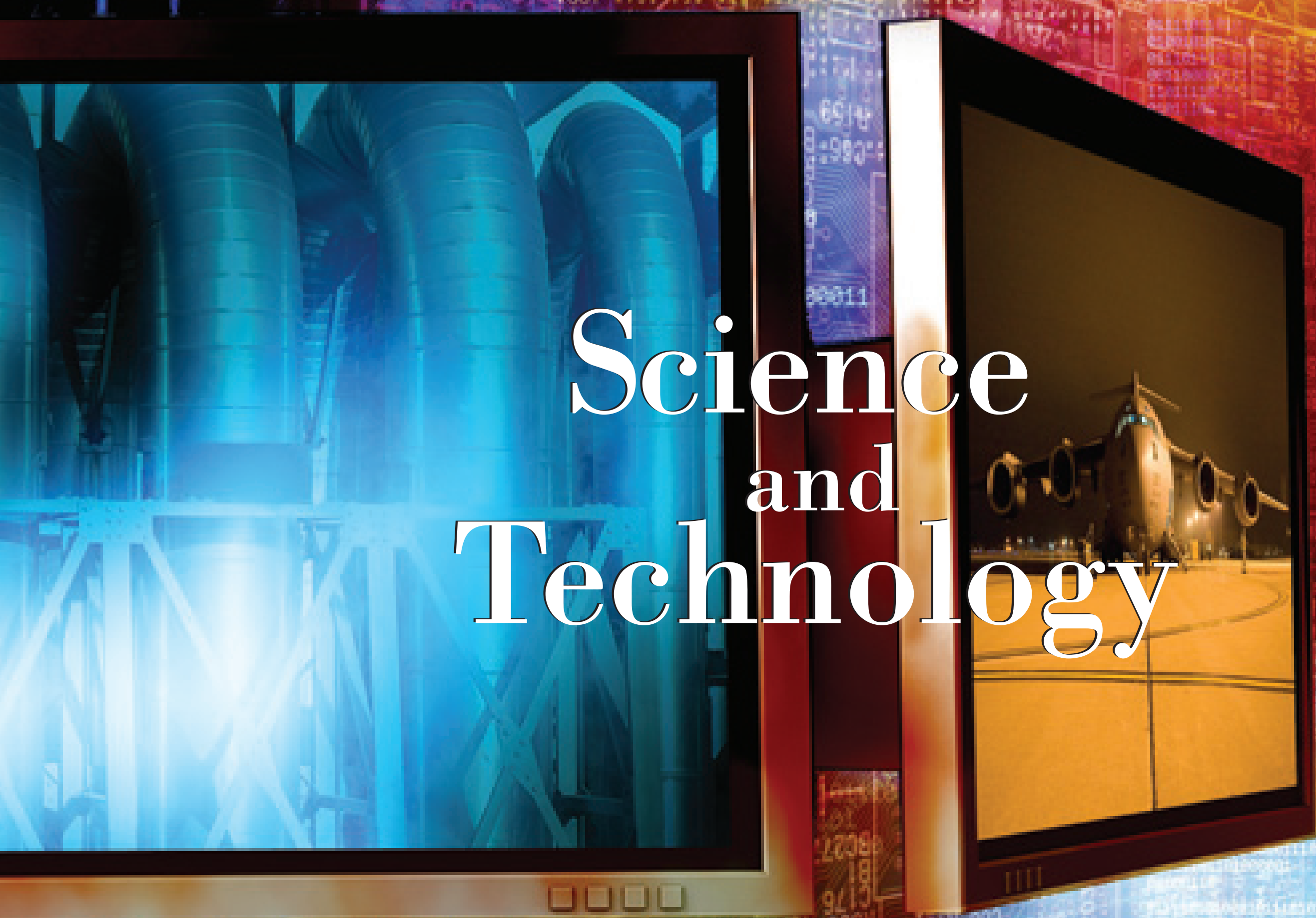
Defense Standardization Program

# Journal

January/March 2011



# Science and Technology

The Use of Geothermal Energy for Military Purposes

Data Standards Landscape 101

Standardizing the Rapid Delivery of Software to Warfighters

The High Cost of Technical Data

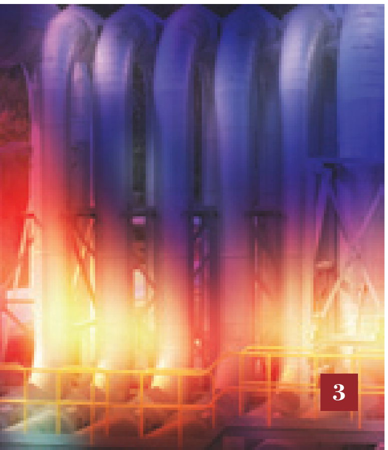
Defense Standardization Program Journal

# Contents *January/March 2011*

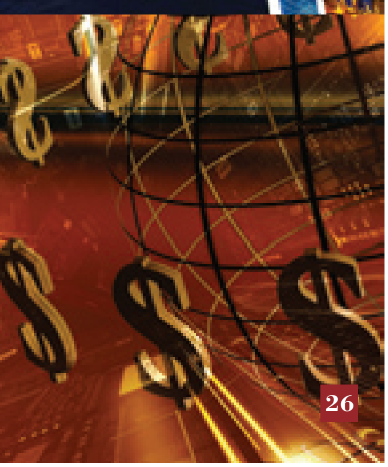


## *Departments*











The *Defense Standardization Program Journal* (ISSN 0897-0245) is published four times a year by the Defense Standardization Program Office (DSPO). Opinions represented here are those of the authors and may not represent official policy of the U.S. Department of Defense. Letters, articles, news items, photographs, and other submissions for the *DSP Journal* are welcomed and encouraged. Send all materials to Editor, *DSP Journal*, Defense Standardization Program Office, 8725 John J. Kingman Road, STOP 5100, Fort Belvoir, VA 22060-6220. DSPO is not responsible for unsolicited materials. Materials can be submitted digitally by the following means:

e-mail to DSP-Editor@dla.mil
CD or DVD to *DSP Journal* at the above address.

DSPO reserves the right to modify or reject any submission as deemed appropriate.



**Gregory E. Saunders**
*Director, Defense Standardization Program Office*

**Timothy P. Koczanski**
*Editor, Defense Standardization Program Journal*

**Defense Standardization Program Office**
8725 John J. Kingman Road, STOP 5100
Fort Belvoir, VA 22060-6220

**703-767-6870**
Fax 703-767-6876

**dsp.dla.mil**


For a subscription to the *DSP Journal*, go to **dsp.dla.mil/newsletters/subscribe.asp**

# Director's Forum

## The Next Big Thing...

**Blake Ross, the creator of Firefox, that now ubiquitous Internet browser, is reputed to have said that "the next big thing is whatever makes the last big thing usable."**

By that criterion, standardization—along with the documentation and implementation of scientific and engineering knowledge—is, and has been for years, the next big thing.

When Zachary Lemnios came on board as the Director, Defense Research and Engineering (recently changed to the Assistant Secretary of Defense for Research and Engineering), he announced four research and engineering imperatives. First on the list was "accelerate delivery of technical capabilities to win the current fight." Although standardization may not be the first thing that leaps to mind to satisfy this imperative, it definitely plays a vital role. It is through standardization of interfaces that equipment and personnel can interoperate. It is through standardization of units and measurement techniques that requirements can be documented and verified. It is through standardized presentation of requirements in specifications that competition—technical, cost, and risk—can be fairly accomplished. It is the capture of lessons learned in specifications and standards that keeps us from inventing the same wheel over and over and prevents us from repeating costly mistakes. The list could go on. But the lesson is that standardization is at least one very important means of turning the results of scientific research and technological development into usable information—usable for further research, for design into systems and equipment, for acquisition, and for support.

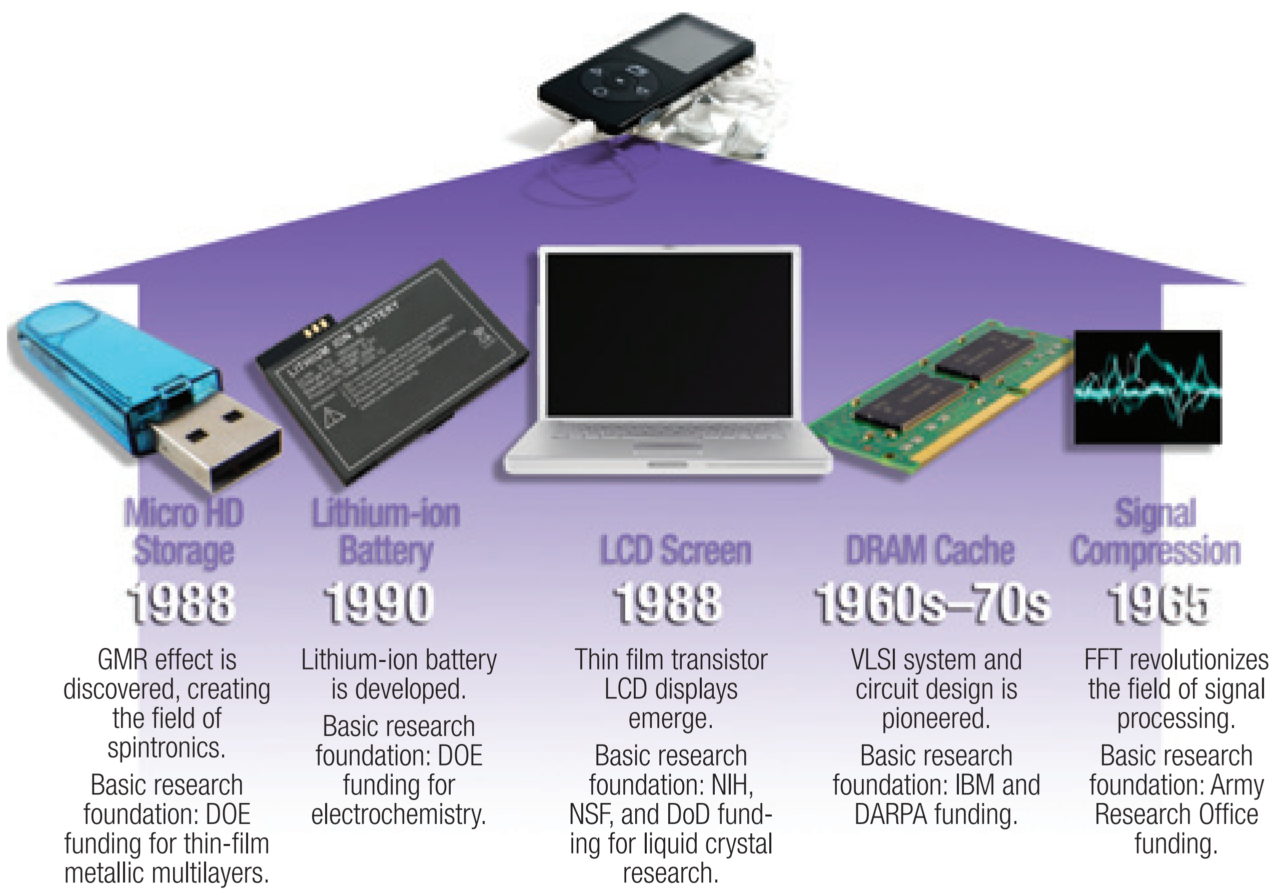
Mr. Ross's maxim can be illustrated by a wide variety of examples, but let me cite just one. In 1965, the idea that one might have a pocket-sized device capable of holding and playing back thousands of pieces of music would have been totally fanciful—the stuff of science fiction. However, scientific research on very-large-scale integration (VLSI) circuits and systems, begun in the 1960s and funded by the Defense Advanced Research Projects Agency (DARPA), provided the basis for circuits used

**Gregory E. Saunders**
Director
Defense Standardization Program Office

in Apple's iPod and other MP3 players. In 1965, research funded by the Army Research Office on fast Fourier transform (FFT) revolutionized signal processing, a necessary step for compressing signals to allow more information to be stored in smaller "batches." In the 1980s and 1990s, research funded by DoD, the National Institutes of Health (NIH), the National Institute of Standards and Technology, the Department of Energy (DOE), and the National Science Foundation (NSF) yielded thin film transistor LCD displays, lithium-ion batteries, and giant magnetoresistive (GMR) effects that led to the field of spintronics—all technologies necessary to let you put thousands of songs and videos in your pocket, retrieve them, and play them back. In this case, it was the bringing together of several things that made the "next big thing usable." The raw science didn't create an iPod, and I won't argue here that standardization created an iPod. But it is true that documenting our lessons learned and transforming knowledge into documented and usable form contributed to development of the iPod and its imitators and competitors. And standardization is, for sure, what allows you to buy earbuds from any of a dozen manufacturers for use with your MP3 player and allows you to "rip" songs from CDs for storage on your player.

It is this kind of movement of science and technology from the theoretical or experimental to the practical and usable that I believe both Blake Ross and Zachary Lemnios had in mind. Standardization and the tools made available through DSPO facilitate making the next big thing usable.

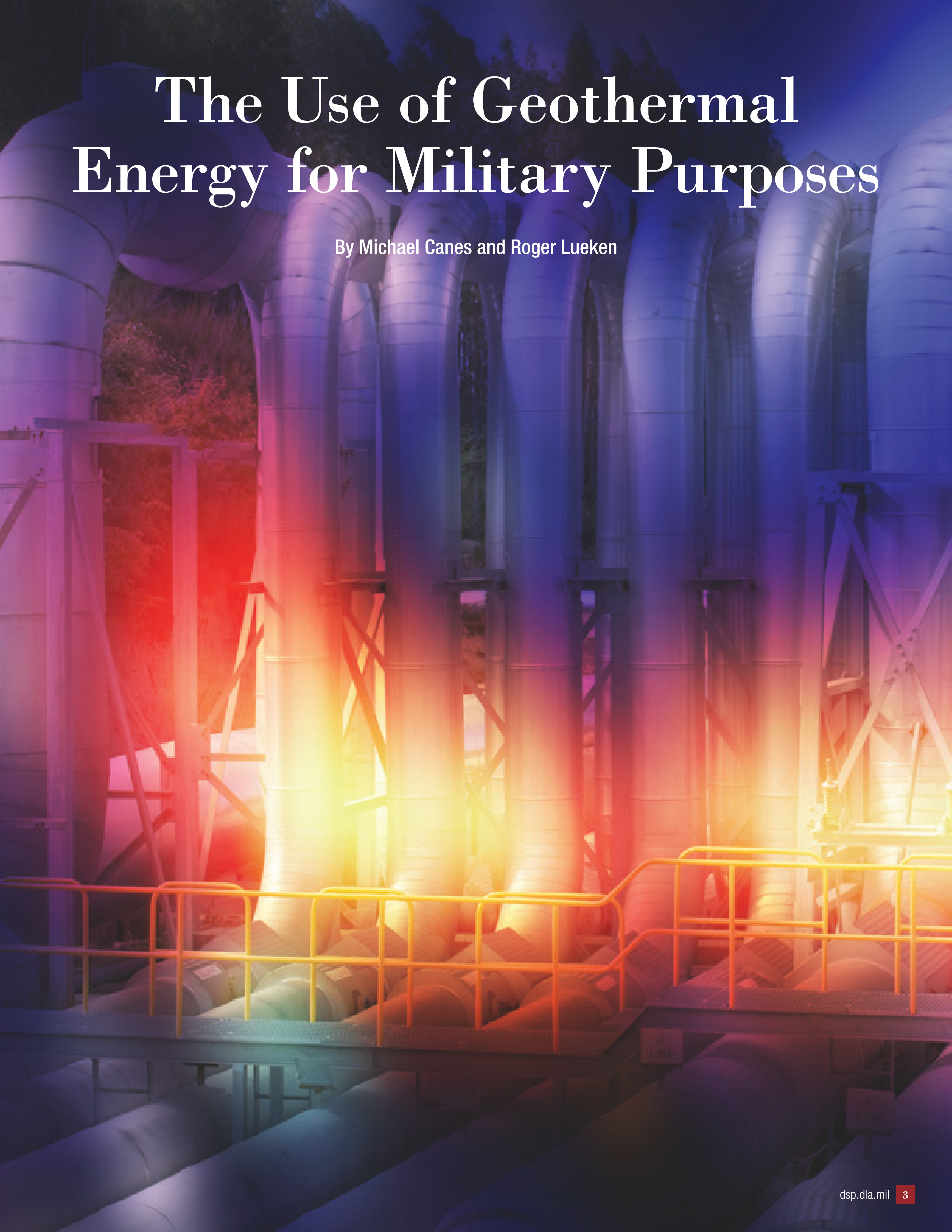
**Contributions of Science and Technology to the Development of the iPod**




Note: DRAM = dynamic random-access memory.

# The Use of Geothermal Energy for Military Purposes

By Michael Canes and Roger Lueken



The U.S. armed forces require energy for almost everything they do. Military installations consume large quantities of power, and operating forces consume fuel, power, and water, which have to be delivered wherever those forces are sent.

Analysts of military energy use have recognized that the costs and risks of energy supply to installations and to forces in the field are greater than they initially seem. Installations, which generally are supplied power from local electric grids, are vulnerable to longer term disruptions caused by natural events or by provocative acts. Forces in the field require considerable logistics assets to secure fuel supplies, including military assets to protect supply routes. Fuel supply also is subject to attrition through enemy action. When costs associated with use of the assets and attrition are figured in, the total cost of fuel is far higher than its initial purchase price.

The defense community has increasingly recognized the risks and costs associated with securing energy. In 2000, the Defense Science Board (DSB) Task Force on Improving Fuel Efficiency of Weapons Platforms developed the concept of the fully burdened cost of fuel (FBCF) to explicitly recognize the many cost factors associated with supplying fuel to a theater of operations. The concept is described in *More Capable Warfighting through Reduced Fuel Burden*, published by DSB in January 2001. The DSB Task Force on DoD Energy Strategy elaborated on the concept and, in a 2008 report, *More Fight, Less Fuel*, warned that DoD needed to recognize and reduce the risks inherent to installation overreliance on local electricity grids. The 2008 study also pointed out that environmental issues, particularly global climate change, pose rising challenges to DoD's energy future.

Geothermal energy offers one possible means to help resolve some of DoD's energy challenges. This form of energy has a number of advantages. It is relatively clean, with very low greenhouse gas emissions. The basic technology of extraction is well known, though as we shall see, a number of technological challenges remain. Although perhaps not inexhaustible, it can provide power at a particular location for a very long time. And unlike other renewable forms of energy, it provides a constant source throughout a 24-hour day. This enables power suppliers to utilize geothermal energy as a base load (constant) power source.

These features have encouraged DoD to invest in the technology in the past. However, to date, DoD and the private sector have mostly applied the technology where geothermal resources are known to exist. These sites consist of a source of high underground heat and a medium to convey the heat to the surface and turn it into steam. The challenge has been to enable exploitation of geothermal energy in more locations through the application of advanced technologies. Such technolo-

The Navy Geothermal Program is DoD's primary investor in geothermal energy. This program is administered at the Naval Air Weapons Station, China Lake, CA, by the Geothermal Program Office. This office manages the Coso Geothermal Field at China Lake and is exploring at several other installations, including Naval Air Station, Fallon, NV; Army Ammunition Depot, Hawthorne, NV; Naval Air Field, El Centro, CA; and Marine Corps Air Station, Yuma, AZ.

gies may enable the military and others to use geothermal energy even where the resources are more difficult to reach or to exploit.

The Defense Advanced Research Projects Agency (DARPA) convened a workshop in March 2010 to investigate the possibilities. Among other things, it focused on the potential use of geothermal energy on Guam, a Pacific island to which a large contingent of U.S. Marines is about to be transferred. Guam is of special interest because it is located in the vicinity of known sources of geothermal energy. In this article, we describe several of the technological challenges—and possible fixes—identified at the workshop and report some of the main findings.[1]

## Risks and Costs of Energy Supply at Fixed Installations

To compare geothermal power to other energy alternatives at fixed military installations, some context is necessary. The 2008 DSB study was concerned that U.S. military installations have few alternatives if power is interrupted for a lengthy period of time. The report stated that "almost complete dependence of military installations on a fragile and vulnerable commercial power grid and other critical national infrastructure places critical military and Homeland defense missions at an unacceptably high risk of extended disruption."

The report recommended that the military seek to "island" its facilities to the extent practicable by producing as much power as economically feasible on or near the installation from alternative sources such as renewable fuels. When viewed in this way, the relevant cost of alternatives to geothermal energy at these installations is that of producing power from sources such as wind, solar, or mini-nuclear power plants. The cost of these sources varies by location and by scale of operation, but often is several times that of electricity taken directly from the grid. By this reasoning, geothermal energy would be a cost-effective means of reducing installation dependence on local grids if it can be produced at costs below those of other local energy alternatives.

## The Fully Burdened Cost of Power

The fully burdened cost of power (FBCP) is analogous to the FBCF, but contains cost elements necessary to convert fuel to electric power. Generally, electric power is supplied to forces in the field by generators, which require support personnel and a vehicle to move them. The cost of providing power includes capital depreciation, operation and maintenance, transport, labor, a backup source, and fuel. Of these, fuel is by far the most costly when its fully burdened load is properly calculated. This fuel cost depends crucially on the state of conflict, with costs increasing as more defense assets are devoted to convoy protection and as more fuel, personnel, and transport equipment are lost to enemy action.

Table 1 shows the estimated costs associated with supplying power, through normal military channels to a theater of operations, for a 5 kilowatt (kW) and 60 kW generator under varying conditions: peacetime such as in contemporary Bosnia, low-intensity conflict such as what occurred for a few years in Iraq, and high-intensity conflict as currently experienced in Afghanistan. In peacetime, the FBCP supplied via a 60 kW generator in the field is $0.73/kWh, while that in high-intensity conflict conditions for a 5 kW generator reaches almost $4.00/kWh. This suggests that geothermal power could be a valuable alternative for forces in the field, if the military can harness it in a particular location.

**TABLE 1. Cost of Power for a 5 kW and 60 kW Military Generator under Varying Conflict Conditions (2010 $/kWh)**

| Condition | 5 kW | 60 kW |
|---|---|---|
| Peacetime | $2.33 | $0.73 |
| Low-intensity conflict | $3.55 | $1.44 |
| High-intensity conflict | $3.99 | $1.71 |

## Geothermal Technology

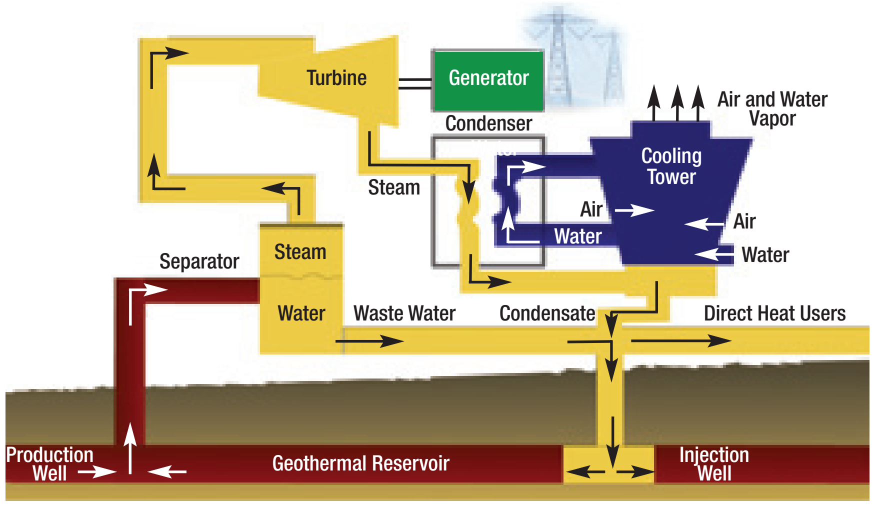
The process of generating electricity from geothermal energy is not new; commercial geothermal plants have operated for decades. Figure 1 shows a typical geothermal process. Basically, heat is drawn from under the earth to heat water to produce steam, which turns a turbine and generates electricity. The steam then is cooled and reinjected as water to be used again in the process.

## Accessing Geothermal Energy

### EXPLORATION AND CHARACTERIZATION

Before geothermal energy can be accessed, potential resources must be identified through exploration and then characterized. Geothermal exploration typically follows a three-step process. First, geologists use satellite imagery and aerial photography to identify areas likely to contain geothermal resources. Next, they perform on-site analyses of

FIGURE 1. Geothermal Energy Process




these areas to identify the best sites. Finally, they drill a small-diameter hole—called a temperature gradient hole—to penetrate the geothermal reservoir and provide temperature and pressure data that can be obtained only with at-depth measurement.

## DRILLING

The drilling of a geothermal well is similar to that of an oil or gas well. However, drilling geothermal wells can be more difficult and expensive because they typically go deeper and through less porous geologic formations. Geothermal drillers use oil and gas drilling rigs and generally drill at least two wells: an injection well and a production well. Drilling is typically the most expensive and time-consuming step in the geothermal process, accounting for 60 percent or more of the total capital investment and taking several weeks or months, depending on the depth of the heat reservoir.

## POWER PRODUCTION

Geothermal systems are similar to traditional thermal power plants in that they use heat to generate steam and turn a turbine. For geothermal systems, this heat is supplied by the underground reservoir. The most basic geothermal plants use steam supplied directly from the well. However, only the hottest geothermal resources can generate dry steam.

Advanced technologies such as flash systems and binary systems utilize geothermal resources that are not quite hot enough to supply dry steam. Flash systems convert hot geothermal fluids to steam by reducing their pressure in a flash tank. Binary systems use a working fluid with a low boiling point to generate steam. Because these technologies can generate power from lower temperature resources, they are more widely deployed than dry steam systems.

### ENHANCED GEOTHERMAL SYSTEMS

Most of the earth does not have the high-temperature geothermal resources, in situ water resources, and porous rock required for conventional geothermal power. Enhanced geothermal systems (EGSs) enable the use of marginal geothermal resources by creating an artificial geothermal reservoir with improved heat transfer.

Geologists create EGS reservoirs by stimulating existing geologic structures to increase the permeability and porosity of the rock system. Well stimulation is typically done by either injecting acidic chemicals or injecting large amounts of highly pressurized water. Researchers have successfully demonstrated EGS, but no commercial EGS plant has been built to date.

### GROUND SOURCE HEAT PUMPS

Ground source heat pumps (GSHPs) differ from geothermal power plants in that they do not generate electricity; instead, they use the earth's temperature to heat or cool a space. GSHPs are a mature technology used in residential and commercial buildings across the world. During the winter, GSHPs extract warm temperature air from the ground and inject cooler air from the conditioned space. In summer, the cycle is reversed, extracting cool air from the ground and injecting warmer air.

## Challenges to Military Use of Geothermal Energy

As noted above, the military already makes use of geothermal energy at one installation—Naval Air Weapons Station, China Lake, CA—and wants to expand that use to others. Figure 2 shows a geothermal plant at the Coso Geothermal Field at China Lake, which the Navy operates.

FIGURE 2. Coso Geothermal Plant at China Lake Naval Air Weapons Station, CA

Though the use of geothermal energy at China Lake shows the potential for military use of geothermal energy, a number of challenges must be overcome to encourage more widespread use. For one thing, geothermal exploration is resource intensive, requires time to implement, and has an uncertain outcome. Just as with drilling for oil or gas, drilling for a geothermal reservoir may require several weeks yet result in nothing but a dry hole. Also, in the field, personnel would require protection and considerable logistics support. Finally, geothermal energy is produced where it is found, but military forces go anywhere, whether or not natural resources abound.

The various challenges have several implications:

- Conventional geothermal energy technology probably is unsuitable for U.S. expeditionary forces except where they expect to remain in place for a long period (1 or more years).
- Such technology better applies to fixed installations. Even there, however, it requires a fortuitous combination of available resources at or near an installation. Better information on where geothermal resources are located would help identify the most promising instances.
- EGS is more likely to apply to military circumstances because potentially it could be used at a wide variety of locations. Advances in geothermal technology that are currently under development should help in this respect.
- GSHPs appear to apply both to expeditionary forces and fixed installations. The logistics needed to install and maintain them are minimal. However, GSHPs provide only heating and cooling, not power, so they could reduce the need for other sources of power, but would not eliminate it.

## Desirable Technological Advances

At the DARPA workshop, several areas for technological improvement were identified, and specific suggestions offered. The objective was to identify which technological breakthroughs would most advance the military use of geothermal energy. Three areas are of note: remote sensing technologies, next-generation drilling techniques, and EGS.

Geothermal resource identification in hostile territory requires advancements in remote sensing technologies. Alternatives include gravity gradiometry (measurement of the gravity gradients of an underground object in several directions), radar-based gas detection, infrared surface temperature measurement, and electromagnetic and thermomagnetic measurement. Resource identification also requires innovative new ways to achieve at-depth measurements. Options include automating the drilling process or developing ground-penetrating sensors with wireless communication capability that can be dropped from aircraft and would measure temperature, thermal conductivity, humidity, and soil gas composition.

Another challenge is to decrease the time needed for and the cost of drilling wells. At present, logistical requirements of geothermal wells probably preclude their application to expeditionary situations. Some options include automating the process to the greatest extent possible, using next-generation drilling techniques such as spallation (use of high-pressure water to fracture rock ahead of a conventional drill bit), installing casing while drilling, and drilling larger diameter holes in order to use coiled tubing, which is easier to deploy and automate.

EGS has the promise of enabling geothermal power at more locations with marginal resources. However, improved technology is needed to make widespread use of this technique, specifically, better methods to fracture rock, better underground mapping techniques, and more precise drilling via controlled directional drilling.

## Near-Term Opportunities

Geothermal power provides the military opportunities that can be exploited in the near term. These include the following:

- *Expanded use of GSHPs.* GSHPs have been used in the residential and commercial sectors for decades. The technology is mature and shown to reduce heating and cooling demand. GSHPs are simple to install and operate, allowing them to be deployed in theater or at domestic installations. Some experimentation may be desirable to see how best to exploit the approach, but it should prove cost-effective in many applications.
- *Geothermal deployment on Guam.* The U.S. military will be transferring more than 30,000 personnel and their dependents to Guam over the next several years, which will dramatically increase the island's population. The demand for energy on Guam will expand and likely stress the island's limited natural resources. Guam is situated in a region of volcanic activity, which often is associated with the availability of geothermal energy. The most pressing need is to investigate the heat gradient of the island's subsurface and the potential for geothermal energy by drilling a temperature gradient well. DoD investment in such an investigation would appear to have a potentially significant payoff.

- *More extensive deployment at fixed locations through improved resource mapping.* So far, geothermal energy has been used or is under investigation for only a handful of U.S. installations in a few western states. Yet resource conditions may be more favorable than previously understood. More extensive and detailed mapping of geothermal resources in the United States and elsewhere may well enable U.S. forces to make more use of this technology than has heretofore been the case.

## Longer-Term Opportunities

The long-term viability of geothermal energy for military use will depend on the advancement of some of the technologies outlined above. In particular, if EGS proves to be viable, geothermal energy could potentially provide power to both domestic installations and forward operating bases in a wide variety of circumstances and locations. This would improve energy security at those locations and provide a clean source of power for decades.

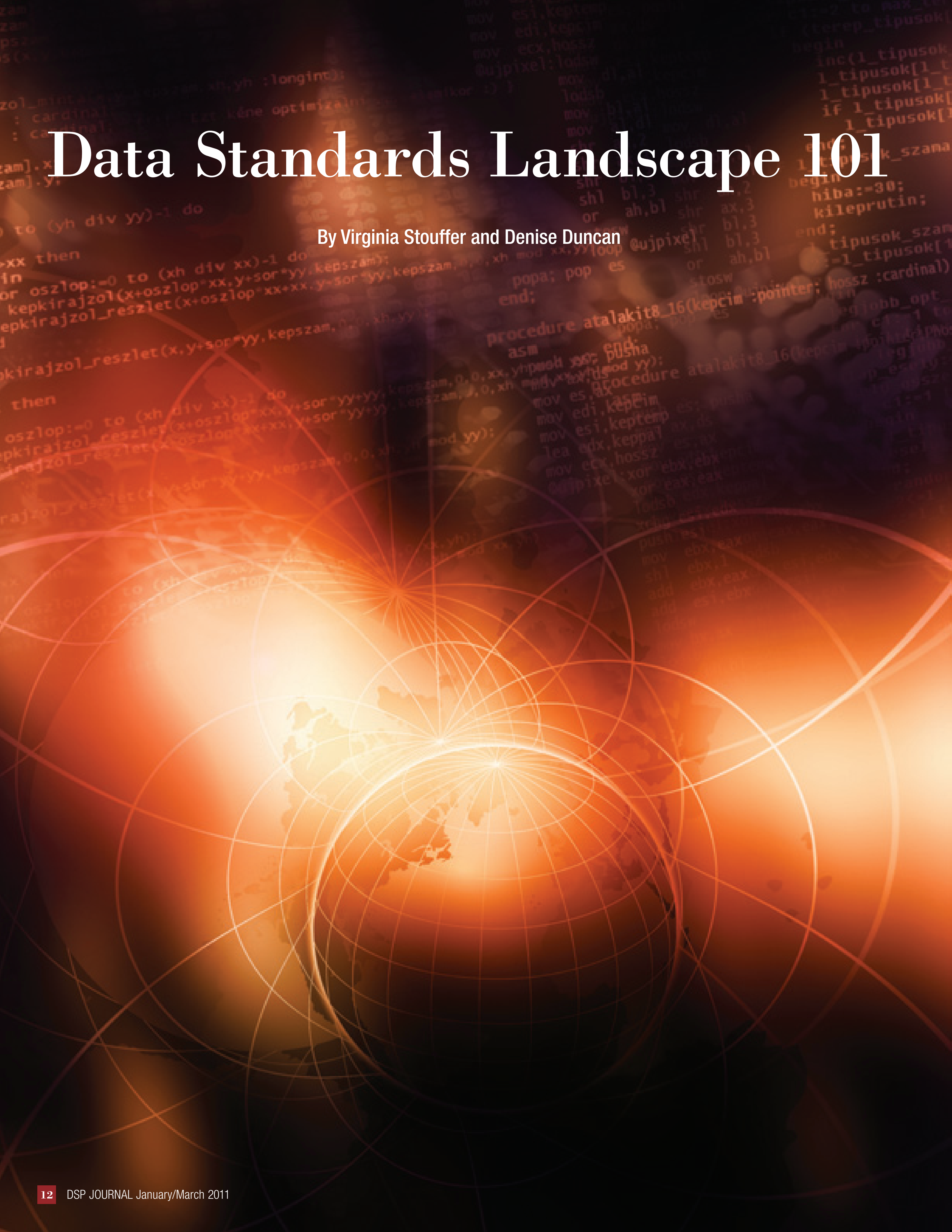
[1]For a complete report of the workshop, see *DARPA Workshop on Geothermal Energy for Military Operations*, LMI Report DRP90T1, Michael Canes, Roger Lueken, and Nathan Shepherd, May 2010.

### About the Authors

Michael Canes is a distinguished scholar at LMI, and Roger Lueken is an LMI research fellow. Dr. Canes works in the areas of alternative fuels, options for power supply, and cost-effectiveness analyses. Mr. Lueken analyzes energy efficiency and renewable energy technologies for federal agencies. Both Dr. Canes and Mr. Lueken assist agencies with strategies to manage greenhouse gas emissions.

# Data Standards Landscape 101

By Virginia Stouffer and Denise Duncan



Many standards have been developed to address the storage and exchange of technical data arising from the acquisition or support of a product. For someone trying to create a process for long-term data storage, or for data exchange across organizations, navigating the standards can be time-consuming. This article groups the most common and widely applicable standards by the type of guidance they provide and then briefly describes the standards. The article's intent is to guide readers to the right standards to meet their needs.

First, a description of the technical data to which these standards may apply is in order:

- *Technical product definition data.* These data fall into three categories:
  - Design information, including technical data packages, bills of material, drawings and computer-aided design (CAD) files, specifications, lists, interface control documents, software documentation, and engineering product structure
  - Information related to the design effort, such as trade-space analyses, engineering analyses, models, and test cases
  - Requirements information, such as statements of work, operational requirements documents, Joint Capabilities Integration and Development System documents, and integrated architecture model information and views (for example, operational views, systems views, and technical views).
- *Technical product operational information.* This information includes procedures and technical information needed by operators and support personnel to operate, maintain, and dispose of the product. Product operational information also includes field data that can be used to improve the product's design. Maintenance manuals; technical manuals; interactive electronic manuals; technical publications; support and test equipment information; packaging, handling, storage, and transportation information; environment, safety, and occupational health information; product prognostics and diagnostics information; and field quality deficiency reports are some examples of product operational information.

Standards also apply to other categories of product-related technical data, such as test reports, configuration control documents, supplier notices of obsolete parts, contract identification information, and many others.

### Types of Data to Be Preserved

Over the life cycle of a product, data may be needed for many reasons. For example, at some point, the product will need part support, rebuilding, reconfiguration, disposal, or similar other action. Using the original technical product information is always more accurate and less costly than rebuilding the information. Therefore, the technical data must be obtained from the original equipment manufacturer (OEM) as part of the product's acquisition. (Generally, OEMs will not supply needed technical data after the acquisition period is over.)

Two standards specify the minimum types of data that should be preserved by a program office:

- DoD 5010.12-M, "Procedures for the Acquisition and Management of Technical Data" (http://www.dtic.mil/whs/directives/corres/html/501012m.htm)
- Government Electronics and Information Technology Association (GEIA)-859, "Data Management" (http://www.geia.org/Standards-And-Publications).

### Data Storage

Storing information is problematic. The sheer volume of paper associated with storing printed copies of all pertinent documents discourages searching for particular information. Further, paper documentation is difficult to distribute to all potential bidders when seeking a second source for a replacement part, particularly if viable bidders are located far away. In contrast, electronic information enables the use of advanced concepts based on integrated digital environments, such as knowledge-based acquisition, model-based systems engineering, and integrated design-to-test requirements trade spaces. Clearly, electronic information is the preferred medium, but it carries its own long-term storage difficulties, including the likely expiration of a variety of possible operating systems and myriad application formats.

When at all possible, electronic data should be acquired in a structured format that is independent of the method of access or delivery and that is defined by or based on open standards. Data acquisition refers to all activities that create, obtain, or access data from internal or external sources to satisfy data requirements driven by the data strategy. Open data exchange formats promote interoperability of systems engineering tools and repositories, improve the meaning and understanding of data and its reuse, foster collaboration and competition, and help to ensure access to data consistently throughout the system life cycle and across systems of systems. Below are key open standards for the structure of digital data:

- ISO 10303, "Automation Systems and Integration—Product Data Representation and Exchange," which is known informally as the Standard for the Exchange of Product Model Data (STEP)
- Object Management Group, Systems Modeling Language (http://www.omgsysml.org/)
- Aerospace and Defence Industries of Europe (ASD)/Aerospace Industries Association of America (AIA) S1000D, "International Specification for Technical Publications Utilizing a Common Source Database (http://www.s1000d.org/).

Data stored electronically are searchable, but the useful life of electronic information formats is limited. New application releases appear every 18 to 24 months, and new operating systems (which underlie the applications) appear about every 3 years. Even if the storage medium is refreshed regularly, software readability becomes an issue after 5 to 10 years. Frequently, the information being stored is needed 15 to 20 years after acquisition. At that point, the original electronic documentation may not be readable without special investment. To know whether a particular electronic document is the one being sought, metadata tags and storage protocols are useful. For these reasons, original document format standards and metadata standards are crucial.

The Air Force's "Digital Data Description Requirement," used with DD Form 1423, "Contract Data Requirements List," shows contractors, in an instructional format, how to deliver electronic technical data files, both by specifying three acceptable formats and by outlining a series of easy steps to achieve successful electronic file submittal. The requirement references American Society of Mechanical Engineers, Electronic Industries Alliance (EIA), and military standards for file formats. It includes such details as dpi resolution for raster files, quality assurance verification standards for electronic transcription of information previously rendered in various physical media, reporting of page counts on replaced media or electronic files, and black/white foreground/background requirements. For 3D and CAD submissions, the requirement specifies 30 acceptable software programs, and the accompanying metadata form includes details such as classification, file type, software manufacturer, program and operating system, version number, associated weapon system, and part identification number. Experience shows that vendors do not interpret all the instructions correctly the first time through, so the Air Force's standard procedure is to have vendors submit technical data before their first milestone submission. The Air Force then performs a quality assurance check on the technical data for image usability, matching descriptions to images, matching 2D to 3D submissions, and checking for proprietary markings and classification levels. The Air Force asks its vendors for redundant technical data submissions in three formats: plotter (raster), native, and neutral (such as DFX for drawings or STEP or Initial Graphics Exchange Specification for 3D models).

The Air Force's "Digital Data Description Requirement," used with DD Form 1423, "Contract Data Requirements List," shows contractors, in an instructional format, how to deliver electronic technical data files, both by specifying three acceptable formats and by outlining a series of easy steps to achieve successful electronic file submittal.

### Data Exchange

Standards for exchanging technical data across boundaries are similar to a technical information protocol. Typically, such a standard will extend to the capture, storage, and reuse of data objects to provide the proper format for transmission.

The following standards deal with the format of data records or provide protocols for the exchange of data. Most have been used in the DoD domain, but some are also used commercially:

- Military Engineering and Data Asset Locator System, referred to as MEDALS, dictates a standard for proper indexing and management of product data.
- ISO 10303, "Automation Systems and Integration—Product Data Representation and Exchange," is a suite of standards used to exchange product model data. It provides application protocols specific to product types or life-cycle phases. This suite of standards is widely implemented by DoD OEMs who conduct business internationally.
- ISO 13584, "Industrial Automation Systems and Integration—Parts Library," provides standards for logical representation of parts, structuring of part families, exchange of views, interfaces for geometric programming, and so on.
- American National Standards Institute (ANSI)/GEIA-927, "Common Data Schema for Complex Systems," is a data schema for representing product and process data across domains.
- EIA-836, "Configuration Management Data Exchange and Interoperability," provides a way to create a central source of configuration management information and data formats for exchange among partners.
- ASD/AIA S1000D, "International Specification for Technical Publications Utilizing a Common Source Database," uses other international standards to support the production and use of electronic documentation.

### Data Management

Two commercially derived standards prescribe processes for managing data:

- ANSI/EIA-649, "National Consensus Standard for Configuration Management," describes configuration management functions and principles and defines a neutral terminology. This standard also has a companion handbook (GEIA-HB-649) to demonstrate the implementation of the configuration management functions.
- GEIA-859, "Data Management," describes technical data management functions. In addition, a handbook, GEIA-HB-859, is a guide for implementing these management functions.

## Data Releasability

Some technical data are subject to releasability restrictions. Therefore, preserving data requires preservation of the associated metadata that describes restrictions or other conditions on its release. DoD policy regarding the protection, marking, and release of data can be found in the following documents:

- DoD Directive 5230.24, "Distribution Statements on Technical Documents"
- DoD Directive 5230.25, "Withholding of Unclassified Technical Data from Public Disclosure"
- DoD 5400.7-R, "DoD Freedom of Information Act Program"
- DoD 5200.1-M, "Acquisition Systems Protection Program."

Data containing information subject to restrictions must be protected in accordance with the appropriate guidance, contract, or agreement. Guidance on distribution statements, restrictive markings, and restrictions on use, release, or disclosure of data can be found in Defense Federal Acquisition Regulation Supplement Part 252.227-7013 and 7014 and in DoD Directive 5230.24.

Section 208 of Public Law 107-347, as well as DoD guidance, requires a privacy impact assessment before developing or purchasing any government information system that will collect, maintain, use, or disseminate personally identifiable information about members of the public, federal personnel, DoD contractors, and, in some cases, foreign nationals.

## Conclusion

This article has identified some of the most common and most widely applicable standards for the management of technical data. Many other standards exist as well. The authors invite other data management practitioners to comment on and add to the body of knowledge presented here on the classification of technical data. Reusing technical data saves time and money for the owning organization, for the primary users, and for the secondary users (or secondary market) for the data.

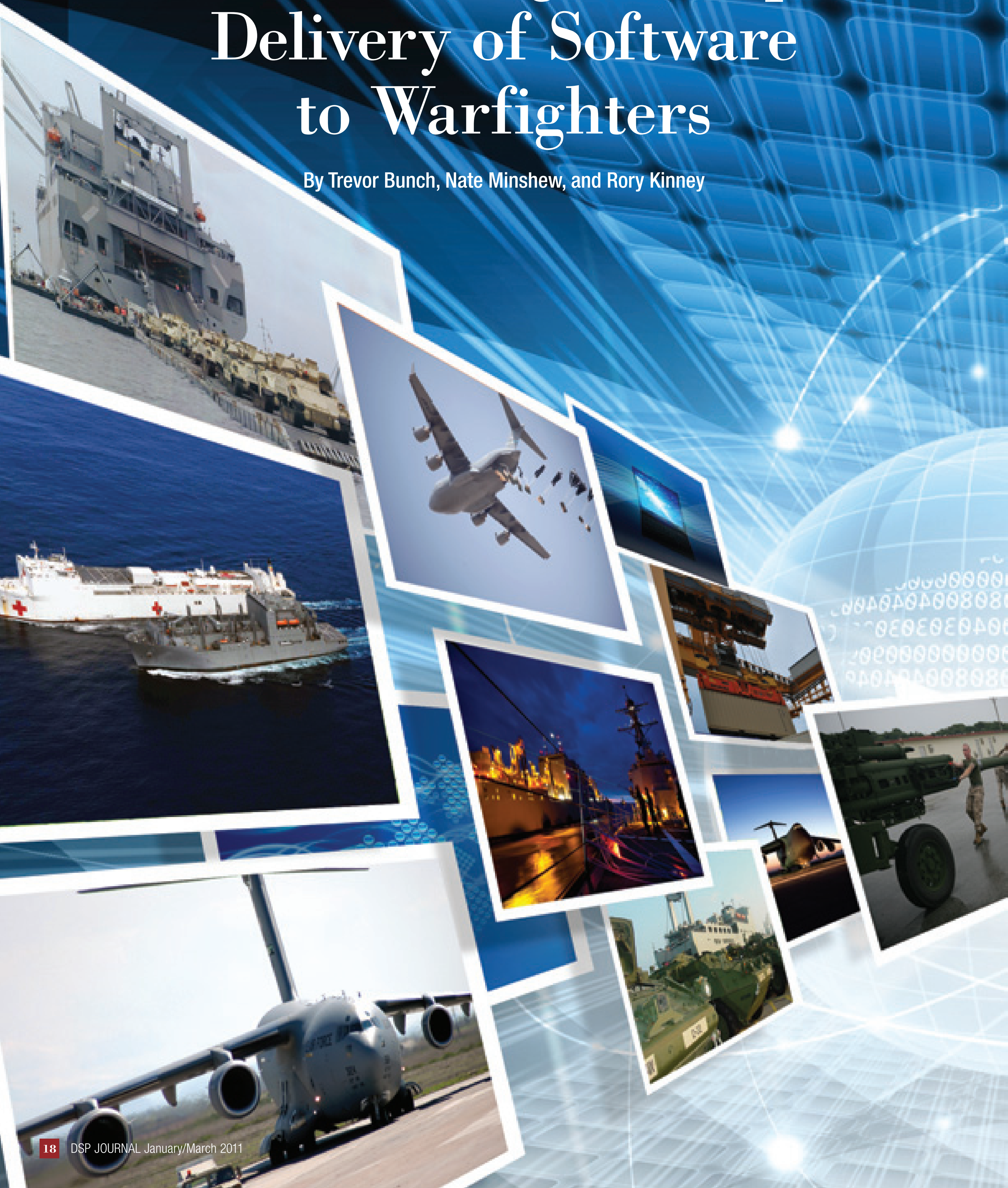
### About the Authors

Virginia Stouffer, a senior fellow at LMI, has supported a variety of DoD and civil clients in data management quantification, and she writes and speaks on data management best practices.

Denise Duncan is also a senior fellow at LMI with 30 years of experience in information systems, including developing enterprise information architectures. She leads the development of standards, handbooks, and training in enterprise-level data management and information management.

# Standardizing the Rapid Delivery of Software to Warfighters

By Trevor Bunch, Nate Minshew, and Rory Kinney



Navigating the gauntlet of complex funding, contract, and program schedules to satisfy a customer's urgent requirement for software can frustrate even the most battle-hardened program manager. But this is what enterprises ask their programs of record (PoRs) to do—perform virtual miracles. Although this approach rewards extensive planning by customers and program managers alike, it rarely satisfies customer expectations and needs due to its slow, linear delivery method. This article describes barriers to delivering software rapidly and then outlines some of the innovative solutions developed by the U.S. Transportation Command (USTRANSCOM) to streamline that delivery. Those solutions focused on standardizing enterprise governance, adopting agile development practices, and establishing a common computing environment (CCE). The authors also offer lessons learned from USTRANSCOM's experience.

## Challenges to Rapid Software Delivery

Delivering software to warfighters is fraught with complexities. Changes within operations generate new requirements faster than they can be fulfilled, while technological advances continually present new opportunities. Likewise software performance requirements leave little room for error. In the midst of this complexity, three barriers to deploying software rapidly are clearly evident:

- *Program-centric requirements.* The most urgent requirements are directly generated by users in the field operating specific systems on a day-to-day basis. These requirements are inserted directly into the owning PoR's to-do list. Although the PoR wants to respond quickly, it must not disturb planned deliveries that have been programmed perhaps years earlier and blessed by an investment review board. The PoR must then navigate through system support contracts, which opens questions of contract scope, task orders, and access rights to the source code to make the necessary modifications. After successfully navigating these waters, the now aged, granular program requirement is satisfied, while enterprise mission priorities have shifted, creating risk in both need and solution.
- *Funding models.* A PoR's funding and milestones are established in annual funding increments for 6 years, called the Future Years Defense Program (FYDP). The FYDP for established PoRs comprises mostly sustainment activities, such as maintenance of software licenses and hardware refreshes. The sustainment dollars have restrictions against their use for major system upgrades, limiting a PoR's ability to reprioritize spending to meet warfighters' requirements. Responding to new requirements means finding funding sources. As an example, consider information-sharing requirements that span multiple PoRs. Projects that foster information sharing are critical to achieving DoD's net-centric goals, but identifying who can and will pay for enhancements to the affected systems becomes an additional hurdle to funding the project.

- *Development processes.* Assuming the requirement is properly prioritized and funded, the development process provides additional challenges. Each PoR then establishes and maintains its own development, testing, integration, and production environments. These environments may be spread across multiple contractor and government sites. Any upgrades and staffing requirements must be coordinated and executed before solutions are developed. The path to production can cause inconsistencies in development, testing, and promotion to production. These inconsistencies then cause lengthy certification and accreditation (C&A) lead-times, further delaying software delivery.

The bottom line? Program-centric requirements, funding models, and development processes all contribute to an increase in the time and cost of software development and prevent organizations from responding rapidly to new customer-driven requirements.

## Enterprise Governance

Transforming an organization's software delivery model requires three key ingredients: (1) a defined enterprise, (2) governance processes and structure, and (3) funding control or influence. A defined enterprise specifies the mission capabilities and business processes to be optimized. It also provides the basis for defining requirements and for prescribing a target architecture to achieve those capabilities and processes. The governance processes and structure reinforce the to-be enterprise and direct the funding to achieve it.

When handled at the program level, requirements management can pose significant challenges to the enterprise. Requirements tend to focus narrowly on program-centric capabilities, and without mechanisms to view requirements across the enterprise, the ability to recognize common capability gaps, build enterprise solutions, and minimize duplicative investments can be extremely limited.

USTRANSCOM's solution is to funnel all new requirements into a standardized process that evaluates them through a common lens, the command's Joint Deployment and Distribution Architecture–Enhanced (JDDA-E). In addition, the creation of a corporately run governance structure, headed by the customer, prioritizes projects in the context of mission needs. This vetting ensures greater visibility and the potential to receive prioritized enterprise funds. This helps to eliminate the program's struggle to find funding to satisfy warfighter requests.

To successfully manage enterprise requirements, the enterprise must evaluate the entire life cycle of each investment. USTRANSCOM defined this evaluation as its corporate governance process. In this process, all enterprise-level requirements, gathered from strategic plans and user communities, are evaluated against a target architecture, the JDDA-E. By using the architecture to guide DOTMLPF assessments—analyses of alternative doctrines, organizations, training, materiel, leadership and education, personnel, and facilities—the command can select from solutions and funding scenarios in a mission, performance, and information context. In post-implementation reviews, the corporate board may then evaluate the extent to which requirements were satisfied and the perceived performance enhancements.

Central to this governance process are defined enterprise capabilities and a road map to achieve them. For USTRANSCOM, the Corporate Services Vision (CSV) outlines the strategy to transition from system-centric silos of capabilities to a service-oriented approach built on standard web services, standard business processes, and a common platform. The JDDA-E defines a future environment and guides the development of enterprise capabilities as prioritized by the corporate governance process. This enables capability-based portfolio management and focuses investments on optimizing performance.

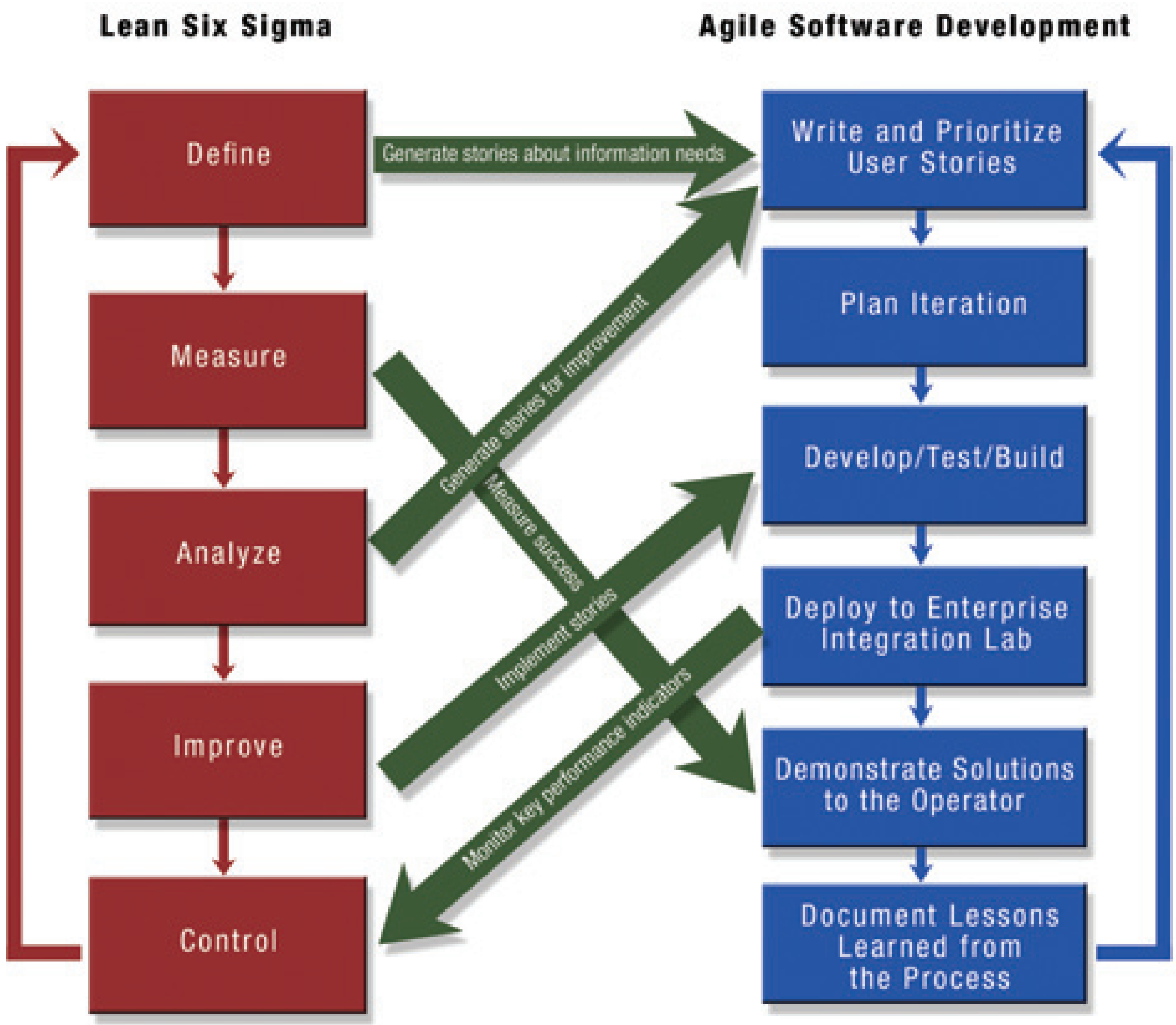
This approach also solves programmatic barriers, but USTRANSCOM made two other enterprise-level investments to optimize the speed, cost, and consistency of delivering enterprise software: the Enterprise Integration Lab (EIL) and CCE.

## Agile Development in an Enterprise Integration Lab

The EIL is an enterprise virtualized development environment that facilitates the standardized delivery portion of the CSV through standardizing business process, web service, information exchange, and portlet development. Business process management drives the majority of software development within USTRANSCOM. The business processes are modeled and web services are used to access data and interact with user interfaces presented within a customizable work-centric portal called iDistribute.mil. To support these development efforts and to follow best practices, analysts and programmers are provided a suite of preconfigured standard tools. The tools allow them to maintain source code, manage their projects, and write automated testing scripts against their code and user interfaces. In addition, the tools mimic the production environment and are preconfigured to meet security standards defined in the production C&A package, streamlining the path to production.

In addition to the tooling, the EIL has adopted an innovative blend of Lean Six Sigma (L6S) continuous process improvement practices along with agile development methods. (See Figure 1.) Composite Agile Development Teams (CADTs) are composed of a diverse group of people, including a functional sponsor, a technical architect, an information specialist, an L6S black belt, an information assurance expert, developers, and an agile coach. The CADT uses the L6S "define" step to create user "stories." The team prioritizes these stories into iterations, 2-week projects with demonstrable deliverables. The

FIGURE 1. Integrating Continuous Process Improvement and Agile Software Development




Source: USTRANSCOM, *JDDA-E Concept of Operations for Composite Agile Development Teams (G17)*, Version 1.0, February 2010.

team pairs technical expertise with "lean" methods to build solutions within that time frame. Solutions go through a rigorous test, integration, preproduction, and production test process to ensure the application of EIL software development best practices such as code versioning, configuration compliance, and reuse of enterprise services. Improvements are measured and documented. At the end of each iteration, and before beginning the next iteration, the team documents measured improvements and lessons learned. This approach allows for course corrections while the costs of changes are relatively low.

To communicate development activities across CADTs, weekly meetings are held to discuss any emerging capabilities being worked, as well as improvements to the agile methods used within the command.

## Common Computing Environment

In the past, each PoR secured its own hardware and regularly refreshed that hardware. Because each PoR had to plan for redundancy and continuity of operations (COOP) at peak usage, hardware capacity far exceeded utilization—which ranged from 15 to 25 percent—with the vast majority of hardware capacity unsharable. To address this issue, USTRANSCOM established the CCE, a certified and accredited environment supporting the standard development, integration, testing, and hosting of Joint Deployment and Distribution Enterprise (JDDE) information technology (IT) assets and capabilities. By virtualizing the environment and pooling COOP resources, USTRANSCOM expects to reduce the server population by two-thirds and run servers at 60 to 80 percent utilization. This recapitalization alone will help fund the next round of enhanced capabilities and legacy system transformation. As this capability matures into "Infrastructure as a Service," the JDDE will continue to reduce the number of facilities and support personnel, while improving computing utilization and facilitating on-demand provisioning for increased scalability.

When fully implemented, common platform services will improve security, access control, and disaster recovery. Each PoR will use a standard technology stack of security-hardened virtual machines. From the application configuration down to the virtualized instance of the operating system, standard secure versions will be maintained globally within the CCE. Common network authentication, identity stores, and policy enforcement points will govern access control. Centralized logging of all enterprise events and select system events will be captured and analyzed to profile and detect potential cyber-attacks and network performance degradation. The multisite CCE strategy addresses disaster recovery in terms of hot provisioning. Data within the CCE are replicated to alternative sites synchronously for mission-critical applications, seamlessly transitioning a user session to an alternative instance without the user noticing. During high-volume periods, this replication is prioritized according to mission criticality and system interdependencies modeled within the JDDA-E.

By consolidating development and production within a single C&A environment with hardened cybersecurity measures, USTRANSCOM will be able to respond to warfighters' software requirements in an agile fashion.

## Lessons Learned

In January 2010, USTRANSCOM began transitioning its future architecture (JDDA-E) into an operational reality. Using the command's most diverse, information-intensive PoR, Agile Transportation for the 21st Century (AT21) program, CADTs began continuous process improvement and business process management projects within the EIL. In less than 8 months, USTRANSCOM designed, built, and received full authorization to operate the CCE and developed AT21 functionality for use in the command's Fusion Center. CADTs were trained in agile and lean methods. Through iterative 1-week delivery cycles, the teams delivered portal-based applications on unclassified and classified networks. As the model is scaling enterprise-wide, three lessons learned are key.

### LESSON 1—A DEFINED ENTERPRISE, GOVERNANCE, AND FUNDING ARE CRITICAL

As the DoD Distribution Process Owner, the USTRANSCOM commander has a defined enterprise and control of the Transportation Working Capital Fund–Information Technology (TWCF-IT). TWCF-IT, the primary funding mechanism of the core distribution systems, is tightly controlled. As enterprise requirements increased and the majority of funds remained buried in growing program sustainment, there was little room in the portfolio for new capabilities. USTRANSCOM leaders addressed this issue by constructing a command-wide vision centered on business process optimization and CSV. The remaining ingredient, governance, was codified and grounded in the prescriptive JDDA-E. Now, all new requirements and sustainment requests can be viewed through a common lens of business priority and CSV fit.

### LESSON 2—TRANSITION STRATEGIES MUST BE FLEXIBLE

Legacy systems do not miraculously transition when a new architectural vision is moving forward. It takes considerable time and effort to "corral" all of the technology, policy, and acquisition issues. From a technology perspective, the target environment may not be suitable for the legacy system, and it may not be economical to redesign the legacy system for the target environment. To address these issues, USTRANSCOM defined CSV migration compliance phases and made infrastructure adjustments within the CCE to accommodate legacy hosting.

From a legal perspective, securing rights to the source code and requiring its submission to a government-controlled enterprise repository must be coordinated with the acquisition office and the general counsel to ensure their inclusion in the contract language. Obtaining rights retroactively can be difficult and expensive.

### LESSON 3—RESPONSIVENESS MUST BE MODERATED BY CHANGE MANAGEMENT

Customers love responsiveness, but providers must manage release cycles according to the users' ability to process change. For USTRANSCOM, the CADTs delivered incremental solutions every week, and the functional representatives on the team were eager to share each release and all of the additional capabilities built into iDistribute.mil, a work-centric portal. However, this was not always appropriate, because some of the functionality was targeted for the Fusion Center floor where experimentation is not practical due to operational demands. USTRANSCOM is deliberately adding communications and training to its change management processes. The transition from "maybe next year" to "here's a team of eight to solve it this month" is in place and well on its way to rapidly delivering capabilities as needed by the customer.

## Summary

Consolidation and standardization within a CCE provides the necessary capital and foundation to respond rapidly to warfighters' requests for improved software. An EIL provides the structured process and standard tooling to produce high-quality products within a C&A environment, reducing delays in promoting solutions to production. Corporate-wide governance based on a prescriptive enterprise architecture ensures the delivery of capabilities according to the portfolio manager's investment strategy. With this foundation, PoRs can return to their original mission, serving the warfighter by focusing on capabilities delivery and not infrastructure applications.


### About the Authors

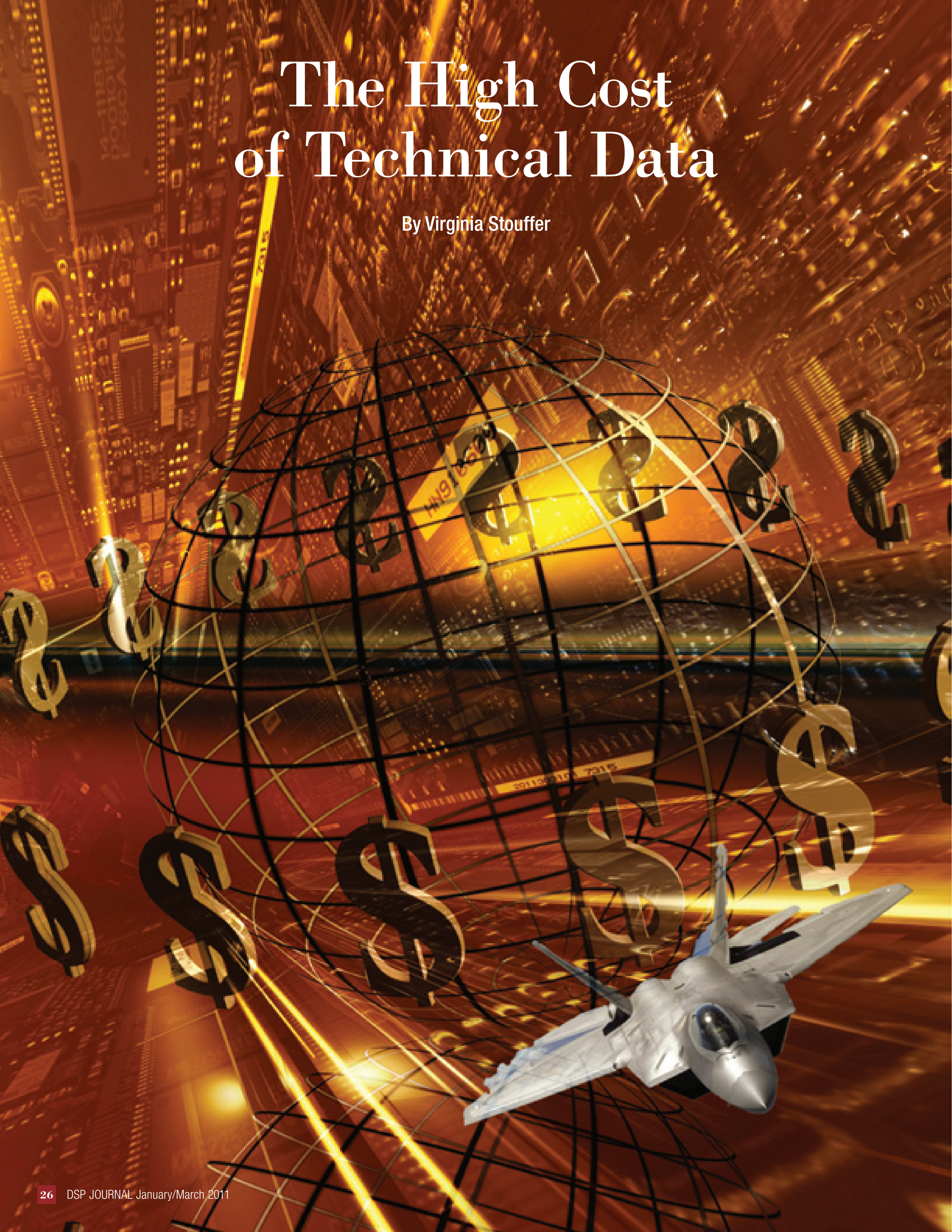
Trevor Bunch is a certified enterprise architect with LMI. He has more than 10 years of experience managing IT projects and facilitating enterprise architecture development and adoption within the federal government.

Nate Minshew is an enterprise architect and agile methodologist with Asychrony Solutions, Inc. He has more than 5 years' experience working in agile development environments, leading teams and using test-driven development.

Rory Kinney is the chief of the Distribution Enterprise Architecture Division assigned to the Command, Control, Communications and Computer Systems Directorate, USTRANSCOM, Scott Air Force Base, IL. He is a retired Air Force Colonel specializing in communications and information systems.

# The High Cost of Technical Data

By Virginia Stouffer



What can't be had for any price? We can all think of things that are priceless, but to a product manager, the answer might be technical data—not just any data, but the technical specifications needed to reacquire, support, or replace a vital piece of a government agency's mission-critical infrastructure or operating equipment.

Technical data are essential for the maintenance and support of military systems, as well as for the development of add-ons or next-generation versions of those systems. Unfortunately, program offices often fail to collect technical data during the system acquisition process. Failure to do so can lead to much higher system lifetime costs, because obtaining technical data after the acquisition process has been completed can be obscenely expensive. This article discusses the pitfalls of collecting technical data, the potential costs to obtain those data, and some ways to ensure the availability of good-quality technical data when needed later in a system's life cycle.

The term "data" connotes a rather dry topic, but consider this example. Suppose a circuit card that is used in several critical systems begins failing at the 10-year mark. The circuit card is no longer manufactured, and the agency that bought the card does not have the technical specifications, or data, to build a replacement card. Spare cards are being depleted rapidly, and there is no longer a supply of spares at every location where the circuit card is used. Every time a circuit card fails, there is a 2-hour delay to get one of the precious dwindling stock to the operating location. Now suppose that the circuit card is part of a tsunami warning system. Or perhaps it is part of an air traffic control system and its outage imposes 2-hour delays on 5,000 frustrated passengers each time it fails. Or maybe it is part of a system that queues the unloading of thousands of container ships at a major U.S. port. The product manager asks to buy the technical data from the manufacturer, but the manufacturer won't sell its proprietary data. It will sell you a replacement system, however. The earliest the replacement system can be funded and installed is 3 years. In the meantime, as the supply of spares is depleted, critical systems are at risk of being put out of service or failing in some catastrophic way.

The unavailability of technical data when needed can occur for dozens of reasons, even if the program office intended to buy the data as part of the acquisition. For example, a data deliverable may have been in the request for proposals but was not in the statement of work, and no one in government noticed until after contract award. The government agency must specify the technical data as a deliverable in the acquisition contract. However, if no milestone payment is associated with that deliverable, the vendor may fail to deliver the data, and the government has no redress. Obtaining the data becomes a war of attrition between the government contracting officer and the vendor's attorneys, a war the vendor always wins as the government personnel move on to new projects, and sometimes new jobs and new acquisitions. Replacement government personnel have too much to do, and pursuing technical data without a payable milestone, from a corporate attorney who does not even answer the phone, quickly drops off the top of the priority list.

If the acquisition contract has a milestone payment for technical data, it must also specify a condition for completeness. Otherwise, the technical data package (TDP) may be 99 percent complete except, say, for the data about one circuit card. It is practically a rule of engineering that the least-reliable element of the system, the one that was being reworked right up to expiration of the acquisition contract, is the one element whose technical data will be missing in the end. And the least-reliable element will be the biggest headache for the product support manager. As program management personnel leave for their next jobs, they leave a list of to-dos for the last one out to try to accomplish before the program expires.

Technical data and the milestone payment are in the trade space between the program manager and the vendor as the program manager discovers the unstated requirements of a new capability. In other words, technical data and the milestone payment get traded for additional functionality in the face of a limited program budget, expanding costs, and unstated requirements. Or, the government manager trades for limited data rights; for instance, the government agrees not to share the technical data with any potential vendor without the written permission of the original equipment manufacturer. The technical data are accessible but proprietary. Even limited data rights can be quickly rewritten when the vendor issues a post-acquisition upgrade, but does not deliver the technical data on the upgrade to the government.

What happens after the acquisition is complete and technical data are needed but missing? Some data can be obtained from the vendor. Not every part's technical specifications will be zealously guarded by a phalanx of industry attorneys. However, for every free-and-open transaction, there is also a data horror story, as the following examples show:

- The cost of a hardware-only, limited-rights TDP was 0.5 percent of the total acquisition cost of an electronic system.
- The cost of a copy of the contractor-derived specifications database was 3 percent of a multiplatform, multibillion-dollar procurement.
- The cost of a copy of the proprietary, detailed software test analysis for an electronics system was 10 percent of the total initial contract cost.
- The cost of an unlimited government-rights TDP for a $22 billion system was 100 percent of the cost of the entire acquisition.

Most of those cases started with the government asking for full unlimited data rights, but eventually buying only a subset of the data. Not only are the TDPs themselves costly—and may not be obtainable at all—but obtaining them requires tremendous amounts of a contracting officer's time because the contract must be extended again and again for delivery of the TDP.

Another concern is legal ownership of the data. Often, the government may include technical data as part of the acquisition and receives the first TDP with unlimited rights. Then, as changes or improvements are made, later versions of the TDP are marked "proprietary." Getting a copy of the technical documentation that is not marked proprietary requires the attention of a program office function lead and an established milestone associated with data delivery. For the government, having propriety information on how to make a part is useless, because it cannot use that information to competitively outsource the manufacture of a replacement part. The exception is if the government can make the part itself by using its own industrial facilities such as forges or computer-aided design (CAD)-assisted manufacturing facilities. Without government ownership of the intellectual property rights of the technical data, the government cannot even award a contract to replace a part that the original equipment manufacturer no longer makes. The problem applies to uniquely forged benches and cheap rubber hoses alike.

Avoiding the problems—exorbitant costs, ownership issues, and so on—associated with technical data requires taking both short-term and longer-term steps. The crucial steps are as follows:

- Short-term steps
  - Require delivery of technical data in the acquisition contract and associate the data delivery with a milestone payment. There should also be a second, separate milestone payment for the complete TDP. In addition, technical data should be delivered in multiple electronic formats, including native vendor 3D CAD file and traditional government vendor-neutral flat file.
  - Include a data manager as a functional lead in the acquisition integrated product team. It is the job of the data manager to watch over the technical data rights, and the delivery of the technical data, to ensure data rights are not traded away for functionality and to certify the technical data acquisition milestones. The data manager must also ensure that the proper data formats are delivered and that the data delivered are appropriate, without proprietary markings.
  - Require an early submission—before the delivery of data associated with a milestone payment—of the TDP. Perform a quality assurance check on the data that considers usability, match of descriptions to images, lack of proprietary markings, and appropriate classification markings, among other things. The Air Force's Digital Data Description Requirement and accompanying DD Form 1423, "Contract Data Requirements List," shows contractors, in an instructional format, how to de-

liver electronic technical data files, both by specifying three acceptable formats and by outlining a series of easy steps to achieve successful electronic file submittal.

- Longer-term steps
  - Assert ownership rights to the technical data on any assets acquired. In other words, if a contractor builds a system to the requirements specified by the government, the government should have unlimited rights to the associated technical data needed to maintain and replace the item. (Implementing this step may require statutory action.)
  - Establish an acquisition career field specialty for data managers, with training in data management and certification of data managers.
  - Plan for the long-term storage of technical data.

The three steps to be taken in the short term will ensure that technical data are not forgotten or lost in trades during an acquisition, that the data are of good quality, and that the government has unlimited use of the data. The longer-term steps provide for the readability and usability of technical data by government maintainers well into the future and establish a career field necessary for further development of data management. Starting down this road now will help eliminate, or at least mitigate, obsolescence issues that can be prevented during the acquisition process.

### About the Author

Virginia Stouffer, a senior fellow at LMI, analyzes technical feasibility. Ms. Stouffer has supported a variety of DoD and civil customers in data management quantification, and she currently writes and speaks on data management best practices.

# Program News

*Topical Information on Standardization Programs*

## DMSMS Working Group Recognizes DMSMS Management Achievements

Diminishing Manufacturing Sources and Material Shortages (DMSMS) management (also known as obsolescence management) is critical to the sustainment of modern military and commercial systems and overall life-cycle management that enables the readiness support of warfighters. Effective DMSMS management requires a synergistic effort by many individuals and teams across several disciplines and communities, including acquisition, parts management, standardization, logistics, and sustainment. Over the years, individuals and teams have developed numerous tools, publications, processes, policies, and procedures to mitigate DMSMS and promote proactive DMSMS management. The DoD DMSMS Working Group publicly recognizes their outstanding contributions and achievements through annual awards.

The 2010 awards, presented at the 2010 DMSMS and Standardization Conference, included a lifetime achievement award, three individual achievement awards, and four team achievement awards. The criteria for the 2010 awards were fivefold: exceptional DMSMS management of a weapon system, significant improvement in quantifiable readiness levels, substantial cost avoidance, exceptional warfighter support related to or realized through a DMSMS issue, and creation or implementation of a DMSMS "best practice" demonstrating high positive impact on the warfighter.

The 2010 awards were presented by Mr. Stephen P. Welby, Director, Systems Engineering, in the Office of the Director, Defense Research and Engineering, in the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, and by Mr. Gregory E. Saunders, Director, Defense Standardization Program Office.

**Congratulations to this year's winners!**

# Lifetime Achievement Award

**Charles "Chuck" Marshall** received the Lifetime Achievement Award for his leadership with the U.S. Army, Defense Logistics Agency, and ARINC Engineering Services, LLC, that enabled him to "do what needed to be done" throughout his career. He is the proverbial "man behind the scenes" making things happen. The first thing you will hear him say is, "There is no such thing as the all-knowing expert." When he isn't preaching reference number category codes and variation codes, he will tell you "a tool alone is not enough, it takes a team and a tool set," followed closely by "the minute you think it up you need to start planning for DMSMS." And of course, there is his pleading for engineers and "loggies" to work together. His many contributions to the DMSMS community include his work on the first Defense Logistics Agency semi-automated processing of a DMS case (the Motorola/Advanced Micro Devices case caused by the "Perry Memo"), the development of the cataloging filters and procurement guidance for Nuclear Hardness Critical Items, and the establishment of a very effective proactive DMSMS program for the B-2 weapon system, including orchestrating the multiyear buy based on proactive management of the aircraft bills of materials. Although he will stress the fact that it was a team effort, he will be most remembered for orchestrating the development of the first DMSMS courses, both instructor-led and computer-based training modules that have enabled the training of more than 8,500 students since 2005 in proactive DMSMS management basics.

**Pictured above are, left to right, Mr. Gregory Saunders, Mr. Charles "Chuck" Marshall, and Mr. Stephen Welby.**

# Individual Achievement Awards

Pictured above are, left to right, Mr. Gregory Saunders, Mr. Wade La Moureaux, and Mr. Stephen Welby.

**Wade La Moureaux** has managed the Space and C3I Systems DMSMS program for well over 5 years. The DMSMS program provides obsolescence support to the 20 diverse weapon systems within the 415 Supply Chain Management Squadron (Space and C3I). Under his direction, the Space and C3I Systems DMSMS program consists of a team of professional contractors (BAE Systems, Inc., and NCI Information Systems, Inc.). Over this past year, Mr. La Moureaux's performance has been exemplified through his expert leadership and management skills. The DMSMS program achieved a potential cost avoidance of more than $50 million, with a direct impact on the increased parts availability of over 17,000 managed items, which led to a 44 percent increase in mission-capable hours and an 18 percent reduction in back orders.

Pictured above are, left to right, Mr. Gregory Saunders, Mr. G.F. "Ric" Loeslein, and Mr. Stephen Welby.

**G.F. "Ric" Loeslein**, the branch head for the Naval Air Systems Command (NAVAIR) DMSMS Team, provides oversight and management. The team is the DMSMS focal point for NAVAIR, functions as an obsolescence/DMSMS asset to NAVAIR program offices, and works with DoD, Defense Logistics Agency, Naval Supply Systems Command, system commands, and industry to implement a strategic plan to mitigate the effects of obsolescence. Mr. Loeslein serves as NAVAIR's direct interface with these agencies through his participation on various DoD, Navy, and industry integrated product teams (IPTs). He has played an active role in DoD and industry efforts to mitigate the impact of counterfeit material infiltrating into the DoD supply chain by providing training to more than 500 NAVAIR artisans and technicians on identification techniques and by presenting awareness training to other government agencies and industrial groups. His efforts resulted in the establishment of a counterfeit awareness module in the certification course for all DoD miniature/microminiature technicians and a counterfeit awareness course at the Defense Acquisition University (DAU).

# Individual Achievement Award

Pictured above are, left to right, Mr. Gregory Saunders, Mr. Donald "Myrl" Leach, and Mr. Stephen Welby.

**Donald "Myrl" Leach**, the deputy branch head for the NAVAIR DMSMS Team, oversees the day-to-day functions of the team members as well as interfaces with all NAVAIR programs. In this position, Mr. Leach has completed 13 independent logistical assessments of major NAVAIR acquisition programs. These assessments include a detailed evaluation of the DMSMS activity to ensure that planning is in place, funding is identified, processes are established, and personnel are aware of their responsibilities. His thoroughness, as well as his ability to help the programs correct their deficiencies, has earned him the reputation as an outstanding evaluator, with numerous accolades from the programs. Mr. Leach was also instrumental in developing the DMSMS standard work packages and NAVAIR DMSMS certification programs. In addition to his competency functions, he is recognized in the DMSMS community as the "first responder." He is always willing to share his knowledge and provide insight to the various DoD and Navy committees he supports.

# Team Achievement Award

Pictured above are, left to right, Mr. Gregory Saunders, Mr. Vinh Phan, Mr. Greg Olson, Mr. Rick Cahn, Mr. Myrl Leach, Mr. Ric Loeslein, Mr. Howard Pinnell, and Mr. Stephen Welby. Team members not pictured are Ms. Helen Poag and Mr. Bill Marko.

The mission of the **NAVAIR DMSMS Team** is to mitigate the impact of total ownership cost on naval aviation and provide NAVAIR with a trained DMSMS work force. The team has been instrumental in addressing counterfeit awareness issues, including the need for training on identifying counterfeit microelectronics. The team worked with the NASA Jet Propulsion Laboratory to develop the first Navy counterfeit microelectronic recognition training program. This program was used as the basis for a module that is incorporated in the DoD Miniature/Microminiature Electronic Repair Program certification and annual recertification training program. The team also developed a NAVAIR DMSMS work force certification program and standardized work package. These programs enhance DAU's Defense Acquisition Workforce Improvement Act training by requiring additional DMSMS certification training and formalizing the essential information required for contract language.

# TEAM ACHIEVEMENT AWARDS

Pictured above are, left to right, Mr. Stephen Welby, Mr. Ron Wong, Mr. Matthew Washburn, Mr. Kenneth Houston, Mr. Richard O'Brien, Mr. Terrence Williams, and Mr. Gregory Saunders. A team member not pictured is Mr. Michael Davis.

The **Air Force B-2 Obsolescence Mitigation Team**, under the direction of Michael Davis, assembled an outstanding support team from NCI Information Systems and Principal Technologies, Inc., with extensive logistics, engineering, and supply chain expertise. In addition to government data sources, the team used the Supportability Management Assessment Reporting Tool (SMART) to obtain data from three commercial databases on more than 210 million parts. The team consolidated the various tool inventories into SMART in order to present a comprehensive picture of all assets available to support the B-2 weapon system. Using the SMART tool and the B-2 DMSMS management plan, the team reviewed, analyzed, and performed status actions on thousands of items resulting in a phenomenal 43.6 to 1 return on investment in the first 10 months and a cost avoidance of over $20 million.

Pictured above are, left to right, Mr. Gregory Saunders, Mr. Willie Brown, Mr. Brent Skeen, Mr. David Fordham, Ms. Sim Tran, Mr. Kyle Watkins, Ms. Debra Shepherd-Moore, Mr. Bob Legg, Mr. Royce Smith, Ms. Suzette Erickson, Mr. Keith Sandefur, and Mr. Stephen Welby. Team members not pictured are Ms. Kasey Wheeler, Mr. Brad Harness, Mr. David Foose, Ms. Dawn Leopard, Mr. Joe Whisenhunt, Ms. Melissa Crawford, Ms. Tracey Johnson, Ms. Brit Hendrix, Ms. Monica Mendoza, and Mr. Ron Marten.

The **Air Force Global Logistics Support Center (AFGLSC) DMSMS Team** (at Tinker Air Force Base) comprises both government personnel and contractor support personnel from BAE Systems and Northrop Grumman Corporation. Established in 2006, this team provided proactive DMSMS management for all Tinker-managed Air Force systems encompassing over 4,000 equipment technical orders. Through the use of automated DMSMS management tools and proven processes, the team resolved 17,480 DMSMS issues from October 2009 through July 2010. This resulted in a potential total cost avoidance of $67.7 million. A significant advancement occurred over this past year with the stand-up of DMSMS IPTs, consisting of members of the AFGLSC DMSMS Team and the Tinker weapon system IPTs. The DMSMS IPTs provide a greater degree of DMSMS focus to the overall life-cycle management of Tinker assets. They also provide the AFGLSC DMSMS Team with greater insight into weapon system management and planning, allowing it to develop DMSMS management strategies better tailored to individual systems and equipment.

# TEAM ACHIEVEMENT AWARDS

**Pictured above are, left to right, Mr. Gregory Saunders, Mr. Willie Brown, Mr. Ron Wong, Mr. Joseph Corbin, Mr. Bill Dodge, Mr. Wade La Moureaux, Mr. Tim Robbins, Mr. John Daily, Mr. Robert Hamilton, Mr. Rich Blackburn, Mr. Ronard Baxter, Mr. Russell Hunt, and Mr. Stephen Welby. Team members not pictured are Mr. Alan Cunningham, Mr. Michael Barr, Mr. Reese Dansie, Mr. Jeffrey Halvorson, Mr. Michael Jessop, Mr. Rex Butterfield, Mr. Stanley McFadden, and Mr. Dominic Moscarelli.**

The **Air Force Space and C3I Systems DMSMS Team** has been in place since February 2001. This team provides obsolescence support to the 20 diverse weapon systems within the 415 Supply Chain Management Squadron (Space and C3I). The Space and C3I Systems DMSMS program consists of a government program manager and a professional team of contractors (BAE Systems and NCI Information Systems). The team effectively implements the required functions outlined in the organization's DMSMS management plan. BAE Systems performs data mining, loads systems' bills of materials, and tracks the status of component obsolescence. NCI Information Systems provides the analysis and resolution of the critical proactive and reactive processes. The DMSMS team primarily consists of 17 on-site professionals, including electronics engineers, logisticians, technicians, and program managers.

## AAP-03J Becomes Effective

On January 1, 2011, Allied Administrative Publication 03 version J (AAP-03J), *Production, Maintenance and Management of North Atlantic Treaty Organization (NATO) Standardization Documents*, became effective and ready for use throughout the alliance. The purpose of AAP-03J is to establish procedures for the production, maintenance, and management of NATO standardization documents in accordance with NATO regulation. This new edition of AAP-03 introduces some changes to the current practices to better focus the standardization activities and deliveries on the achievement of the interoperability requirements pertaining to Allied capabilities. To access and download AAP-03J, visit ASSIST at https://assist.daps.dla.mil. Please direct all questions regarding AAP-03J implementation to Latasha Beckman at latasha.beckman@dla.mil, 703-767-6872.

## Newly Formatted PQM 103 Goes Live

After a successful pilot test, which was held at the Defense Acquisition University (DAU) campus at Fort Belvoir, VA, in January, PQM 103, Defense Specification Management, will go live on March 21, 2011, in Kettering, OH. This course covers policies and procedures for developing, managing, and using non-government standards, commercial item descriptions, and specifications and standards. The course—which emphasizes interoperability, market research, use of commercial and nondevelopmental items, use of performance specifications, international standardization agreements, and the single process initiative—has been condensed from a 2-week classroom delivery method to a hybrid online/in-class delivery method. DSPO, working with DAU, reformatted the course to reduce students' time out of the office.

When reformatting the course, DSPO and DAU pulled lectures out of the 2-week class where practical and turned them into continuous learning modules (CLMs). Now, students can learn about market research, the importance of standardization in the acquisition life cycle, and standardization documents from the convenience of their office by accessing the CLMs directly from the DAU website. (Please go to http://www.dau.mil and click Continuous Learning on the left side of the screen.) The CLMs, which are part of the Engineering and Technology Category (CLE), are as follows:

- CLE 028, Market Research for Engineering and Technical Personnel
- CLE 064, Standardization in the Acquisition Life Cycle
- CLE 065, Standardization Documents.

Each CLM can be completed in 2–4 hours.

After they have completed the three CLMs, students can enroll in PQM 103, which requires 2½ days in a classroom. The class provides students with lectures and exercises based on the information they learned from the CLMs.

For more information on DSPO course offerings, please go to the DSP website at http://www.dsp.dla.mil and click About Us and then click Training.

# Events

## *Upcoming Events and Information*

**August 14–18, 2011, Las Vegas, NV**

***60th Annual SES Conference***

The 60th Annual SES Conference will be held at the Encore at Wynn, Las Vegas, NV. The conference theme will be "The Evolving World of Standards: What's on the Horizon?" The conference includes a welcome reception, keynote address, and 2 days of technical sessions. Two professional development courses will be offered for an additional cost. The keynote address and technical sessions will be broadcast live from the Encore on August 15 and 16, 2011, as a virtual conference. If you are not able to make it in person, plan to attend virtually. For more information, please go to the SES website at http://www.ses-standards.org.

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

***DMSMS and Standardization Conference***

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

**October 13, 2011, Washington, DC**

***World Standards Day***

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

**October 24–27, 2011, San Diego, CA**

***14th Annual Systems Engineering Conference***

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

# People

## *People in the Standardization Community*

### Welcome

**Lloyd Thomas** recently joined the staff at DSPO as a management and program analyst. He comes to DSPO after a long career with the Defense Logistics Agency (DLA). Mr. Thomas worked with DLA Energy as a subject matter expert on for fuels transportation and inventory management, and he served overseas as a supply management representative. He also worked with DLA headquarters as a logistics management specialist working on foreign military sales, as a program analyst working on the logistics operations budget and some contract administration, and then as a budget analyst working on the information technology budget. Mr. Thomas spent 7 years in DLA Finance working with defense working capital funds, appropriated funds, and capital investment funds. At DSPO, Mr. Thomas has assumed responsibility for office business management.

**James Dwyer**, of the U.S. Army Materiel Command (AMC), was recently named the Standardization Executive for the Army, after serving as the acting Standardization Executive. Mr. Dwyer replaces Ron Davis, who had transferred to a new position with the U.S. Marine Corps.

**Bryant Allen**, of AMC, was named the Army Departmental Standardization Officer on December 8, 2010. Mr. Allen replaces Mr. Ramon Campos, who held the position previously.

### Farewell

**Diane Degrood**, of DLA Document Services, retired on December 14, 2010, after more than 30 years of federal service. Throughout her career, Ms. Degrood served in various positions. Most recently, she served as the program manager for ASSIST. We wish her well in retirement and will miss her dedicated service to DSP.


# Defense Parts Management Portal–DPMP

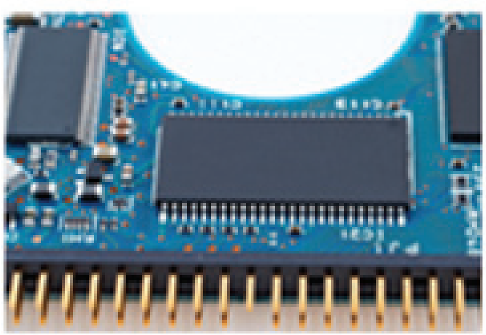
The DPMP is a new public website brought to you by the Parts Standardization and Management Committee (PSMC) to serve the defense parts management community.

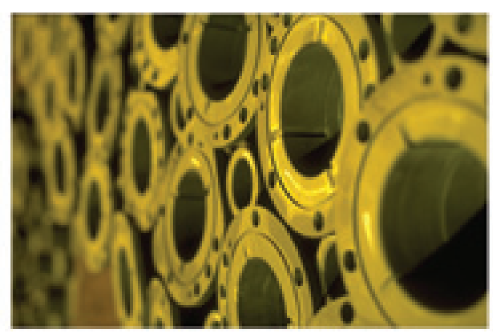
The DPMP is a new resource, a new marketplace, and a "one-stop shop" for parts management resources. It is a navigation tool, a communication and collaboration resource, and an information exchange. It gives you quick and easy access to the resources you need, saves you time and money, connects you to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

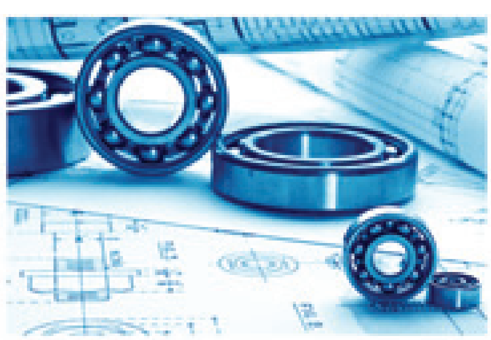
This dynamic website will grow and be shaped by its member organizations. A new and innovative feature of the DPMP is its use of "bridge pages." Organizations with interests in parts and components are invited to become DPMP members by taking control of a bridge page. Chances are good that your organization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

There is no cost.

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



# Upcoming Issues
## Call for Contributors

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

Following are our themes for upcoming issues:

| Issue | Theme |
|---|---|
| April/June 2011 | Standardization Stars |
| July/September 2011 | Materiel Readiness |
| October/December 2011 | International Standardization |

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

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


DEFENSE STANDARDIZATION PROGRAM
MAKING SYSTEMS WORK TOGETHER