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Diminishing Manufacturing Sources and Material Shortages

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PBL Product Support Arrangements
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Software Obsolescence
DMSMS Case Study

Defense Standardization Program
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Contents *July/September 2014*

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Director's Forum

"Magic Always Comes with a Price" Rumpelstiltskin

A subtheme of recent TV shows "Once Upon a Time" and "Once Upon a Time in Wonderland" has been one of not getting something for nothing. Even if you achieve something by magic, there's always a price to pay. And so it is with managing the risks from Diminishing Manufacturing Sources and Material Shortages (DMSMS).

It's barely an exaggeration to call DMSMS subject matter experts (SMEs) magicians. DMSMS management teams routinely resolve obsolescence problems on short notice; demonstrate how to save money on redesigns; and find reliable, trustworthy replacements for out-of-production piece parts that allow operations and maintenance of weapon systems to proceed without interruption. But like other magic, this magic is not free. If DMSMS management is not properly resourced, three things can happen, and they're all bad:

- Schedules can slip.
- Readiness can suffer.
- Out-of-cycle redesigns will eat your lunch.

There's only one way to protect yourself and that is to proactively identify DMSMS risks in advance with a large enough window of opportunity to minimize the ill effects at the lowest practical cost. As one of the articles in this *Journal* notes, DMSMS management is the key to higher availability and lower costs. A modest investment to implement management processes and tools for proactive DMSMS management can result in numerous benefits over the life of a system. Such tools can help to provide a comprehensive and data-driven basis upon which to plan for the most cost-effective resolutions to DMSMS issues. DMSMS management also enables program managers to leverage resolutions for common obsolescence problems across multiple platforms, leading to increased operational availability, minimized out-of-cycle redesigns, and reduced sustainment costs.

Other articles in this issue of the *DSP Journal* address performance-based logistics (PBL) as an enabler of proactive DMSMS mitigation, DMSMS management planning and budgeting, and software and materials.

Gregory E. Saunders
Director
Defense Standardization Program Office

DoD product support managers play a vital role in PBL product support arrangements that help reduce DMSMS risks for fielded weapon systems. In his article, Mr. Bill Kobren, director of the Logistics and Sustainment Center at the Defense Acquisition University, describes 10 potential actions that can be taken to better enable DMSMS management. For the most part, those actions revolve around understanding the policies and guidance and getting familiar with and using the tools available to help.

This *Journal* includes two articles on the vital importance of DMSMS management planning and budgeting. One of the best steps that program managers can take to ensure effective DMSMS management is to properly prepare. Two fundamental and interrelated elements in laying an effective foundation are being able to plan for and to budget for DMSMS management. DoD DMSMS SMEs have developed a DMSMS Management Plan (DMP) module within Systems Planning and Requirements Software (SYSPARS) to guide program management. Using this SYSPARS module will enable a program to enhance its productivity and improve its DMSMS management planning. The best intended plan, however, is merely sheets of paper on a shelf unless it is married with the funding necessary to implement it. Indeed, it is vital that a program's DMP reflects actual program funding or is otherwise adjusted. To improve the accuracy of the SYSPARS module, we updated cost metrics with input from DoD DMSMS SMEs and from a Department of Commerce survey focused on DMSMS cost metrics. The resulting revised cost metrics will enable the DoD DMSMS community to better estimate the cost of DMSMS resolutions, thus better positioning programs to appropriately budget for their DMSMS resolutions.

Traditionally, DMSMS management has focused on electronics hardware items; there has been a strong rationale for just such a focus. Electronics hardware items tend to have short life cycles. Furthermore, the evolution of their technology is often driven by commercial interests, with DoD being only a small fish in a much larger customer pond. These factors combine to produce a significant vulnerability to DMSMS risks. DoD systems, however, are not made up of only one type of item, and all of the items within a system design have the potential to experience DMSMS issues. For this reason, DoD must be better positioned to manage the entire DMSMS issue space, not just an electronics subset. Again, DoD DMSMS SMEs are at the forefront of thinking about the expansion of DMSMS management into nontraditional areas, such as software and materials. One article in this *Journal* provides insights into the similarities and differences encountered when applying DMSMS management to software, while another provides an illustrative case study based on material shortages identified in DoD microwave amplifier applications.

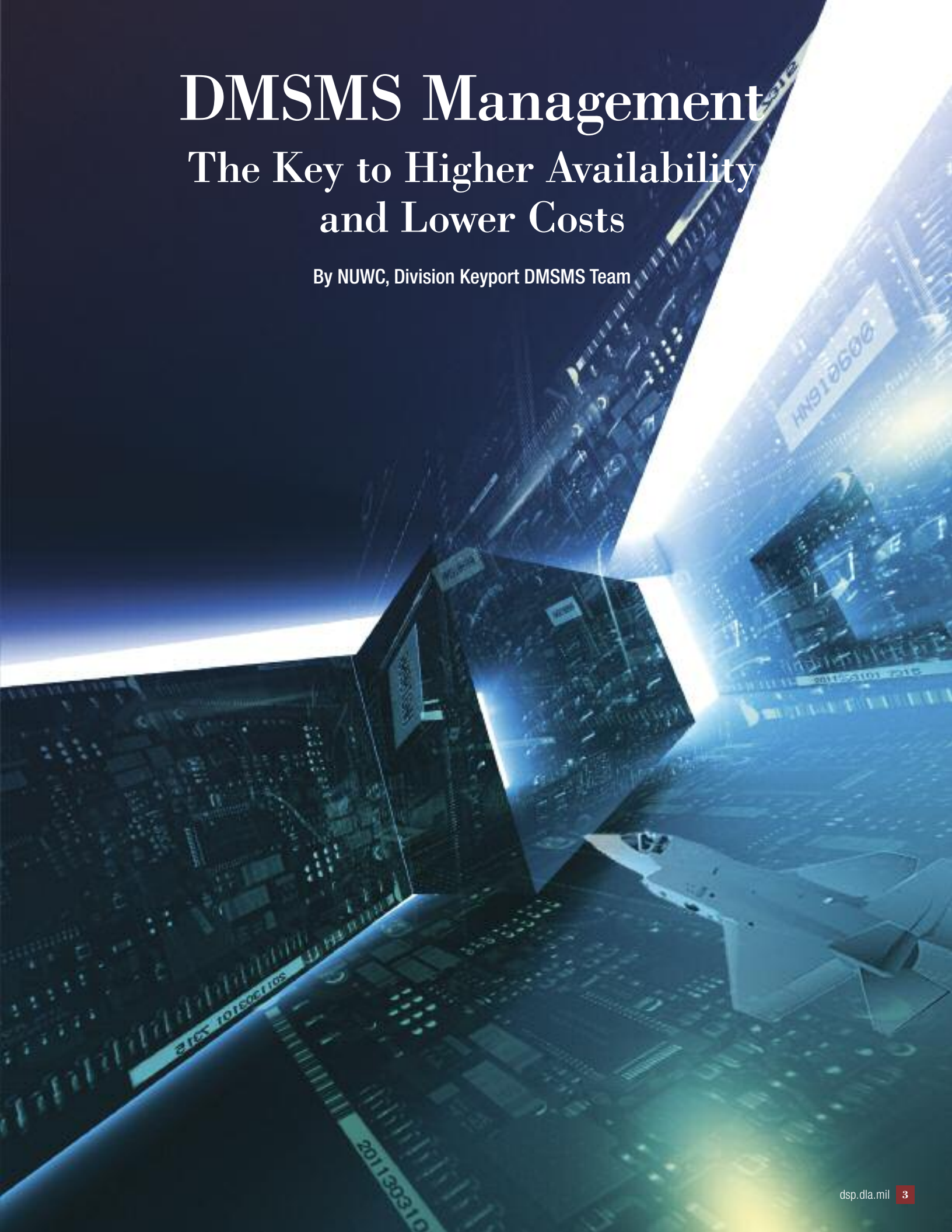
It is important to highlight that the articles in this *Journal* represent only a small fraction of the current thinking and best practices pertaining to DMSMS management that exist across DoD. For further information and to remain current on the latest thinking and approaches, I encourage you to familiarize yourself with the new SD-22, *Diminishing Manufacturing Sources and Material Shortages: A Guidebook of Best Practices for Implementing a Robust DMSMS Management Program*, published in November 2014.

Rumpelstiltskin (a.k.a. the Dark One) may be able to spin straw into gold for you, but his magic comes at an unacceptably high price. Don't put yourself in a money- and time-wasting situation in which you need to make a deal with the Dark One to avoid DMSMS consequences. Invest early in DMSMS management to maximize the window of opportunity to resolve DMSMS issues, and leave Rumpelstiltskin to his spinning for others who did not plan as well.

DMSMS Management

The Key to Higher Availability and Lower Costs

By NUWC, Division Keyport DMSMS Team



As defined in SD-22, *Diminishing Manufacturing Sources and Material Shortages: A Guidebook of Best Practices for Implementing a Robust DMSMS Management Program* (August 2012), Diminishing Manufacturing Sources and Material Shortages (DMSMS) is the loss, or impending loss, of manufacturers or suppliers of items, or raw materials, or software. DMSMS management is a multidisciplinary process to identify issues resulting from obsolescence, loss of manufacturing sources, or material shortages; to assess the potential for negative impacts to readiness; to analyze potential mitigation strategies; and then to implement the most cost-effective strategy.

DMSMS is a problem that has been confronting program managers, engineers, logisticians, and item managers, in both DoD and private industry, for many years. The problem has been accentuated by the move to more commercial off-the-shelf (COTS)–based architectures and the rapid evolution of technology. Almost anything—electronics, connectors, racks, motors, valves, software, adhesives, switches, circuit breakers, metal alloys, ceramic composites, and the list goes on—can become a DMSMS issue. With respect to material shortages, DMSMS can affect the manufacture of military systems and platforms such as submarines, ships, aircraft, and tanks.

DMSMS issues affect both acquisition and in-service platforms and can occur in all phases of the acquisition cycle, from design and development through post-production. DMSMS has the potential to severely impact production, system supportability, and life-cycle costs if not proactively managed. For example, since 2001, the *Virginia*-class submarine program has identified some 1,440 DMSMS issues.

Historically, the majority of DMSMS issues have been in the electronics area; however, DMSMS problems affect all weapon systems and material categories. One of the prime drivers of DMSMS issues is the commercial market's profit motive: when a part is no longer economical to produce, manufacturers will shut down product lines and move on to more profitable items. DoD procurement practices further compound the problem in the way they budget and fund the development, procurement, and sustainment of systems. Long durations between design and production, as well as the extended service life of 25 to 30 years, run counter to the now 4- to 7-year support cycle experienced with many commercial electronic systems.

In 1995, a Government Accountability Office audit[1] identified several DMSMS-related problems, including the following:

- DoD has not collected department-wide data on DMSMS situations and resolutions because the services do not have monitoring systems that provide quantitative information on the magnitude of the DMSMS problem.

- The responses by the services and the Defense Logistics Agency (DLA) to DMSMS situations have been primarily reactive.
- The Navy and the Army have begun developing predictive analysis systems, but they do not have service-wide approaches for all affected parts, and they have not evaluated the cost-effectiveness of DMSMS corrective actions.
- The services pay private contractors to conduct predictive analyses, which limits their use.
- DoD lacks DMSMS planning.

DMSMS Management at Keyport

In the mid-1980s, the Naval Sea Systems Command's (NAVSEA's) Naval Undersea Warfare Center (NUWC), Division Keyport (in Keyport, WA), established a team to manage obsolescence issues associated with submarine combat and sonar systems. However, it was not long before a diverse customer base was established and the team was addressing obsolescence issues for other submarine, surface, and aviation platforms such as the AV-8B Harrier and F/A-18 Hornet. To manage that amount of data effectively, Keyport developed a web-based tool called the Obsolescence Management Information System (OMIS™).

The *Virginia*-class submarine program selected Keyport to manage its obsolescence program. Keyport established a DMSMS management team (DMT) focused entirely on the *Virginia* class. The team comprised experts from depot engineering, with experience in supporting the repair of submarine systems, and experts from the in-service engineering agent, which provides integrated logistic support for submarines in the fleet.

The team identified the requirement to proactively monitor data associated with bills of material (BOMs) for circuit card assemblies, as well as the ability to cross-correlate data for items such as integrated circuits and COTS components that are used in multiple weapon systems. Efficiencies were obtained by monitoring each component once and correlating its obsolescence status with the different weapon systems.

In 2005, after independent validation by the Defense Microelectronics Activity, OMIS was endorsed by the Deputy Assistant Secretary of the Navy (Logistics) as a recognized system for managing DMSMS issues for the Navy. Currently, OMIS is a Navy-approved application providing DMSMS management support for NAVSEA, Naval Air Systems Command, and U.S. Marine Corps programs, as well as for private parties under a Center for Industrial/Technical Excellence Joint Partnership Agreement. The application has continually grown to meet the demand for managing obsolescence and now contains data for more than 50 systems DoD-wide.

Obsolescence Management for All Acquisition Phases

Establishment of a DMSMS management program early in the acquisition process provides invaluable cost-saving benefits over time by reducing or eliminating costly and unplanned technical refresh/redesign efforts. Keyport's obsolescence management approach includes a variety of DMSMS products and services critical to enhancing availability and maintainability to the warfighter (discussed later in this article).

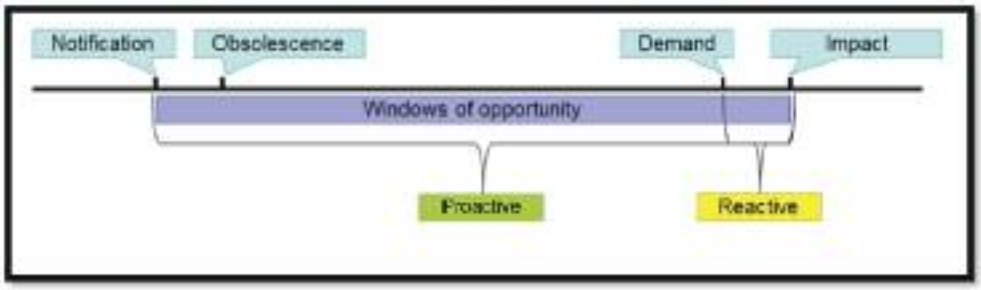
DMSMS management should span all acquisition phases. The various types of obsolescence management activities that occur in each phase are as follows:

- Materiel solution analysis/technology maturation and risk reduction
  - Develop DMSMS charters and DMSMS plans.
  - Develop systems obsolescence cost-over-time projections to minimize technical refresh/redesign costs.
  - Conduct initial technology review of prototype/engineering design model (EDM) systems BOMs.
- Engineering and manufacturing development
  - Establish DMTs.
  - Support DMSMS-related issues and meetings.
  - Conduct follow-on technology review of prototype/EDM system BOMs.
  - Perform technology trending and technology road mapping.
  - Work with program offices/prime contractors (integrators) to insert DMSMS requirements into all production and follow-on performance-based logistics contracts.
- Production and deployment
  - Facilitate DMTs.
  - Support DMSMS-related issues and meetings.
  - Research technical data to develop BOMs.
  - Load BOMs in OMIS and define system obsolescence.
  - Recommend solutions for obsolescence issues based on a best-value analysis.
  - Track obsolescence cases to completion.
- Operations and support
  - Proactively monitor electronic parts and COTS assemblies for obsolescence.
  - Issue periodic component/COTS obsolescence ALERT reports and supportability analysis reports.
  - Provide outyear budgetary estimates to mitigate obsolescence issues.
  - Update DMSMS charters and DMSMS plans.

Proactive versus Reactive Obsolescence Management

A proactive obsolescence management strategy ranges from actively monitoring the availability of critical system components to performing strategic technical refreshes that eliminate or minimize obsolescence. Performing proactive obsolescence management realizes high returns on investment due to early notification of discontinued system parts and components while identifying the most amount of potential solutions, creating a larger window of opportunity to evaluate logistics and engineering solutions that provide the greatest cost benefit to the system (Figure 1). In contrast, a reactive obsolescence management program deals with issues as they occur and incurs increased costs, because parts and components may no longer be available and could affect system operational availability. Because saving money and ensuring the sustainability of systems are important, Keyport utilizes a proactive obsolescence management strategy.

Figure 1. Windows of Opportunity for Proactive and Reactive Obsolescence Management



Data Used by OMIS

To get the most comprehensive and current parts status, OMIS is linked to data from various sources. The primary sources are the DLA EMALL, Naval Supply Systems Command (NAVSUP) weapon systems support (WSS) data, commercial logistics information services, and commercial part data information systems.

OMIS pulls the data from these sources and links it to the part data it stores. Another invaluable source of DMSMS data is Keyport's team of researchers, who reach out to manufacturers and suppliers of commercial items that are not listed or monitored in databases. The team periodically contacts these companies for the current life-cycle status of their products and then updates their status in OMIS. This process ensures complete coverage with no gaps in DMSMS management in order to have the most up-to-date and accurate information. The linking of DMSMS and logistics data enables the user to see not just the procurability of a part but also many factors related to its supportability. When looking for possible obsolescence issues, it is also necessary to look at the issue from a supply chain perspective. This is especially crucial when researching suitable substitutes following the identification of an obsolete part. The aggregation of data sources

linked to OMIS is used to view component availability, life-cycle projections, and risk assessments for system designs.

OMIS relates the hierarchically structured part data for a system with the information from the data sources to enable the user to visualize DMSMS issues and their impacts. In addition, OMIS allows Keyport's DMSMS experts to see how DMSMS issues affect all of the systems whose data are loaded into OMIS. This fact enables a level of collaboration on DMSMS issues that can save programs both time and money.

Keyport's DMTs use data from many other sources—such as the Government-Industry Data Exchange Program (GIDEP), configuration management systems, and FEDLOG—for additional information, including analysis of procurement history, part specifications, and where-used data. GIDEP is used to reduce or eliminate unnecessary resource expenditures by sharing parts information among government and industry participants. OMIS is a proven and accurate tool for program managers to proactively monitor and manage obsolescence and to make informed decisions.

Data Needed for Proactive DMSMS Management

Having sufficient data to complete an obsolescence analysis is the first step in enabling effective obsolescence mitigation and ensuring operational readiness and cost savings for the customer. Of course, all of the data must be verified to ensure that the most accurate and trusted data sources are used for decision making. Analyzing a BOM gives customers key pieces of information that will allow them to proactively manage obsolescence issues. The most crucial elements of the BOM are the manufacturer's name, part numbers, and nomenclature. With this information, the item's specification can be obtained and the production status can be determined. This emphasizes the need for programs to include BOM data as part of their deliverables. Part relationships are shown in OMIS and are used to determine the programmatic impact of the obsolete part. This allows DMSMS issues to be identified and remedied before they become severe enough to affect the warfighter or increase program costs.

DMSMS Management Teams

Because of the multiple disciplines needed to resolve DMSMS issues, Keyport is a strong advocate of DMTs. DMTs should be formed at program creation and continue to be active throughout the life of the program. A DMT's composition and engagement will vary depending on the scope and type of program. Examples of DMT participants are the program office representative, DMSMS service provider, prime integrator/contractor, NAVSUP WSS/DLA, and the responsible engineering activity. Keyport's DMSMS management personnel often participate as experts on DMTs. Members may be logisticians, supply specialists, engineers, program managers, and other key stakeholders. The appropriate participation and authority in the DMT are crucial to ensuring the timely com-

munication of issues to the correct stakeholders and allow for analysis of the various resolution options for the greatest return on investment.

Case Management/Resolution Options

When a DMSMS issue is identified, the DMT determines if the issue affects production or sustainment. OMIS provides a complete set of case management tools that link cases to the affected parts and allow joining of cases when collaboration is warranted. If there is an impact due to the DMSMS issue, a case is generated and assigned a tracking number. DMSMS case management is an approach to document, track, and resolve DMSMS issues throughout a system's acquisition and its life cycle. Often, several resolution options can be presented to the customer to best suit its program requirements. Table 1 summarizes the commonly used solution types.

Table 1. Summary of Commonly Used Solution Types

Solution	Definition
No solution required	A determination is made that the DMSMS issue will not impact the system because, for instance, sufficient stock is on hand to meet system needs.
Approved part	The obsolescence issue is resolved by the use of items already approved on the drawing and still in production.
Life-of-need buy	A sufficient quantity of the item is purchased to sustain the product until its next technology refresh or the discontinuance of the host assembly. Because this solution uses an approved item, no testing or drawing changes are required. The source of supply can be residual stock from the original manufacturer, shelf stock from distributers, sponsor-owned material, etc. Costs for packaging, storage, and transportation should be considered in the business case analysis for selecting solutions.
Extension of production or support	The supplier is incentivized to continue providing the obsolete items. This may involve long-term agreements to procure specific quantities of parts. One-time costs should be included in any cost and cost avoidance calculations.
Simple substitute	The item is replaced with an existing item that meets all requirements without modification to either the item or its next higher assembly (NHA) and requires only minimal qualification. Associated costs are largely administrative.
Complex substitute	A replacement item that has different specifications, but requires no modification of the source product or the NHA, is researched and validated.
Repair, refurbishment, or reclamation	The obsolescence issue is resolved by instituting a repair or refurbishment program for the existing item or assembly, whether a depot repair, a repair contract with the original manufacturer, or support from a third party.
Development of a new source	A replacement product is developed that meets the requirements of the original product without affecting the NHA. Nonrecurring engineering or other development-related activities will likely be required. The new product may be an emulation, a reverse-engineered product, or a product developed as a replacement using a different manufacturer but the original manufacturing designs and processes.
Redesign–NHA	The affected item's NHA must be modified. Only the NHA is affected, and the new design will not affect anything at a higher level in the system.
Redesign–complex/ system replacement	A major assembly redesign affects assemblies beyond the obsolete item's NHA and may require that higher-level assemblies, software, and interfaces be changed.

A business case analysis is used to choose the option that will provide the highest return on investment. That analysis may support a decision to do nothing to resolve the issue because of other factors, such as a planned technology refresh or sufficient supply of the affected system.

Two of the most commonly used solutions are simple substitutes and life-of-need buys:

- Simple substitutes are replacement parts with the same form, fit, and function as the original. Once the replacement part is authorized by the design agent, technical documentation can be updated before the initial part becomes obsolete or current inventories become depleted.
- Life-of-need buys are the purchase of a sufficient quantity of the part to sustain the equipment to its end-of-service date or until a planned technology refresh will replace the equipment.

Each of these solutions saves the program a costly and unnecessary redesign.

Measuring Success

Material availability and cost avoidance are two significant elements of a successful DMT. Proactive monitoring of parts for obsolescence issues within a weapon system or platform helps ensure the availability of the system for the warfighter as well as continued supportability for the future. The continued sustainment of a system and the assurance of adequate sparing are difficult to measure but are a vital result of effective DMSMS management.

The number and type of cases created, resolutions implemented, and the time to implementation are all key measures of a successful DMSMS program. They provide insight into the rate that DMSMS problems are being discovered and allow a program to staff and budget to meet the demand.

Cost avoidance is another key metric to measure the success of a robust DMSMS management program. Cost avoidance is based on a method defined in the SD-22 guidebook using established resolution types that are tied to standardized costs. The case management functions of OMIS enable the gathering of cost and cost avoidance data based on the standard DMSMS solutions. OMIS can easily generate reports that show a program's effectiveness.

Keyport's team has realized more than $225 million in cost avoidance for over 50 DoD customers over the past 18 months. The cost avoidance is attributable to the foresight and planning of a DMSMS team proactively managing DMSMS issues.

Summary

There are many compelling reasons to practice robust DMSMS management, including regulatory requirements, improved total life-cycle costs, and cost avoidance. A modest investment to implement processes and tools for proactive DMSMS management can lead to substantial benefits over the life of a system. The earlier in the acquisition process a DMSMS program is started, the more benefits can be realized. When DMSMS programs are initiated early in the acquisition process, designs can be modified to make DMSMS solutions easier to implement and have a significant impact on cost throughout a system's life. A program can maximize those benefits by establishing a DMT, utilizing DMSMS experts, and loading system data into a proactive DMSMS management system like OMIS. Proactive DMSMS management provides a more comprehensive and data-driven picture that allows for better planning to provide the most cost-effective solutions. It also enables program managers to leverage solutions for common obsolescence problems, leading to increased operational availability, reduced unplanned redesigns, reduced sustainment costs, and greater cost avoidance.

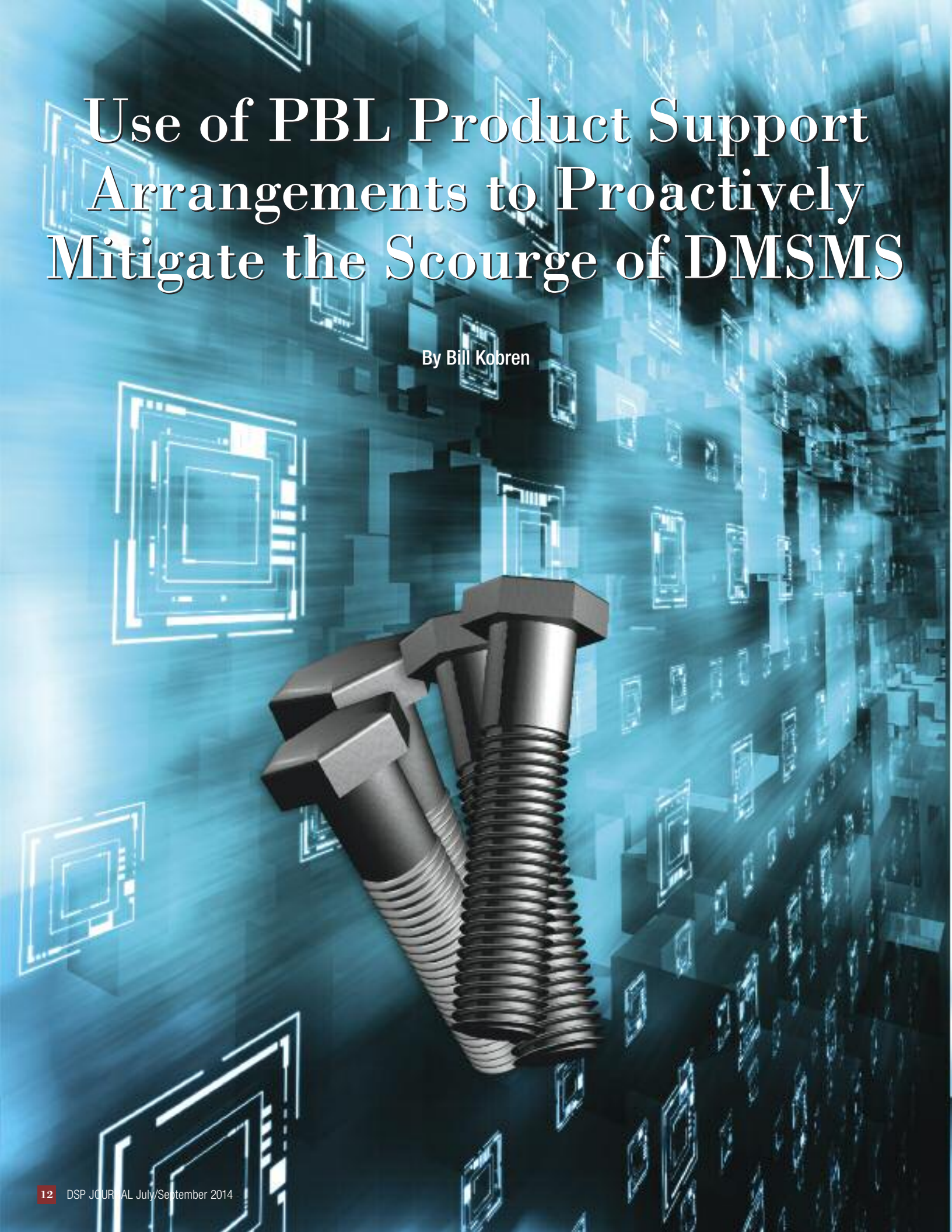
[1]Government Accountability Office, *Defense Inventory: Extent of Diminishing Manufacturing Sources Problems Still Unknown*, GAO/NSIAD-95-85, April 1995.

About the Author

NUWC, Division Keyport's Obsolescence Management Division comprises 80 government and contract personnel who provide DMSMS management support for approximately 50 programs. Keyport has been providing DMSMS support since the mid-1980s. In addition to DMSMS support, members of Keyport's DMSMS team are active participants in both the NAVSEA and DoD DMSMS working groups and have delivered numerous papers, presentations, and training sessions at the annual DMSMS conference.

Use of PBL Product Support Arrangements to Proactively Mitigate the Scourge of DMSMS

By Bill Kobren



DoD product support managers (PSMs) play a vitally important role not only in developing and executing weapon system product support strategies, but also in implementing outcome-based, performance-based logistics (PBL) product support arrangements. Statutorily, Title 10, Section 2337, of the United States Code (USC) specifically tasks DoD PSMs to "ensure achievement of desired product support outcomes through development and implementation of appropriate product support arrangements" and also to "adjust performance requirements and resource allocations across product support integrators [PSIs] and product support providers [PSPs] as necessary to optimize implementation of the product support strategy." These arrangements, as the statute goes on to state, specifically include PBL support strategies.

So what exactly is a PBL product support arrangement? According to the November 22, 2013, "Performance Based Logistics Comprehensive Guidance" memorandum from the Assistant Secretary of Defense for Logistics and Materiel Readiness,

> PBL is synonymous with performance based life cycle product support, where outcomes are acquired through performance based arrangements that deliver Warfighter requirements and incentivize product support providers to reduce costs through innovation. These arrangements are contracts with industry or inter-governmental agreements. Attributes of an effective PBL arrangement include:
>
> - Objective, measurable work description that acquires a product support outcome.
> - Appropriate contract length, terms, and funding strategies that encourage delivery of the required outcome.
> - A manageable number of metrics linked to contract requirements that reflect desired Warfighter outcomes and cost reduction goals.
> - Incentives to achieve required outcomes and cost reduction initiatives.
> - Risks and rewards shared between government and commercial product support integrators and providers.
> - Synchronization of product support arrangements to satisfy Warfighter requirements.

The Diminishing Manufacturing Sources and Material Shortages (DMSMS) community has long recognized the importance of PBL product support arrangements as powerful enablers of proactive DMSMS mitigation for fielded weapon systems. In fact, SD-22, *Diminishing Manufacturing Sources and Material Shortages: A Guidebook of Best Practices for Implementing a Robust DMSMS Management Program* (https://acc.dau.mil/dmsms-guidebook), goes so far as to state that "a properly structured PBL contract contains DMSMS management requirements" by the fact that it "incentivizes the provider to

maintain a proactive DMSMS management program to achieve the required performance outcomes."

Although relatively easily said, how exactly is this done? Again, the SD-22 offers important insights, stating the following:

- "The sustainment provider (defined in 10 USC 2337 as either a … PSI or … PSP) should minimize obsolescence throughout the contract period of performance by selecting suppliers that will avoid or resolve hardware, software, and firmware obsolescence issues.
- "The sustainment provider, especially in the PBL case, should determine the most cost-effective resolution to obsolescence issues. For the purposes of the contract, hardware, software, and firmware should be considered obsolete when the item can no longer be procured from the original component manufacturer (OCM) as identified in the current technical data package (TDP).
- "The sustainment provider, especially in the PBL case, should flow down DMSMS management requirements to suppliers, who should flow down requirements in a similar fashion.
- "The sustainment provider (and possibly an independent third-party contractor if one is to be used) should monitor the availability of parts and components (with agreed-upon frequency of update) and provide the results to the program office. The government should be notified of pending and emergent obsolescence issues, supplier recall notices, and emergent vendor-implemented changes."

Use of PBL product support arrangements is by no means a "fire and forget" approach, particularly when it comes to DMSMS mitigation. Indeed, it is an even more urgent concern for DoD PSMs in view of the requirements mandated by Section 803 of the Fiscal Year 2014 National Defense Authorization Act (Public Law 113-66). Entitled "Identification and Replacement of Obsolete Electronic Parts," the provision requires the Secretary of Defense to "implement a process for the expedited identification and replacement of obsolete electronic parts included in acquisition programs of the Department of Defense."

Subparagraph (b)(5) of the provision goes on in to specify that

> in addition to the responsibilities under Section 2337 of Title 10, United States Code, a product support manager for a major weapon system shall work to identify obsolete electronic parts that are included in the specifications for an acquisition program of the Department of Defense and approve suitable replacements for such electronic parts.

Paragraph (c)(1) of Section 803 defines an electronic part as being obsolete if "(A) the part is no longer in production; and (B) the original manufacturer of the part and its authorized dealers do not have sufficient parts in stock to meet the requirements of such an acquisition program," which is remarkably similar to the SD-22 definition of DMSMS as "the loss, or impending loss, of manufacturers or suppliers of items, or raw materials, or software."

Now that we understand the roles and responsibilities of the PSM as they relate to both DMSMS and PBL, let's put some shoe-leather on this. How exactly can these issues be tackled, and what are some examples of successful implementation initiatives? Below are several potential actions:

- *Understand DoD and service-specific policy and guidance related to the issue.* Familiarize yourself with DMSMS provisions in the *Defense Acquisition Guidebook* (Chapters 4 and Chapter 5), including 5.1.2.1., which states "efficient, proactive DMSMS management process is critical to providing more effective, affordable, and operational systems by proactively identifying and mitigating DMSMS issues that affect their availability and supportability." Actively addressing DMSMS concerns throughout the entire life of the program will help ensure effective life-cycle support and reduce adverse impacts on readiness or mission capability as the system evolves from a new capability to a potentially aging legacy platform.
- *Voraciously read and understand the readily available compendium of DMSMS literature and resources available.* SD-22 provides a compilation of the best proactive practices for effectively and efficiently managing obsolescence and DMSMS risks. Establishment of the DMSMS program and proper planning during design will ensure successful implementation in sustainment and throughout the life cycle.
- *Review the* DoD Product Support Manager Guidebook *(https://acc.dau.mil/psm-guidebook) and* PBL Guidebook: A Guide to Developing Performance-Based Arrangements *(https://acc.dau.mil/pbl-guidebook), both of which offer practical guidance.* The PBL guidebook provides a wealth of resources, directly addressing DMSMS as part of a robust PBL strategy:

  > For fielded weapons systems, PSMs often develop their product support strategy via a Government–Industry teaming arrangement with the OEM [original equipment manufacturer]. OEM PSPs can influence design for reliability, maintainability, and supportability and can leverage the production line for concurrent procurements, redesigns, and upgrades. The OEM is also in a position to affect obsolescence or DMSMS mitigation efforts by utilizing economic order quantity purchases with their suppliers across multiple product lines. . . . When the PBL arrangement with the PSI includes their supplier base

(PSPs), it is important for the PM [program manager]/PSM to consider how the PSPs will provide the required support, as well as the PSI's DMSMS plan for maintaining needed PSP products and expertise.

- *Take full advantage of the resources available on the DMSMS Knowledge Sharing Portal (https://acc.dau.mil/dmsms).* This online resource, managed by the DSPO-led DoD DMSMS Working Group and hosted by the Defense Acquisition University, provides myriad references related to this topic. In addition, other useful, and readily available, resources are the many DMSMS-related tools listed in the DoD Product Support Analytical Tools database (https://acc.dau.mil/psa-tools) and five web-based DMSMS training modules (CLL 201–CLL 205) available at http://icatalog.dau.mil/onlinecatalog/tabnavcl.aspx?tab=CLL). Another important resource is SAE STD 0016, "Standard for Preparing a DMSMS Management Plan" (http://standards.sae.org/std0016/). Although this commercial standard has a cost associated with it, SAE STD 0016 can help you

  > define the requirements for developing a DMSMS Management Plan… to assure customers that the Plan owner is using a proactive DMSMS process for minimizing the cost and impact that part and material obsolescence will have on equipment delivered by the Plan owner. The technical requirements…ensure that the Plan owner can meet the requirement of having a process to address obsolescence as required by Industry Standards such as EIA-4899, "Standard for Preparing an Electronic Components Management Plan," and DoD Programs as required by MIL-STD-3018, "Parts Management."

- *Document your DMSMS management plan in your program's life cycle sustainment plan (LCSP).* Also, include in your LCSP a detailed, integrated, life-cycle system schedule that is consistent with the integrated master schedule and that emphasizes the next acquisition phase.
- *Leverage the Government-Industry Data Exchange Program (GIDEP), which bills itself as a "cooperative activity between government and industry participants seeking to reduce or eliminate expenditures of resources" relative to DMSMS matters.* GIDEP serves as an important ally and readily available resource to more effectively combat the scourge of DMSMS. By making maximum use of this important capability, your program will be better positioned to leverage efficiencies available to it at all stages of the system life cycle.
- *Intentionally and thoughtfully assess, plan, develop, budget for, and aggressively implement a proactive DMSMS prevention and mitigation strategy.* Prevention (or, at the least, dramatically earlier detection) is required to affordably maintain system readiness.

- *Building on this wealth of knowledge and planning, deliberately make an aggressive and proactive DMSMS prevention and mitigation strategy an integral part of a cost-effective, outcome-based PBL product support arrangement.* Use these arrangements to incentivize the desired behaviors and outcomes. Encourage your government and industry PSIs and PSPs to be partners, rather than just stakeholders, in tackling these challenges head-on.
- *Focus on a wide range of electromechanical parts and components, rather than limiting your focus to microelectronic components.* Tie your DMSMS requirements to program performance metrics and configuration management processes. Put processes in place that seek to proactively anticipate and head off these issues before they occur in your program; however, be prepared to respond to unforeseen issues after they occur as well.
- *Don't mistakenly assume DMSMS issues will never arise or will solve themselves.* When industry serves as your PBL PSI or PSP, include specific contractual language that clearly articulates expected outcomes. (For example, the Supply Chain Solutions Division within the Naval Supply Systems Command, Weapon Systems Support, has many years of experience using several standard contractual clauses, resulting in the successful execution of cost-saving, readiness-enhancing PBL product support arrangements involving industry PSIs or PSPs.) Hold your PSIs and PSPs accountable if expectations are not met, while simultaneously leveraging available incentives to help ensure those outcomes are achieved. Both positive and negative incentives, appropriately balanced, can serve as remarkably powerful motivators.

At the end of the day, outcome-based product support arrangements can and should provide maximum flexibility in addressing the issue. Solutions can range from traditional DMSMS approaches—such as life-of-type buys, bridge buys, substitute parts, alternative sourcing, emulation, and reverse engineering—to reliability improvements, preplanned product improvement programs, materiel improvement programs, system upgrades, major modifications, technology insertion, continuous modernization, robust value engineering programs, and logistics engineering change proposals (used by the Navy in particular), to name just a few. In this way, an effective, outcome-based PBL product support arrangement—when properly structured and implemented, with the right PSIs and PSPs, and leveraging the right metrics and incentives—can be an incredibly powerful tool in your program's toolkit for reducing operating and sustainment costs and improving system readiness through the proactive prevention and mitigation of the scourge posed by DMSMS.

Sample Contractual Language

"The Contractor will have an Obsolescence and Diminishing Manufacturing Sources and Material Shortages (DMSMS) Management Plan for managing the loss, or impending loss, of manufacturers or suppliers of items, assemblies, sub-assemblies, piece parts, and material (hereafter referred to for purposes of this Clause as "parts and/or material") required for performance of this contract. At a minimum, the plan will address the following: means and approach for providing the Government with information regarding obsolescence and DMSMS issues, planned resolution of current obsolescence and DMSMS issues, parts list screening, parts list monitoring, processing Government-Industry Data Exchange Program (GIDEP) (www.gidep.org) DMSMS Alerts, processing DLA [Defense Logistics Agency] DMSMS Alerts, communication with and availability of information to the Government, means and approach for establishing obsolescence and DMSMS solutions, and plan for conducting DMSMS predictions. The Obsolescence and DMSMS Plan will be in effect for the entire term of the contract, unless otherwise agreed to by the PCO [procurement contracting officer]. Changes to the Obsolescence and DMSMS Plan will require Government approval."

"The Contractor will be responsible for managing obsolescence over the entire period of the contract, and notwithstanding any obsolescence issues or problems, for meeting all performance and other requirements of this contract. Appropriate piece part procurements to mitigate obsolescence are the responsibility of the Contractor. Stocking sufficient inventory for potentially obsolete piece parts is the Contractor's decision. The Contractor will not be entitled to any equitable adjustment as a result of obsolescence issues except in cases that require a Class I ECP [engineering change proposal]. This obsolescence management responsibility includes an ongoing review and identification of actual and potential obsolescence issues, including, but not limited to, obsolescence of components assemblies, sub-assemblies piece parts and/or material. The Contractor is responsible for all costs associated with obtaining a component for component and/or material for material replacement if and when any parts and/or material become obsolete except in cases that require a Class I ECP. For qualification of new suppliers and/or re-qualification of existing suppliers, the Contractor will perform the necessary tasks (testing, analysis, etc.) to meet current engineering drawings and technical specifications; if the Government requires additional tasks to be performed; those additional efforts shall be funded by the Government. The costs for which the Contractor is responsible include, but are not limited to, investigating part availability, interchangeability and substitutability, locating part replacement, vendor interface, engineering efforts, testing requirements, and internal drawing changes. The Contractor shall not pass any additional costs from being incurred by the Government due to obsolescence except in cases that require a Class I ECP or qualification requirements beyond current engineering drawings and technical specifications. Any configuration changes due to obsolescence will be implemented in accordance with the Configuration Management requirements of the contract. The Contractor will provide the Government with obsolescence status briefs, as part of the periodic program reviews provided for under the contract."

About the Author

Bill Kobren is the director of the Logistics and Sustainment Center at the Defense Acquisition University. He is a member of the DoD Acquisition Corps and is Defense Acquisition Workforce Improvement Act Level III certified in life-cycle logistics. Mr. Kobren has authored nearly two dozen published articles and spoken at numerous conferences and symposiums. And his Director's Blog, with more than 650 posts, is the most widely read blog on the Defense Acquisition Portal. A 2009 Distinguished Graduate from the Industrial College of the Armed Forces, Mr. Kobren was the recipient of the 2012 DoD DMSMS Individual Achievement Award.

Enhancing Productivity and Improving Program Planning with SYSPARS

By Paula Wade

SYSPARS—System Planning and Requirements Software—is a tool that enhances productivity and improves quality in program management planning. A rules-based expert system, SYSPARS contains modules for preparing various acquisition, logistics, and engineering program planning documents, including documents related to managing Diminishing Manufacturing Sources and Material Shortages (DMSMS). Subject matter experts have tested and reviewed those documents for accuracy and compliance with policy and regulations. Most of the documents that can be prepared using SYSPARS are based on DoD Instruction 5000.02, "Operation of the Defense Acquisition System"; Army Regulation 700-127, "Integrated Logistics Support"; and other DoD guidebooks.

Overview of SYSPARS

SYSPARS guides the user through the process of preparing the various documents required throughout a program's life cycle. Not only does SYSPARS remove the guesswork associated with building the documents, but it also ensures that the user does not leave out critical information or information required for the documents to comply with policy.

The user begins by selecting the specific document to be prepared. SYSPARS provides the user with a document-specific question report that enables the user to view all input prompts so he or she can gather needed information before beginning to build the document within SYSPARS. The user builds the document by answering interview-style questions, which SYSPARS presents in multiple choice, narrative, or fill-in-the-blank format. Each question in SYSPARS has a help file associated with it. The help files provide assistance in how each question should be answered and often include examples. The help files also contain links to regulations and references.

Also available in SYSPARS is a comment report that allows the user to make comments within the document (hidden from the finished product). The user can create specific comments for individual questions as well as overarching comments for an entire section.

SYSPARS generates each document in a DoD-approved format. Documents built within SYSPARS can be exported to Microsoft Word (and, in some cases, to Microsoft Project and Microsoft Excel), for further review and printing.

SYSPARS automatically shares the information provided in one document with all other relevant documents, eliminating the need for the user to reenter duplicate information in multiple documents. For example, when a planner uses SYSPARS to create a "Performance Based Logistics Strategy" in the Materiel Solution Analysis Phase of a program's acquisition life cycle, the system will automatically share information provided by the planner in the document preparation process with other documents that require the same information.

DMSMS Management and SYSPARS

DMSMS is the loss, or impending loss, of manufacturers or suppliers of items or raw materials. DMSMS issues occur, for example, when a manufacturer discontinues the production of parts needed to repair a weapon system or when raw materials are in scarce supply or are no longer available. The inability to support a system throughout its life cycle has a direct impact on materiel readiness, which, in turn, has a direct effect on the warfighters' ability to complete their missions safely.

Ensuring supportability throughout a system's life cycle requires a robust DMSMS management program, including a strategy and plan. Such a program is the most effective and efficient way to minimize the readiness risks due to DMSMS, improve overall life-cycle management, and deliver better buying power. A cost estimator for test, measurement, and diagnostic equipment had this to say about the importance of a robust DMSMS management program:

> As a cost estimator, we are always looking for ways to save money. New and obsolete parts add extra costs. A parts management system can save money for us during a system's life cycle by avoiding a new design and being able to use similar parts.

An effective DMSMS management program encompasses the entire program life cycle, starting with how the system is designed and including how the system will be sustained, in particular, how DMSMS issues will be mitigated. Project managers, engineers, and life-cycle logisticians—which constitute the DMSMS Management Team (DMT)—all play an important role in planning for DMSMS. The DMT members are responsible for ensuring timely identification and cost-effective resolution of DMSMS issues. Among the DMT's activities are gathering data and reporting on metrics that measure the effectiveness of the DMSMS management program when compared to the defined objectives.

To aid the DMT in establishing a robust DMSMS management program, SYSPARS includes a module for developing a DMSMS management plan. The module—DMSMS Plan Builder—is based on DSPO's SD-22, *Diminishing Manufacturing Sources and Material Shortages: A Guidebook of Best Practices for Implementing a Robust DMSMS Management Program*, published in August 2012.

SYSPARS's DMSMS Plan Builder has a management section that covers the DMSMS management approach, contractual requirements, and funding. In this section, the user is asked if DMSMS management activities are accomplished by a DMT. For example, if the user indicates that the activities are not accomplished by a DMT, the section requires the user to include justification as to why a DMT has not or will not be formed. This information will be included in the DMSMS management plan in the correct policy format.

The DMSMS Plan Builder also has a process section that covers configuration identification, case management, technology road map, and data collection and metrics. The user is presented with questions concerning, for example, data requirements, stakeholders, and an indentured bill of materials. In addition, the user has the option of inserting a DMT process flow chart.

Use of the SYSPARS DMSMS module has enabled DMTs to develop effective and compliant DMSMS plans, saving time and money. As a senior logistician at a defense contractor said:

> I used the SYSPARS DMSMS module to develop an obsolescence plan for a radar interface unit on a Bell 407 helicopter modification as part of a foreign military sales contract. The SYSPARS DMSMS module gave me a systematic methodology to develop the obsolescence plan which ensured taking into account all of the regulatory requirements.

Those two documents, along with SAE GEIA-STD-0007, "Logistics Product Data," contain the information needed by logisticians to establish viable, cost-effective support structures that reduce risk and enable them to meet performance and schedule requirements, ensuring the sustainment of all weapon systems throughout their life cycle.

In 2013, new features were added to SYSPARS. The SYSPARS DMSMS Plan Builder now has capabilities to include a DMT charter. The charter describes the planning, policies, and guidelines used during the DMSMS management process. Although a charter is not formally required, programs are highly encouraged to establish a charter to clearly define roles as well as authorize processes and procedures for DMSMS activities. Also, users can now add a signature approval and revision page to the DMSMS management plan. These new pages provide authority and revision history for the plan, which is increasingly important as program life cycles continue to be lengthened.

In addition to the management and process sections, the DMSMS Plan Builder includes prefilled abbreviations, guidance, and reference document pages.

After the user has answered all the questions in the DMSMS module, SYSPARS generates a complete DMSMS management plan that adheres to current DoD policies and regulations.

Summary

Integrated product support managers, program managers, and a wide range of support contractors use SYSPARS to build policy-compliant documents throughout a program's life cycle. By removing the guesswork associated with document creation, SYSPARS saves time and money for users' organizations. The majority of SYSPARS users are Army based, but a significant number of users are from other military services and DoD agencies.

The software for SYSPARS is free. To register for SYSPARS, please visit https://www.logsa.army.mil/lec/forms/register/. After registering and receiving a password and URL, the user can download the software.

SYSPARS training is provided monthly at Redstone Arsenal, Huntsville, AL. The training, which is free, helps the user become familiar with the functionality of SYSPARS through a presentation and hands-on exercises.

About the Author

Paula Wade is a logistics engineer in the Automation Division of the U.S. Army Materiel Command's Logistics Support Activity, Redstone Arsenal, AL. She has a combination of 7 years of DoD and industrial experience.

Status of the DMSMS Solutions Cost Survey

By Tracy Daubenspeck

Diminishing Manufacturing Sources and Material Shortages (DMSMS)—defined as the loss, or impending loss, of manufacturers, suppliers of items, raw materials, or software—has a large impact on DoD programs, largely because of the long life cycles of DoD systems. The DMSMS community has made an effort over the years to define a standard set of DMSMS solutions, and their associated costs, that can be applied to all DMSMS issues. The first effort was completed by the Defense Microelectronics Activity (DMEA), as documented in *Resolution Cost Factors for Diminishing Manufacturing Sources and Material Shortages*, published in February 1999. That report focused on solutions at the electronic component level, which was the predominant focus of DMSMS management at the time. DMSMS management efforts have expanded over the intervening 15 years to include commercial off-the-shelf equipment, materials, mechanical items, and software, resulting in the need to revise the set of solutions used in DMSMS management.

The 2011 DMSMS conference hosted a town-hall style meeting of DMSMS practitioners. Those present proposed that a group be established to redefine the standard DMSMS solutions to meet the expanded needs of the DMSMS community. The DoD DMSMS Working Group established a committee to take on that task. The solutions committee comprised 21 individuals from the Army, Navy, Air Force, and industry. The committee met regularly beginning in November 2011 and reported its results to the DMSMS Working Group at the end of February 2012.

The committee's work was presented at the 2012 DMSMS conference and published in the August 2012 version of SD-22, *Diminishing Manufacturing Sources and Material Shortages: A Guidebook of Best Practices for Implementing a Robust DMSMS Management Program*. The committee also determined that the existing definition of cost avoidance was still valid. That definition is as follows:

> DMSMS cost avoidance is the difference between the cost of the implemented solution and the cost of the next more costly viable solution. Whenever possible, actual costs should be used. It should be noted that not all DMSMS solutions can be applied to every DMSMS problem. Only those solutions that are possible to implement are viable.

Once the new solutions were approved and in place, the old costs of DMSMS issues could no longer be directly tied to a solution. The solutions committee recommended that the DMSMS Working Group sponsor a new survey, similar to the 1999 DMEA survey, with the purpose of establishing the average costs that DoD incurs for implementing these solutions. Knowing those costs allows programs to estimate solution costs for emerging DMSMS issues, develop budgets for resolving future issues, provide a basis for evaluating proposals for resolving DMSMS issues, and provide a mechanism for estimating DMSMS cost avoidance.

To determine average costs, the DMSMS Working Group established a cost survey committee, comprising some of the members of the solutions committee and a survey expert. Like the solutions committee, members of the cost survey were from all of the services and from industry. The survey committee began its work in July 2012 and completed its work in June 2013. The result was a survey instrument that attempts to define DMSMS costs at a greater level of detail compared with the previous survey. It allows cost data to be broken down by service, operating environment, and lower-level cost elements such as engineering and logistics costs.

The survey instrument was given to the Department of Commerce, which is responsible for conducting such surveys. The Commerce Department further refined the survey instrument and, working with the survey committee and the DMSMS Working Group, developed a list of programs and companies to survey. The survey was launched in February 2014 and was completed in August 2014.

A subset of the survey committee, as well as a team of analysts, has been established to review the responses, normalize the data, develop average costs, and publish the findings. The committee plans to publish the results at the 2014 DMSMS conference and in the 2014 version of the SD-22. The committee expects to publish its final report by year's end.

About the Author

Tracy Daubenspeck chaired the DoD DMSMS Working Group's solutions committee established to redefine the standard DMSMS solutions as well as the cost survey committee, and he is a co-chair of the DoD DMSMS Working Group's problem and solutions standing committee. Mr. Daubenspeck is an active participant in the Naval Sea Systems Command's DMSMS Working Group where he works to develop DMSMS management best practices. Mr. Daubenspeck is the operations lead for the Obsolescence Management Division at the Naval Undersea Warfare Center, Division Keyport. In that capacity, he aids in managing the Obsolescence Management Information System (OMIS™), oversees the development and management of the team's operational processes, develops DMSMS management plans for supported programs, and provides operational support for the division's team leads. Mr. Daubenspeck was a major contributor to the revised SD-22 DoD DMSMS guidebook that was published in 2012.

Software Obsolescence

It's Too Important to Be Overlooked

By Jay Mandelbaum and Christina Patterson

A Diminishing Manufacturing Sources and Material Shortages (DMSMS) issue is the loss, or impending loss, of manufacturers or suppliers of items, or raw materials, or software.[1] Another aspect of DMSMS is when something, although still available commercially, no longer does what it was intended to do because of hardware, software, or requirements changes to the system. This is often referred to as functional obsolescence. This article discusses how software obsolescence should be considered in the "prepare," "identify," "assess," and "analyze" phases of DMSMS management, articulated in DSPO's SD-22, *Diminishing Manufacturing Sources and Material Shortages: A Guidebook of Best Practices for Implementing a Robust DMSMS Management Program*.

Considerations for the "Prepare" Phase

The prepare phase establishes the strategic underpinning for DMSMS management. A risk-based approach should be used to determine the importance of software obsolescence to the program and its DMSMS management effort. A program should assign software obsolescence a relatively high priority if its system is heavily dependent on commercial off-the-shelf (COTS) software. For an older system primarily using custom software for mission-critical applications and using COTS software only for user interfaces, a program may choose to assign a lower priority to software obsolescence as long as no changes are anticipated. If changes are anticipated, software obsolescence priority is dependent upon access to the critical human skills needed.

A software subject matter expert should be on the DMSMS Management Team (DMT). Even if software obsolescence is not a high priority, hardware resolutions have the potential to affect software.

The ability to use software often requires a license or agreement. Although maintaining software licenses and maintenance agreements is not normally a DMT responsibility, the DMT may want to take responsibility if software is a critical obsolescence issue for the program. If a license management group is already doing this work, the DMT should open a line of communication with that group to be cognizant of the status.

Monitoring software obsolescence may be an important consideration in determining the amount of funding needed for DMSMS management operations, particularly for information systems heavily dependent on COTS software.

Considerations for the "Identify" Phase

The identify phase determines what should be proactively monitored. All software items should be identified. Sources for data on the software elements incorporated into a system design include

- bills of material,

- configuration management documents,
- a data rights disclosure letter if it is a requirement on the contract, and
- a software license management group, if one exists.

For each software element identified, the program should capture its system's software interdependencies (the software and hardware that depend on it and the software and hardware on which it depends). Software interdependencies may not be hierarchical; there can also be cross-system relationships. An understanding of these relationships is best achieved from discussions with systems engineers or software developers or may be identified in interface control documents.

Table 1 shows where proactive monitoring for software obsolescence makes sense, from a risk-based perspective, for the most common categories of program-specific software. The columns in the table represent software obsolescence mechanisms. The first three columns of the table are grayed out, because proactive monitoring in these specific instances is not necessary.

Table 1. Framework for Determining the Applicability of Proactive Software Obsolescence Management

Category	Software obsolescence mechanism			
	Lower order			First order
	Hardware changes	Software requirements changes	Proactive software upgrades	Diminished ability to use software
COTS software[a]				Applicable
Custom software[a]				Applicable
Open source software[b]				Applicable
GOTS software[b]				Applicable
COTS firmware				Applicable
Custom firmware				

[a]Includes interface software, which moves, translates, or displays data, e.g., custom drivers for printers or middleware for interfacing COTS and custom applications.
[b]Encompasses operating system, middleware, and application software.

Hardware changes are driven by refreshing hardware technology, implementing a hardware DMSMS resolution, or making another hardware requirements change. Software obsolescence could be a second-order effect of a hardware resolution, refreshment, or requirements change, but those changes must take any derivative software obsolescence into account, leaving no additional implication for proactive software obsolescence management. Similarly, implementation of a change in software requirements (column 2) or

proactive software upgrades (column 3) would also naturally include the consideration and resolution of any derivative software functional obsolescence; again, there are no implications for proactive software obsolescence management.

Proactive management should be done as a function of the specific program's strategic priorities and software risks (including the health of the software vendor). Below is a discussion of proactive software obsolescence management considerations associated with a diminished ability to use software (column 4) for each category of software affected:

- *COTS operating system, middleware, and application software.* COTS software may be monitored primarily by keeping track of licenses and support agreements, analyzing technology and product road maps and projected new release information, participating in user groups, tracking new interface standards, and frequently surveying vendors to understand the rapidly changing market and to evaluate competitive products as a future replacement option. Just as qualified sources for hardware items should be identified, so should qualified sources of support for each element of software. Another aspect of proactive obsolescence management for COTS software is information assurance. DoD security bulletins may also be monitored.
- *Custom operating system, middleware, and application software.* Because licenses do not usually apply to custom applications, the key information that can be tracked is viable continuation of support, which could consist of both contractual and in-house elements. Surveys may not be the best mechanism to obtain that information. Program office sustainment personnel may be in a good position to identify potential software obsolescence risks.
- *Open source operating system, middleware, and application software.* Proactive software obsolescence management may consider monitoring changes made to the open source version because using the newer version of the software may be necessary to support changes to the older code being used by the government. Licensing may not be an issue, but the terms and conditions for using the open source software should be reviewed by a legal team because, for example, there may be a requirement to provide any modifications to the entire open source community.
- *Government off-the-shelf (GOTS) operating system, middleware, and application software.* GOTS software is a subset of COTS software; therefore, the same considerations may apply. Licensing is unlikely to be an issue. A vendor survey would be conducted with the appropriate government entity.
- *COTS firmware.* An item may be a combination of hardware and embedded software (firmware). The item becomes obsolete when either the hardware or the firmware becomes obsolete in a way that affects the system. COTS firmware changes may be tracked by monitoring the item itself as a functional group. If the hardware item is monitored with a predictive tool, it may be important, depending on the risk to the system, to include that hardware item in a vendor survey.

- *Custom firmware.* There are no obvious considerations for proactive software obsolescence management of custom firmware. The program should be aware of changes to the firmware it controls.

Once data on the status of the software are collected, software health assessments should be created. These assessments should show the projected time frames for potential software obsolescence risk (including license and maintenance) for all of the monitored software.

Considerations for the "Assess" Phase

The SD-22 bases impact assessment on the answers to three questions. These questions apply only to first-order software obsolescence under the assumption that derivative obsolescence will be resolved as part of the changes implemented from hardware changes, requirements changes, or technology upgrades.

- *Should a resolution to this problem be pursued?* Software considerations include the following:
  - Loss of a software license will usually have an immediate impact. Assuming the software is mission and/or safety critical, a resolution should be pursued. Similarly, an information assurance issue with the software has an immediate impact, because the software can no longer be used without a waiver.
  - Loss of software support is a more complex issue to resolve. If obsolete software has never been changed and no errors have been uncovered, then it also may be safe not to pursue a resolution for some period of time. The software may continue to operate correctly until the end of system life as long as the underlying layers can be sustained. Consequently, the cost of changing the software becomes a consideration.
  - In the case of firmware changes, it is necessary to determine the effect if a new functional group is introduced into the system. A resolution should be pursued on the basis of the risk in making changes in the functional group application.
- *Which problem should be addressed first?* Even though software can function for a long period of time with no support and without any adverse impact if underlying layers are stable, the loss of a software license should be addressed immediately. The same holds true if software no longer meets information assurance requirements or a firmware change affects system operation. Consideration should be given to the number and frequency of updates, the number of different versions currently being used on the system, or the age of the versions in use in determining the priority under a loss of support situation.[2]
- *At what level should a resolution be applied?* Because software relationships are seldom linear, the answer to this question should be determined on a case-by-case basis.

Considerations for the "Analyze" Phase

The analyze phase selects the most cost-effective resolution for the DMSMS issue. Table 2 shows software examples for each type of resolution.

Table 2. Examples of Software Resolutions

Resolution type	Example
No solution required	It is determined that firmware embedded in obsolete hardware will remain functional until the hardware is replaced and existing hardware stocks are sufficient to meet system requirements through the end-of-service date.
Approved item	The media used to store the software is no longer readable (e.g., floppy disks). The software is digitally ported to a CD.
Life-of-need buy	A license downgrade is negotiated with the software vendor, which enables the users to expand or extend authorized use of an older product by purchasing additional licenses of the latest version and applying those licenses to the older product until it is retired.
Repair, refurbishment, or reclamation	The original vendor allows the customer to purchase the source code and the development tools to maintain it and will provide software engineering support for a fee.
Extension of production or support	A third party is contracted to continue support on a software application.
Simple substitute	Current software is rehosted to operate correctly with new application hardware or software.
Complex substitute	Another software product is used to replace the obsolete software.
Development of a new item or source	The software application is redeveloped because of an obsolete compiler.
Redesign–next higher assembly	The operating system of a single board computer is obsolete and no longer supported by the manufacturer. A replacement board that runs the new version of the operating system is available and will not require changes to other equipment. Some of the associated software must be modified to accommodate the new operating system.

[1]The term "software" encompasses COTS, custom, or any combination of firmware, operating systems (including kernel, device drivers, etc.), middleware, and application programs.

[2]Software can degrade through configuration incompatibilities. Although all of the individual software elements may be fine, over time, the combination of these elements can become incompatible and lead to system failure.

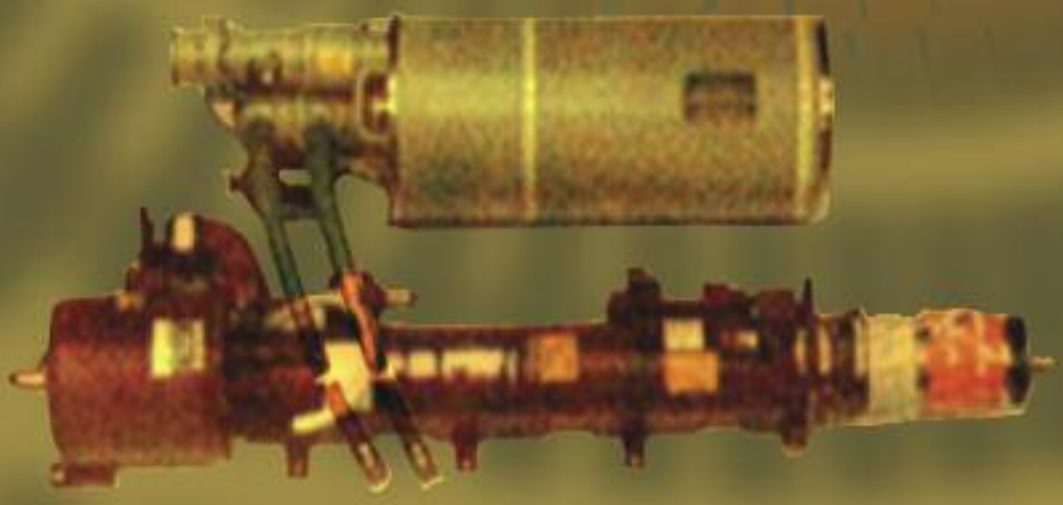
About the Author

Dr. Jay Mandelbaum and Christina Patterson are research staff members at the Institute for Defense Analyses. The following individuals contributed to the preparation of the material from which the article was extracted: Jeremy Beck and Amy Hess, Naval Surface Weapons Center Crane; Tracy Daubenspeck and Dennis Summers, Naval Undersea Weapon Center Keyport; Karen Gordon and Gene Porter, Institute for Defense Analyses; Peter Sandborn, University of Maryland; and Timothy Zitkevitz, Lockheed Martin.

DMSMS Case Study

Material Shortages in DoD Microwave Amplifier Applications

By Bryan Mitsdarffer



Over the years, issues with the supply of beryllium, beryllium oxide, thoriated-tungsten wire, rare-earth metals for permanent magnets (samarium-cobalt), and, recently, tungsten-rhenium wire have put the availability of microwave tubes at risk. Although the microwave tube industry has resolved many of its Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues, some issues remain and new DMSMS issues are likely to arise. Because the DoD budget is expected to shrink, more proactive material management is necessary to ensure continued success in abating both the impending loss of sources and any shortages of materials. To mitigate DMSMS issues, more communication is necessary between the material providers and the end users.

Background

Microwave tubes, which are found on almost every land-based, marine-based, and airborne platform, are designed to meet a variety of unique requirements. As illustrated in Figure 1, microwave tubes are manufactured in a variety of shapes and sizes to support the specific requirements and the platform.

Microwave tubes are a critical technology used in DoD weapons systems (70 percent of DoD weapon systems have active emitters) even though solid-state technology continues to be the technology of choice in new systems. The transition of technology in DoD weapon systems has been occurring for decades and will likely take several more decades to complete, leaving DoD with a small, yet critical, industrial base to support many DoD weapons system needs. DoD procurement represents about 80 percent of the U.S. industrial base sales.

Figure 1. Examples of Microwave Tubes

Microwave tubes are high-power, high-vacuum devices made of refractory metals, rare-earth metals, and specialized materials and parts. As many other industries have experienced, the changing international market for these materials has caused variations and increases in price and loss of U.S. sources. In some cases, those losses require new material solutions. Low-volume usage, the need for specialized processing, and the need for consistency in material properties have added to the difficulty of maintaining sources of the materials used in microwave tubes.

The microwave tube industry has been addressing its DMSMS issues with the help of U.S. government programs like the Defense Production Act (Title III), Small Business Innovation Research (SBIR)/Small Business Technology Transfer, and ManTech; Defense Logistics Agency programs (Science and Technology, Industrial Base Innovation Fund, Warstopper, Working Capital Fund, and Strategic Materials); and other DoD programs. Each of those programs has different rules and requirements, and each could, in and of itself, be the topic of an article. However, the intent of this article is to address the potential for leveraging those programs through increased communications along the supply chain. Such an effort could help sustain manufacturers, help manufacturers improve their manufacturing capabilities, or both.

Current DMS Issue: Cathode Manufacturing and Tungsten-Rhenium Wire

Tungsten-rhenium wire is used extensively in the manufacture of heaters for thermionic cathodes used in most microwave tubes. The economic reality of today's market is that, in some instances, the old cost drivers of labor, yield, and scrap have taken a back seat to the cost of materials, and the realities of the global economy are causing a loss of U.S. industrial sources. In the past, the increase in the cost of materials was largely due to inflation, which was relatively predictable year to year. Now, however, costs change day to day. A good portion of the cost volatility can be attributed to economic globalization and the rapid increase in industrialization in Asia and developing nations. That increase has had and continues to have a dramatic effect on the demand side of supply. The demand curves are creating the volatility in the materials markets and are having a particularly dramatic effect on the materials used in the manufacture of vacuum electron devices.

The demand for tungsten has been rising; tungsten pricing was relatively stable from 2005 to late 2010 when it increased significantly due to continued growth in demand and to market pressures. Tungsten pricing is likely to continue to increase as China continues to decrease the export of raw materials.

Rhenium is easily the rarest of all the refractory materials; 120 tons of copper ore typically yield only 1 gram of this material. It, like molybdenum, has seen significant spikes in demand for industrialization and aerospace uses, and its demand has affected pricing. Rhenium's main use (70 percent) is for mixing with high-temperature superalloys used in jet engine parts. The microwave tube industry uses rhenium mixed with tungsten to form wire, which is wound into a variety of configurations for heater applications and flattened into ribbon for radio frequency helices.

The total usage of tungsten-rhenium wire by the microwave tube industry is very small as compared to its usage of pure tungsten or molybdenum-based wire, but the tungsten-rhenium wire is critical to the operation of radio frequency helices. Unfortunately, the

microwave tube industry is faced with a serious DMSMS issue due to the loss of its only source for the wire.

Microwave Tube Industry DMS Working Group

After the 2012 International Vacuum Electronic Conference, a working group was established to cooperatively solve the loss of the source of tungsten-rhenium wire. The group consisted of personnel from the majority of the microwave tube companies affected by the loss of the wire's source, including H. Cross Company, Union City Filament Corporation, Semicon Associates, Spectra-Mat, Inc., Communications and Power Industries, e2v, L-3 Communications, Northrop Grumman Corporation, Photonis USA, Teledyne Technologies, Inc., TMD Technologies, Ltd., Thales Defense and Security, Inc., and Naval Surface Warfare Center Crane.

The group conducted market research to find replacement U.S. and foreign sources for tungsten-rhenium wire and improved the specification for the wire. In addition, the group is developing a uniform qualification plan to implement for future additional sources at the electron gun and helices subassembly levels in an attempt to minimize costs and expedite qualification of a new wire source before the end of 2014.

Government Involvement

After becoming aware, in early 2012, of the impending loss of the industry's source of tungsten-rhenium wire, efforts were made to initiate SBIR projects to look for innovative methods for manufacturing cathode heaters using new technologies and to identify innovative ways to implement lower cost manufacturing processes for tungsten-rhenium wire. Three different SBIR phase 1 projects were awarded, which provided funding to move forward on both developing concepts for new techniques and improving existing techniques to mitigate the loss of the existing source.

In addition, efforts were made to engage personnel from the Office of the Secretary of Defense, Manufacturing and Industrial Base Policy, and from the Defense Production Act Title III Program Office with the need to find a new source for the tungsten-rhenium wire. Those efforts were rewarded in February 2014 when a solicitation was opened to enable a Title III sustainment project to assist with reinstituting a U.S.-based company to manufacture tungsten-rhenium wire to support the microwave tube industry. A contract was awarded in August 2014.

Conclusion

As global economies continue to grow, pressures on the supply and price of the materials used in the manufacture of microwave tubes will not abate. Although issues related to pending price increases are likely unsolvable, progress has been made to resolve the DMS

issue involving tungsten-rhenium wire and to start a dialogue within the microwave tube industry on how to deal with these issues and the issues to come.

Looking forward, increased open communication is needed throughout the entire supply chain—from subtier sources to end-item manufacturers to the final end user—to mitigate DMSMS risks. Especially when the end user is DoD, it is possible that a variety of programs can be brought to bear over time to address the problems encountered to ensure the source of supply to the warfighter. The earlier DMSMS issues and concerns can be brought to light, the more likely they can be successfully addressed.

About the Author

Bryan Mitsdarffer is the DoD executive agent for microwave technologies and is an employee of the Radar Technologies Division, Global Deterrence and Defense Department, Naval Surface Warfare Center, Crane, IN. Mr. Mitsdarffer provides leadership within comprehensive life-cycle management functions to provide safe, reliable, and effective microwave technologies components, including solid state and vacuum electron (microwave tube) devices, for military electronic warfare, sensors, and communication systems.

The author wishes to thank the people and companies currently engaged in the microwave tube industry working group attempting to resolve the issue of losing the microwave tube industry's sole qualified source for tungsten-rhenium wire.

Program News

Major General Edvardas Mažeikis Is New NSO Leader

On July 1, 2014, Major General Edvardas Mažeikis became the director of the NATO Standardization Office (NSO), formerly, the NATO Standardization Agency (NSA). MG Mažeikis replaces Mr. Cihangir Aksit, who left office in June 2014 after serving as NSA's director for 3 years.

MG Mažeikis brings a wealth of knowledge to the NSO, which, in the post-NATO Agency Reform environment, is responsible for supporting all of the standardization domains: operational, materiel, and administrative. His significant expertise and experience—in military operations that span the globe, armaments, procurement, system modernization, standardization development and implementation, defense capabilities, and other areas—provide him with the capacity to support standardization, under a single umbrella, to meet the operational requirements of NATO-led operations.

For 30 years, MG Mažeikis served in the Lithuania Air Force in wide-ranging roles and with varying levels of responsibility that have prepared him to lead the NSO. Before accepting this new post, he was the commander of the Lithuanian Air Force responsible for operational issues, personnel, and financial budget planning. Some 1,200 airmen and civilians served under his command. Previously, he served as the Chief of Defence Staff at the Ministry of National Defence, where he managed the Defence Capabilities Planning Department and the Armaments and Communication Systems Department. He also controlled the standardization process in the Lithuanian Armed Forces and implementation of NATO standardization agreements. In addition, as the executing functions officer in the Lithuanian National Armaments Directorate, his responsibilities covered armaments strategic and policy issues, restructuring of the Lithuanian defense infrastructure, and implementation of NATO long-term requirements. In that capacity, he participated in the NATO Conference of National Armament Directors and the European Defense Agency Steering Board.

Among his other assignments, MG Mažeikis served as the commandant of the Lithuanian Military Academy; the Lithuanian military representative to NATO and European Union military committees, supervising staff officers engaged in standardization working groups; commanding officer of Siauliai Air Base; and various staff assignments at the Lithuanian Air Force Headquarters, mainly dealing with operational and planning issues. He began his career, after graduating from the Lithuanian Air Force Military Academy in 1983, as a fighter pilot, flight leader, and deputy squadron commander in a fighter regiment.

DAU Launches a New Continuous Learning Module on DMSMS

In December 2014, the Defense Acquisition University (DAU) will be launching a new continuous learning module (CLM), "Diminishing Manufacturing Sources and Material Shortages: What Program Management Needs to Know and Why." This new CLM, which will replace the existing "DMSMS for Executives" CLM, will focus on two objectives:

- Why DMSMS management is important to program management
- What steps program management can take to enable successful implementation of robust DMSMS management processes.

In the first section of the CLM, the importance of robust DMSMS management is highlighted by describing the impact of poor or reactive DMSMS management and debunking several common DMSMS myths. Falling victim to any of these myths and not pursuing robust DMSMS management practices will have severe negative repercussions on a program's cost and schedule and the readiness of its system.

Given that the question isn't "if" a program will face DMSMS issues, but "when," there are actions that program management can take to best position a program to minimize the negative impacts of DMSMS issues. These actions begin with establishing the strategic underpinnings for robust DMSMS management, including the appointment of DMSMS management team (DMT) members, the approval of DMT decisions that drive a risk-based DMSMS management plan, and the determination of program leadership involvement. Among other actions that program management should pursue are (1) establishing a strong foundation for robust DMSMS management, for example, data, tools, appropriate contractor support, independent subject matter expert involvement, and a centralized linkage to DMSMS activities and best practices in other programs; (2) ensuring that DMSMS management and resolutions are fully funded; (3) making DMSMS management a

high priority in the program office and with the prime contractor; (4) linking DMSMS health assessments to product road maps; and (5) obtaining DMSMS comments on all designs, redesigns, and design reviews.

GIDEP Provides Two New-User Training Clinics

The Government-Industry Data Exchange Program (GIDEP) is a DSPO-managed program established to promote and facilitate the sharing of technical information among government agencies and industry partners to increase system safety, reliability, and readiness and to reduce system development, production, and ownership costs. GIDEP will be conducting two new-user training clinics—one on the West Coast and one on the East Coast—designed specifically for GIDEP members who have been in the program for 3 years or less. It is the hope of the GIDEP Program Office that by providing two clinics, new members who might not be able to travel to the normal West Coast clinic will be able to attend the East Coast clinic. The West Coast new-user training clinic was held November 4–6, 2014, at the Best Western Golden Sails in Long Beach, CA. The East Coast training clinic will be held May 19–21, 2015, at LMI in Tysons Corner, VA. To further facilitate attendance, the GIDEP Program Office is researching the feasibility of hosting additional clinics in the Northeast, Midwest, and Southeast beginning in 2016.

The clinics are conducted in a track-style format, enabling all participants to attend every presentation, as well as to receive adequate hands-on training. They also receive in-depth training in database searching and utilization of the Participant Utilization Reporting System. On the last day of each new-user training clinic, the GIDEP Operations Center offers additional hands-on training.

For further information, or to register, go to www.gidep.org, log in, and click "Events."

Events

Upcoming Events and Information

October 27–30, 2014, Springfield, VA

17th Annual NDIA Systems Engineering Conference

This year's Systems Engineering Conference will be held at the Waterford Conference Center in Springfield, VA. The focus of the conference is on improving acquisition and performance of defense programs and systems, including network-centric operations and data/information interoperability, systems engineering, and all aspects of system sustainment. The conference is sponsored by the Systems Engineering Division of National Defense Industrial Association (NDIA) and is supported by the Deputy Assistant Secretary of Defense for Systems Engineering, the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, and the Office of the DoD Chief Information Officer. For more information, please go to www.ndia.org and click "Meetings and Events."

December 1–4, 2014, San Antonio, TX

2014 DMSMS Conference

The 2014 Diminishing Manufacturing Sources and Material Shortages (DMSMS) Conference will be held at the Grand Hyatt San Antonio and the Henry B. Gonzalez Convention Center in San Antonio, TX. Details on the technical program are still being worked out, but the event promises to be top-notch in every way. For more information on the event, go to dmsmsmeeting.com.

May 19–21, 2015, Tysons Corner, VA

GIDEP New-User Training Clinic

The Government Industry Data Exchange Program (GIDEP) will be conducting a new-user training clinic designed specifically for GIDEP members who have less than 3 years in the program. This clinic, scheduled for May 19–21, 2015, will be held at LMI in Tysons Corner, VA. GIDEP's new-user clinics are conducted in a track-style format, enabling all participants to attend every presentation, as well as to receive adequate hands-on training. They also receive in-depth training in database searching and utilization of the Participant Utilization Reporting System. On the last day of each new-user training clinic, the GIDEP Operations Center offers additional hands-on training. For further information, or to register, go to www.gidep.org, log in, and click "Events."

People

People in the Standardization Community

Welcome

Brent Bolner resumed his duties as the Naval Sea Systems Command's (NAVSEA's) Diminishing Manufacturing Sources and Material Shortages (DMSMS) manager after returning from serving with U.S. forces in Afghanistan during 2013–14. He was honored for his service with the Secretary of Defense Medal for the Global War on Terrorism (Afghanistan), the NATO International Security Assistance Force Operation (Afghanistan) medal, and the Army Outstanding Civilian Service Medal. Mr. Bolner has 30 years of experience in multiple disciplines, including combat systems engineering, information technology, information assurance, test and evaluation, integrated logistics support, and program management. He is an alumni of the Naval Surface Warfare Center (NSWC), Port Hueneme Division, where he was on shock trials of the USS *Mobile Bay* (CG-53). He was also on the government design team as a lead for the Integrated Product Data Environment for the Navy's USS *San Antonio* class in New Orleans, LA, and was a lead in information assurance for the Navy's *America*-class (LHA 6) shipbuilding program.

Robin Brown became the DMSMS national lead for Naval Air Systems Command (NAVAIR) on December 6, 2013. The recipient of the 2013 DoD DMSMS Individual Achievement Award, she serves as a focal point for NAVAIR applying subject matter expertise in DMSMS. Ms. Brown recently established a centralized Obsolescence Management Team for NAVAIR program offices. Her drive, reputation, and expertise make her a sought-after advisor to the highest levels of DoD and Navy obsolescence leadership.

Ted Bujewski is the Defense Priorities and Allocations System program manager and an industry analyst sector lead at Manufacturing and Industrial Base Policy within the Office of the Under Secretary of Defense (OUSD) for Acquisition, Technology and Logistics. As a sector lead, his areas of expertise include DMSMS, communications, hardware and software, and cybersecurity. Before coming to OUSD, Mr. Bujewski was the chief of Industrial Base and Supply Chain Management for NASA Human Space Flight.

Tabitha Horrocks recently assumed duties as the Aviation and Missile Research Development and Engineering Center's (AMRDEC's) primary point of contact for DMSMS standardization. Ms. Horrocks is the aviation team lead in the Product Availability/Obsolescence Management Branch at Redstone Arsenal. She is responsible for providing guidance and oversight in the development of a standardized proactive life-cycle obsolescence management program across all Program Executive Office Aviation platforms and external programs such as the Coast Guard.

Daniel Horstman is replacing Nova Carden as the NSWC, Crane Division, representative to the DoD DMSMS Working Group and co-chair of the Processes Committee. He was a member of the Integrated Warfare Systems 2.0 DMSMS Enterprise Initiative that received the 2013 DMSMS Team Achievement Award. Mr. Horstman now serves as a task manager for Crane's Supply Chain Risk Management Branch.

People

People in the Standardization Community

Doug Killey serves as performance learning director for materiel readiness for the Logistics Center at the Defense Acquisition University, where he develops and presents various training curricula regarding acquisition, product support, and sustainment of DoD weapons systems.

John Palmer, from the Marine Corps Systems Command, has been named as the command's DMSMS lead. In this capacity, he is responsible for reestablishing the Marine Corps DMSMS working group, which will identify gaps in policies, processes, and tools for Marine Corps ground systems. Mr. Palmer also shares responsibility as the Marine Corps Lead Engineering Support Activity for Defense Logistics Agency (DLA) Form 339 resolutions.

Jason Voeltz is replacing Vicky Skiff as the technical project manager at the Naval Undersea Warfare Center (NUWC), Keyport Division. He has been the deputy technical project manager since 2009 and a key member of the DoD DMSMS Working Group. Mr. Voeltz was a key contributor to the industry standard for developing DMSMS management plans and the revised SD-22 guidance document for DMSMS management. He also serves as a co-chair of the DoD DMSMS Working Group's Process Committee.

Farewell

Mitchell Canty recently accepted a new position within DLA's Strategic Acquisition Program Directorate. Mr. Canty will provide industrial base management and industry analyses, technical assistance and guidance to facilitate management effectiveness and efficiency and to improve customer services, and War Stopper Program leadership. He will maintain a close working relationship with and will support the standardization community. Mr. Canty has previously provided leadership within the Value Engineering Support Team, as the team lead within DLA's DMSMS Program Office, and as a product assurance specialist within DLA Aviation, as well as the land and maritime supply chains. Mr. Canty's experience includes 25 years in the private sector as founder and president of a multinational design, engineering, and manufacturing support organization servicing both the private sector and government agencies.

Nova Carden has accepted a position as manager of the new Electrical Support Equipment Engineering Branch of NSWC Crane's Platform and Launch Systems Division. Her role as a key contributing member and committee chair for the DoD DMSMS Working Group has been assigned to Mr. Daniel Horstman. Ms. Carden managed Crane's Supply Chain Risk Management Branch for 2 years where she was one of the champions of the revised SD-22 guidebook and the technical sessions lead for the DMSMS Conference. She will be missed, but we wish her well in her new challenge.

Lynne Marinello was recently accepted as a member of the Senior Service College. Ms. Marinello was chief of the Army's Electronics Obsolescence Management Branch within

People

People in the Standardization Community

AMRDEC's Manufacturing Science and Technology Division. She provided management and technical direction in support of more than 20 aviation and missile program management offices across the Aviation and Missile Command, as well as other organizations and services. She is widely recognized as a leader and a subject matter expert in electronics obsolescence management throughout DoD and the industrial base community. For the last 5 years, she led the branch to achieve more than $535 million in cost avoidance. We wish her well in her future endeavors.

Victoria Skiff recently retired from federal service after 32 years working at NUWC Keyport. She was the branch manager for the *Virginia*-class Tech Refresh Group while she was part of the NAVSEA Logistics Team of the Year in 2006. She later took on the role of technical project manager for all obsolescence projects across Keyport where she was responsible for molding and shaping Keyport into a world-class obsolescence management team. During her tenure as the technical project manager, she was a key member of the DoD DMSMS Working Group. In 2011, she was awarded an Individual Achievement Award in recognition of her superior leadership and contributions in the DMSMS community, and in 2013, she received Keyport's Lifetime/Career Achievement Award for her dedication. She will be missed, but we wish her well in the next chapter of her life.

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 2014	NATO/International
January/March 2015	Non-Government Standards
April/June 2015	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, STOP 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.


DEFENSE STANDARDIZATION PROGRAM
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