology rights transfer
- Wafer fabrication processes.

Most manufacturers use PCNs to communicate any changes to their customers. In some cases, however, manufacturers use PINs to report information to the GIDEP community such as the following:

- Introduction of a new product to the marketplace
- Manufacturer datasheets
- Test data
- Qualified manufacturers list status (for microcircuits)
- Package information (for microcircuits).

GIDEP product information data are used to inform product users of changes in the technical characteristics or parameters of items or materials. These notices provide advanced notification of product changes in order to allow GIDEP members sufficient lead-time to make any decisions about using alternative sources, redesigning components of a system, or procuring sufficient quantities of current items.

RELIABILITY AND MAINTAINABILITY DATA

GIDEP reliability and maintainability (R&M) data consist of technical reports on various reliability concepts, theories, methods, and practical engineering tools for making reliability decisions. R&M data also include information on parts, subsystems, and systems based on operational field performance data, accelerated laboratory life testing, and R&M demonstration tests.

In addition to electronics, the database includes R&M information on mechanical, electromechanical, hydraulic, and pneumatic items. GIDEP R&M data help conserve valuable labor resources through the elimination of duplicative efforts.

GIDEP Users and Services

How does GIDEP help systems program managers, engineers, and logisticians meet the challenges of life-cycle management? Through its web-accessible database, GIDEP provides its users a variety of services:

- *Design, component, and system engineers.* GIDEP provides these engineers with a ready source of part and other technical information to significantly shorten the time required for design and parts selection. GIDEP also provides information about nonconforming products, suspect counterfeits, and product obsolescence that can be used to avoid costly delays in the development of new or modified systems.
- *Production engineers.* GIDEP provides production engineers with information about new and innovative techniques to improve production processes and reduce production costs, as well as information on practices used and in use by industry.

- *Reliability engineers.* GIDEP provides reliability engineers with failure experience data that can help preclude system malfunctions at any point in the life cycle, as well as valuable failure mode and failure rate information for modeling and assessment studies.
- *Logisticians.* GIDEP provides logisticians with discontinued part notices, reports on components suspected to be counterfeit, and product change notices important in maintaining systems that have been in use for decades. Logisticians can also access mean repair time data for use in projecting logistics support and supply requirements.
- *Managers.* GIDEP provides manufacturers with best practices such as cost estimating and cost studies, value engineering, facility management, and other management-related information.
- *Calibrators.* GIDEP provides calibrators with ready access to many current calibration procedures and thousands of technical manuals for test and measurement equipment.
- *Members.* GIDEP provides members with the opportunity to network and benefit from a broad range of personal contacts with fellow members representing almost every technical discipline and endeavor across the federal government and its industry partners.

Conclusion

GIDEP helps meet the challenges of life-cycle management through information sharing. So, if you are a systems manager or anyone who could benefit from having access to the information described above, please visit www.gidep.org to learn more about how GIDEP can help and how you can become a GIDEP member.

GIDEP membership and data access are free.

About the Authors

Jim Stein is the GIDEP program manager. He has 27 years of experience in the federal government in logistics, engineering, and program management.

Rudy Brillon is the GIDEP Operations Center director. With a background in information technology, he has spent the last 26 years developing, implementing, operating, and maintaining information systems in support of DoD maintenance, configuration, logistics, ordnance, and metrology management.

Standardization in the Organic Depot Maintenance System

By Nick Avdellas and David Oaks

DoD has 17 organic depot maintenance facilities: 5 Army depots, 2 Marine Corps maintenance centers, 4 Navy shipyards, 3 Navy fleet readiness centers, and 3 Air Force air logistics centers. Over the past several years of contingency operations, work at these facilities has increased by 44 percent, going from 69 million direct labor hours in FY01 to 99 million in FY08.

But as DoD moves away from the current war footing, these high levels of organic depot maintenance activity will not be sustained. Ground forces deployed to Iraq and Afghanistan will gradually draw down, and some older systems, such as helicopters and fighter aircraft, will be replaced with newer ones, reducing, in the short run, the need for depot maintenance. Further, overall pressure to reduce funding for contingency operations and the overall defense budget will likely result in fewer dollars for depot maintenance.

These trends point to an uncertain near-term future for the organic depot maintenance system. Although the depot maintenance community has always had to contend with some level of uncertainty about the future, it is now faced with two substantial challenges:

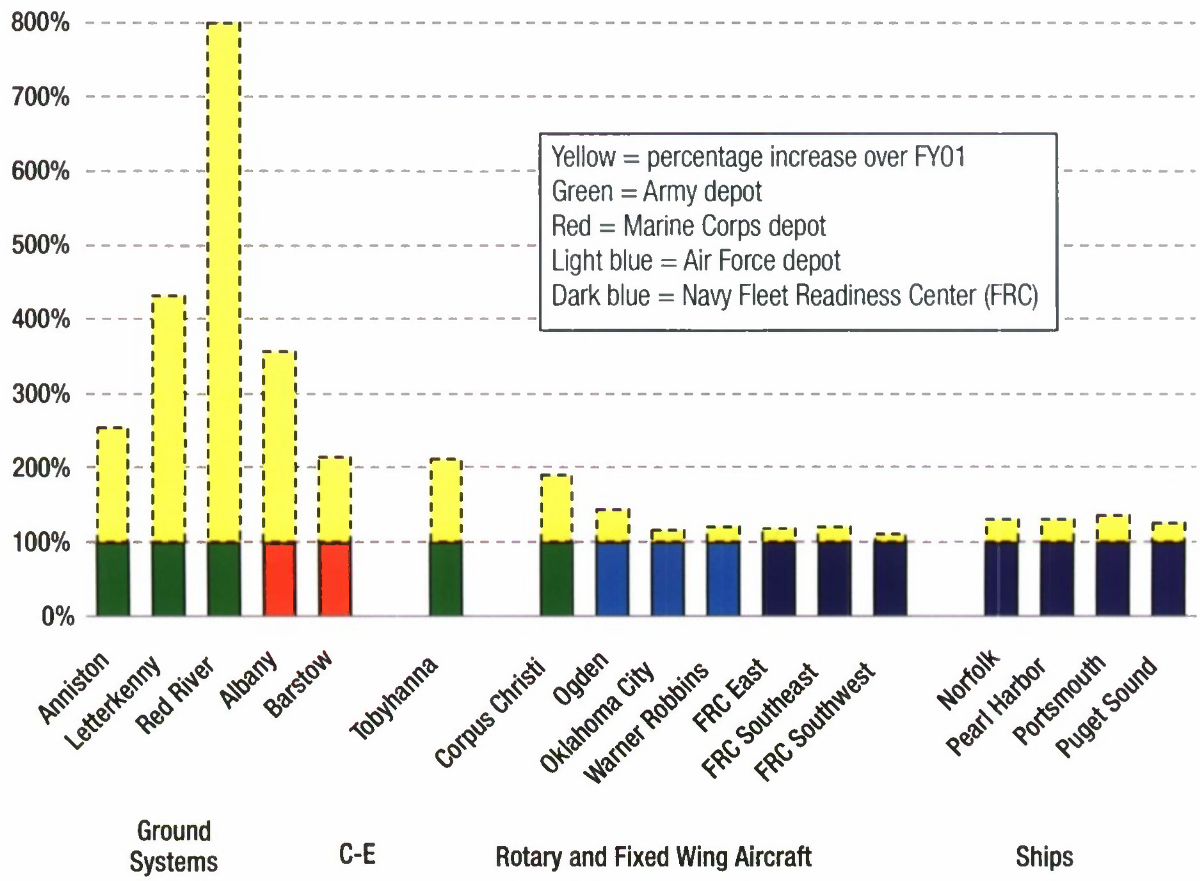
- Potentially wide range between the requirement for support and total depot maintenance workload
- Widely disparate allocation of work across the 17 organic depot maintenance facilities.

The latter challenge is no surprise in light of the uneven growth in workload across the organic system over the past several years. As shown in Figure 1, at depot maintenance facilities for aircraft and ships, workloads in the high-production years were about 40 percent greater than they were in FY01, while at facilities supporting ground systems and communications-electronics (C-E) systems, workloads in the high-production years reached levels two-, four-, or even eightfold over FY01 levels.

To respond effectively to this uncertain future, logistics managers at the service and departmental levels will need a standard array of reliable information for a focused set of variables, or management tools, that are positively correlated with good outcomes. The following variables are key:

- Budget visibility—what maintenance funds are available to spend on which things?
- Cost comparisons (cost to repair versus cost to replace)—where are opportunities to economize; at what point might it make more economic sense to replace an item rather than repair it?

Figure 1. Highest Level of Depot Maintenance Work in a Single Year, Relative to FY01 (FY01=100%)



- Depot capability—what maintenance can be accomplished in-house, in what quantities, and at which locations?
- Work planned and performed—what work is either being performed or expected to be performed, by location?

Although certainly not a cure-all for these challenges, standard information can substantially support an effective response by the organic depot maintenance system to accommodate whatever the future will bring. Awareness of these variables will facilitate enterprise stability and direction. This is one of the crucial needs of a problem-solving organization, one that is able to use a common framework of information to forecast and counter circumstances that could otherwise be surprises.

However, a recent LMI study of the future capability of DoD maintenance depots brought to light a continuing need for increased standardization in important informational variables with which depot inputs, outputs, and overall performance could be measured and managed. A lack of standardization across these variables hinders the ability to readily plan for maintenance work, analyze intra- and interservice comparability, share work across service boundaries, and analyze the tradeoffs between cost and time to deliver. To put it another way, depot maintainers in one service often use different terms or different types of information than maintainers from the other services. As a result—to paraphrase one maintainer—the Army may pass a depot maintenance work requirement to another service, but that service doesn't know what to do with it. This leaves the current system regularly prone to external evaluations based upon varying information sources, with an arguably suboptimal result for the nation.

DoD has recognized the need for standard depot-level maintenance information for many years and has taken some positive steps. For example, in 2008, a depot maintenance integrated process team, in response to the 2007 *DoD Depot Maintenance Strategic Plan*, developed a draft handbook of DoD depot maintenance metrics. This effort focused on metrics that could support a high-level review of materiel availability and ownership costs and arrived at five depot maintenance-related measures: production rate (actual and planned), organic flow days (actual and planned), quality deficiency report rate, direct costs, and indirect costs.

The challenges posed by seeking to produce standard reports across the four services are readily noticeable in the draft handbook. The handbook devotes 12 pages to general reporting instructions but has an additional 15 pages of single-spaced "supplemental service instructions." In the most streamlined sections of the supplemental instructions, directions include guidance to "interpret" and "decipher"; the lengthier sections contain intricate instructions to both depot- and systems command-level personnel and identify an assortment of data sources. Having guidance with such extremes in the level of detail makes it unlikely that the outcome will be a standard product due to difficulty in preparing the data and the opportunities for human errors when attempting to follow the detailed processes. The handbook was a good start, but opportunities remain to advance depot maintenance management.

One opportunity concerns standardizing three key data elements: depot capacity utilization, work breakdown structure (WBS), and direct and indirect costs. As shown in Table 1, if these data were standardized, depot maintenance managers would have reliable, consistent management information focused on the set of depot maintenance management tools that are positively correlated with good outcomes. The following subsections discuss each of the data elements in turn.

Depot Capacity Utilization

Efforts to standardize the way depot capacity utilization is measured began in the mid-1970s and have continued to evolve. This measure is based on individual workstations.

Table 1. Data Elements That Should Be Standardized to Advance Depot Maintenance Management

Management tool	Depot capacity utilization	Work breakdown structure	Direct and indirect costs
Budget visibility			X
Cost to repair/cost to replace			X
Depot capability	X	X	
Work planned/ performed	X	X	

Notes: Green = element is close to being standardized, yellow = element is somewhat standardized, and red = element requires significant improvement to achieve standardization.

It allows comparison of utilization across depots, even those that do disparate work, for example, depots that focus on microelectronics and those that primarily support airframes. This standard set of measures has proven useful in important analyses such as the last two Base Realignment and Closure rounds. Measurements of capacity utilization rely on and could be further refined by the adoption of a standardized WBS.

Work Breakdown Structure

The WBS is a key component in the identification of workload and capabilities. Its typical hierarchical organization makes it readily useful for aggregation to high levels for strategic decisions or for disaggregation to lower levels for combination with other data elements to make specific decisions, such as analyzing tradeoffs between maintaining a piece of equipment and purchasing new equipment.

At issue today, however, is the existence of multiple WBS hierarchies. For example, DoD Instruction (DoDI) 4151.20, "Depot Maintenance Core Capabilities Determination Process," contains one version, while DoD 7000.14-R, *Financial Management Regulation* (FMR), contains another. The difference can be explained by looking at where software maintenance falls in the two different WBSs. The WBS in DoDI 4151.20 lists all software maintenance under a single element, while the WBS in the DoD FMR lists software maintenance as a subelement for each type of weapon system (fighter, bomber, etc.), as illustrated in Figure 2. The WBS in the DoD FMR arguably provides a better level of detail and should be adopted as the standard WBS for depot maintenance.

Direct and Indirect Costs

One area that is in most need of improvement is the standard measurement of direct and indirect depot costs. Having standard information is especially critical for cost compara-

Figure 2. Comparison of Work Breakdown Structures

DoDI 4151.20 "Depot Maintenance Core Capabilities Determination Process," Table E2.T1.

1	Aircraft
	1.1 Airframes
	1.1.1. Rotary
	1.1.2 VSTOL
	1.1.3 Cargo/Tanker
	1.1.4 Fighter/Attack
	1.1.5 Bomber
	1.1.6 Aircraft-other
	1.2 Aircraft Components
	1.2.1 Dynamic Components
	1.2.2 Hydraulic/Pneumatic
	1.2.3 Instruments
	1.2.4 Landing Gear
	1.2.5 Aviation Ordnance
	1.2.6 Avionics/Electronics
	1.2.7 APUs
	1.2.8 Other
	1.3 Aircraft Engines
2	Ground Vehicles
.	.
7	Software
	7.1 Weapon System
	7.2 Support Equipment
.	.
.	.

DoD 7000.14-R, *Financial Management Regulation*, Volume 6A, Chapter 14, Addendum 4

POSITION			DESCRIPTION
A	0	0	Aircraft
	1	0	Fighters
		1	Basic Aircraft
		2	Engine
		3	Aircraft and Engine Accessories and Components
		4	Electronics and Communications Equipment
		5	Armament
		6	Support Equipment
		7	Other
		8	Software
	2	0	Bombers
		1	Basic Aircraft
		2	Engine
		3	Aircraft and Engine Accessories and Components
		4	Electronics and Communications Equipment
		5	Armament
		6	Support Equipment
		7	Other
		8	Software
	3	0	Cargo and/or Transports
		*	same as for Fighters and Bombers
.	.	.	.
.	.	.	.

The FMR layout makes available a greater level of detail of software work

bility analyses in which work is competed between government and commercial providers. It is also useful for a better understanding of costs at different government sites. Over the years, the Government Accountability Office has found frequent examples of incomplete or inconclusive cost comparisons of public-private competitions.

DoD has attempted to develop a standard measurement of direct and indirect costs. For example, in 2005, the Joint Group on Depot Maintenance updated the *Cost Comparability Handbook*. The group's purpose was to reduce differences in costing that result from the different managerial and organizational philosophies of the military services. Creating a "level playing field" would facilitate comparisons of workloads between and among the services and private industry. That said, the handbook allowed for local estimation of indirect costs. The recently updated source guidance for Volume 11B, Chapter 13, "Cost Accounting Requirements for Depot Maintenance," of the April 2010 DoD FMR continues to allow local interpretation in applying indirect costs to depot work and prohibits the use of stabilized (working capital fund) billing rates charged to DoD customers. More work needs to be done to standardize the measurement of direct and indirect costs.

Summary

In sum, standardization of important elements of depot maintenance management information can contribute considerably to the continued viability and success of DoD's organic depot maintenance system as it enters this period of near-term uncertainty. Standard management data can further enable a more systematic and strategic view of important design, structural, and behavioral elements of the execution aspects of the organic depot maintenance system. By removing barriers in common management information, standardization can facilitate the depot maintenance system to truly act as an integrated national maintenance enterprise and repair network.

About the Authors

Nick Avdellas is a program manager at LMI. A systems analyst with 23 years' experience, Dr. Avdellas has developed DoD supply chain and maintenance management policy and programs, developed and implemented logistics information systems, and analyzed and improved processes.

David Oaks is an LMI senior consultant. Dr. Oaks is an experienced leader of strategic-level studies for DoD and the Army, addressing such areas as depot maintenance, logistics process improvement, and future Army logistics force requirements.

Program News

Topical Information on Standardization Programs

SD-24 Is Now Available through ASSIST Online

SD-24, *Value Engineering: A Guidebook of Best Practices and Tools*, was published June 13, 2011. It provides guidance and updates information from DoD Handbook 4245.8-H, *Value Engineering*, last published in March 1986, and Army Pamphlet 11-3, *Value Engineering* (undated). Value engineering (VE) can play a key role in ensuring that programs stay within budget or even save money. Its use is particularly important in today's environment of reduced budgets and staffing. DoD can no longer afford the time delays and increased costs that programs have experienced in the past. When one program costs more than planned, decision makers are forced to delay or cancel other programs. Such actions result in criticisms and may prompt outside involvement by the Government Accountability Office, the Inspector General, or even Congress.

SD-24 shows how VE can be an effective mechanism for generating cost savings or cost avoidance for contractors and DoD. The guidebook gives details on the basics of the VE method, discusses how to establish a VE program, describes best practices for applying VE on government contracts, and provides an overview of the benefits of a strong VE program. For more information or to download a copy of SD-24, please go to https://assist.daps.dla.mil or http://assistdocs.com.

IEEE Agrees to Sponsor No-Cost Access to Five Standards

On April 8, 2011, the Air Force Research Laboratory Radio Frequency Radiation Bioeffects Branch signed an agreement with the Institute of Electrical and Electronics Engineers (IEEE) to grant the public no-cost access to view and download five electric, magnetic, and electromagnetic field (EMF) health and safety standards. The 5-year contract, engineered by the Air Force and funded by the Naval Surface Warfare Center, provides full web-based access to the IEEE C95 copyrighted standards at the IEEE Standards Association's "IEEE Get Program" (http://standards.ieee.org/about/get/index.html). Standards remain in the program until they are replaced or superseded by a new standard or are withdrawn. The National Technology Transfer and Advancement Act of 1995 (Public Law 104-113), signed into law on March 7, 1996, requires all federal agencies to use, when possible, standards developed by voluntary consensus standards bodies instead of government-unique standards. The act includes provisions that encourage federal agencies to partner with the private sector in the development of standards that not only help improve the efficiency and effectiveness of government, but also strengthen the U.S. position in the global marketplace. Sponsorship of these standards clearly accomplishes this partnering and, more important, serves to advance global harmonization of EMF health and safety standards.

The following standards became available on the "IEEE Get Program" site on June 1, 2011:

- IEEE C95.1-2005, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz."
- IEEE C95.3-2002, "IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to Such Fields, 100 kHz–300 GHz."
- IEEE C95.3.1-2010, "IEEE Recommended Practice for Measurements and Computations of Electric, Magnetic, and Electromagnetic Fields with Respect to Human Exposure to Such Fields, 0 Hz to 100 kHz."
- IEEE C95.6-2002 (R2007), "IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0–3 kHz."
- IEEE C95.7-2005, "IEEE Recommended Practice for Radio Frequency Safety Programs, 3 kHz to 300 GHz."

Events

Upcoming Events and Information

August 29–September 1, 2011, Fort Lauderdale, FL

DMSMS and Standardization Conference

Mark your calendars now and plan to attend the 2011 Diminishing Manufacturing Sources and Material Shortages (DMSMS) and Standardization Conference at the Westin Diplomat Hotel in Hollywood, FL. Once again, the conference will include multiple tracks of topics, including one featuring topics relating to the Defense Standardization Program and another on the Government-Industry Data Exchange Program. As the conference planning develops, key information will be posted on the DMSMS 2011 website. For more information, please go to the DMSMS website at http://www.dmsms2011.com.

October 13, 2011, Washington, DC

World Standards Day

The 2011 U.S. Celebration of World Standards Day will take place on October 13, 2011, from 6:00 p.m. to 9:00 p.m. at the Fairmont Hotel, in Washington, DC. The administrating organization for this year's event is the International Association of Plumbing and Mechanical Officials. Although details are still being worked out, you can find more information by going to http://www.ansi.org/events.

October 24–27, 2011, San Diego, CA

14th Annual Systems Engineering Conference

Mark your calendars now and plan to attend the 14th Annual Systems Engineering Conference, to be held at the Hyatt Regency Mission Bay in San Diego, CA. Though details are still being worked out, prospective attendees are encouraged to check the conference website at http://www.ndia.org/meetings/2870/Pages/default.aspx for information as it becomes available.

People

People in the Standardization Community

Welcome

Laura LaPerle, of Defense Logistics Agency (DLA) Aviation, Richmond, VA, is newly assigned as a chemist to the standardization team. Ms. LaPerle recently graduated with a B.S. in chemistry. As a prerequisite to joining the standardization team, she is attending the Quality Assurance Specialist Intern Program, which she is expected to complete in August 2011. She will assume the preparing activity (PA) responsibilities for the standardization documents under standardization code DLA-GS1. She will be a valuable addition to the standardization team in DLA Aviation.

Lilibeth de Los Santos, of DLA Aviation, Richmond, VA, was recently reassigned to the standardization team from the Data Management Division. She has a wealth of experience from her more than 35 years of federal service, including the last 15 years with DLA. She is an industrial engineer with a wide variety of experience in DLA Aviation engineering activities. We are taking advantage of her skills and knowledge to further develop and improve our standardization activities. She assumes the PA responsibilities for the standardization documents under standardization code DLA-GS3.

Deborah D. Thompson, of DLA Land and Maritime, Columbus, OH, was recently promoted to chief of the Logistics and Standardization Support Division. She comes with 10 years of experience in the acquisition arena and 17 years of experience in the Packaging Branch, part of which included serving as the branch chief. Ms. Thompson replaced Kendall Cottongim, who took another job assignment within DLA Land and Maritime. As division chief, Ms. Thompson oversees the functions of the Parts Support and Standardization Branch, the Diminishing Manufacturing Sources and Material Shortages and Generalized Emulation of Microcircuits Program Branch, and the Packaging Branch.

Elaine D Jordan, of DLA Aviation, Philadelphia, PA, is the newly promoted supervisor of the Standardization Program Branch. That branch supports DLA Aviation, Richmond, VA, and oversees several functions, including parts management, standardization management, item reduction, packaging, bailment, value engineering, organic manufacturing, engineering support program, critical safety items, and first article and production lot tests. Ms. Jordan has been with the DLA family for 32 years. Her experience in procurement and quality assurance will improve our standardization activities.

Farewell

Mark Parshall, of DLA Land and Maritime, Columbus, OH, retired on December 31, 2010, with 31 years of federal service. He started his federal service in the Air Force in April 1979. After his tour with the Air Force, he began a long civilian career with the qualifying activity in the Engineering and Standardization Directorate, formerly the Defense Electronics Supply Center (DESC), Dayton, OH. There, Mr. Parshall specialized in the qualification of microcircuits, including space-level requirements. He worked his way up from his entry-level electronics technician position at DESC to a journeyman-level electronics technician at DLA Land and Maritime. During that period, Mr. Parshall changed his qualification specialization to resistors, capacitors, filters, and hoses. Mr. Parshall was very dedicated and was driven to ensure our service men and women received the best and most reliable components available.

Roger Kissel, DLA Land and Maritime, Columbus, OH, retired on April 30, 2011, after 38 years of federal service. Mr. Kissel started his federal service as the PA in the Engineering and Standardization Directorate (formerly DESC), Dayton, OH, in April 1973. He served as an electronics technician in the semiconductor area his entire career. During his career, he witnessed the evolution of the semiconductor industry and the transition of the transistor standardization document from MIL-S-19500 to MIL-PRF-19500. Mr. Kissel not only served as the office historian for semiconductors but was considered by all to be one of the most knowledgeable people in the industry on semiconductors.

Patrick G. Kyne, of DLA Land and Maritime, Columbus OH, retired on April 30, 2011, with over 39 years of federal service. Mr. Kyne started his federal service in the Navy in August 1971. Upon discharge from the Navy, he started with the PA in the Engineering and Standardization Directorate (formerly DESC), Dayton, OH, in August 1977. He worked his way up from his entry-level electronics technician position to a journeyman-level senior electronics technician position. As the PA, Mr. Kyne worked electronic filters, capacitors, and the MIL-STD-202 test method standard. He was very dedicated and went to great lengths to make sure his many military and industry customers were satisfied.

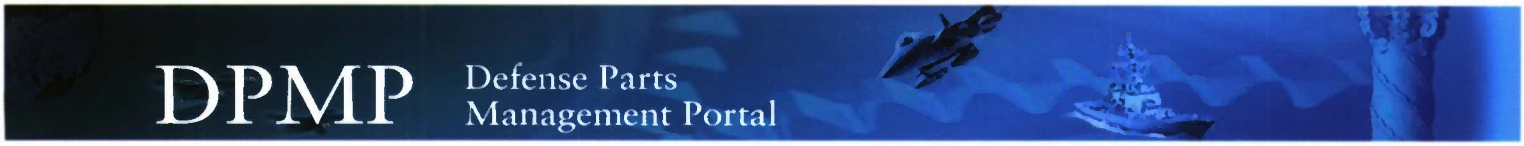
David W. Leight, of DLA Land and Maritime, Columbus OH, retired on April 30, 2011, with 30 years of federal service. He started his federal service in the Air Force in April 1981. Upon discharge from the Air Force, he started working for the U.S. Postal

Service and then the PA in the Engineering and Standardization Directorate (formerly DESC), Dayton, OH, in 1987. Mr. Leight worked his way up from his entry-level electronics technician position to a journeyman-level electronics technician position, working on fiber optics. He was well respected for his work in the fiber optics industry. One of Mr. Leight's recent accomplishments was the development of a new specification for next-generation fiber optic connectors using the latest technology, MIL-PRF-64266. He won the 2009 Defense Standardization Program Distinguished Achievement Award for his work on these connectors. Mr. Leight left a lasting impression on the fiber optics industry.

Kenneth S. Rice Jr., of DLA Land and Maritime, Columbus OH, retired on April 30, 2011, after 34 years of total federal service. Mr. Rice had 10 years of prior military active duty service with the U.S. Navy and the U.S. Air Force, and continued in military reserve status with the U.S. Air Force Reserve. He started his civilian federal service with the PA in the Engineering and Standardization Directorate (formerly DESC), Dayton, OH, in December 1986. His accomplishments as a technician in the Microelectronics Branch of the PA at DLA Land and Maritime were many. His knowledge and experience in his assigned PA area of memory microcircuits and field programmable gate arrays were valued and sought after by his peers in both the government and industry.

Passings

It is with sadness that we must report the news that **John M. Tascher**, who retired in 2003 from DSPO, passed away on July 30, 2011. Mr. Tascher began his career in 1965 as a general engineer at the Library of Congress. He also worked at the National Institute of Standards and Technology, the U.S. Metric Board, and the Department of Commerce, before accepting a position in 1985 with the Department of Defense in the office now known as DSPO. Mr. Tascher served as the metric coordinator for DoD and as chairman of the DoD Metric Conversion Committee. Beginning with the MilSpec Reform initiative of 1994, he was the review authority for the military department performance specifications. He also served as the Head of Delegation to the NATO AC/301 Cadre Group on Material Standardization and worked to develop a complete library of international standardization agreements—from NATO; the American, British, Canadian, and Australian Armies' Program; and the Air Standardization Coordination Committee—for the ASSIST database.



Defense Parts Management Portal–DPMP

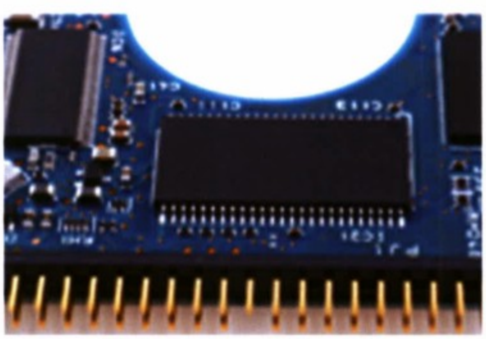
The DPMP is a new public website brought to you by the Parts Standardization and Management Committee (PSMC) to serve the defense parts management community.

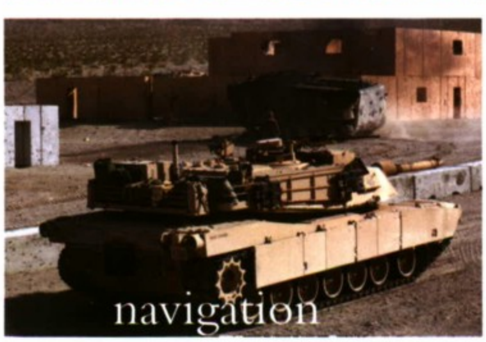
The DPMP is a new resource, a new marketplace, and a "one-stop shop" for parts management resources. It is a navigation tool, a communication and collaboration resource, and an information exchange. It gives you quick and easy access to the resources you need, saves you time and money, connects you to new customers or suppliers, and assists you with finding the answers you need.

This dynamic website will grow and be shaped by its member organizations. A new and innovative feature of the DPMP is its use of "bridge pages." Organizations with interests in parts and components are invited to become DPMP members by taking control of a bridge page. Chances are good that your organization is already listed in the DPMP.

There is no cost.

Explore the DPMP at https://dpmp.lmi.org. For more information, look at the documents under "Learn more about the DPMP." Click "Contact Us" to send us your questions or comments.





Upcoming Issues
Call for Contributors

We are always seeking articles that relate to our themes or other standardization topics. We invite anyone involved in standardization—government employees, military personnel, industry leaders, members of academia, and others—to submit proposed articles for use in the *DSP Journal*. Please let us know if you would like to contribute.

Following are our themes for upcoming issues:

Issue	Theme
October/December 2011	International Standardization
January/March 2012	Tri-Agency Standardization
April/June 2012	Standardization Stars

If you have ideas for articles or want more information, contact Tim Koczanski, Editor, *DSP Journal*, Defense Standardization Program Office, 8725 John J. Kingman Road, STP 5100, Fort Belvoir, VA 22060-6220 or e-mail DSP-Editor@dla.mil.

Our office reserves the right to modify or reject any submission as deemed appropriate. We will be glad to send out our editorial guidelines and work with any author to get his or her material shaped into an article.