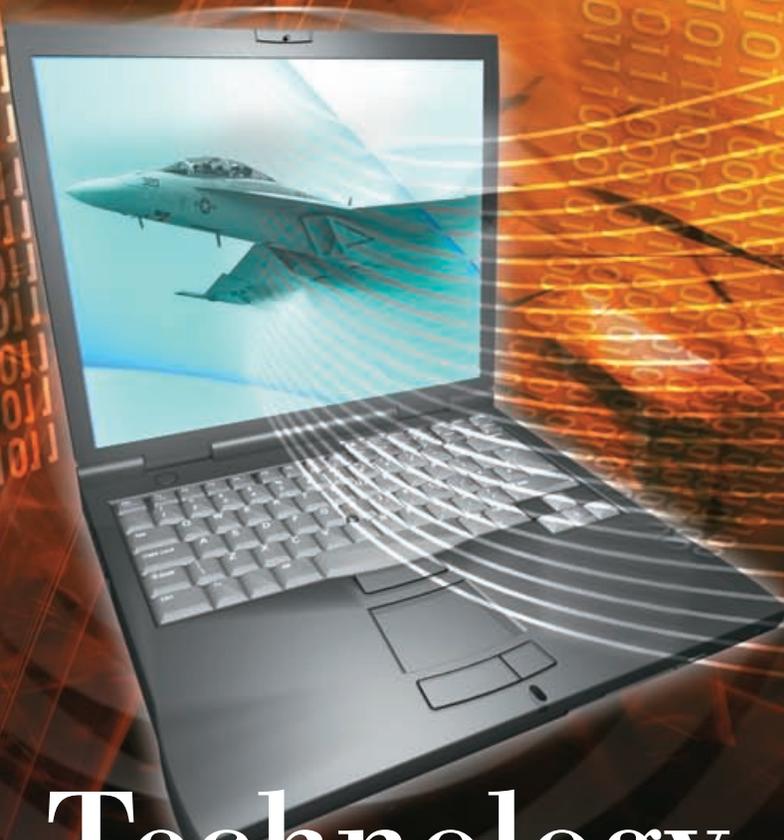


Defense Standardization Program

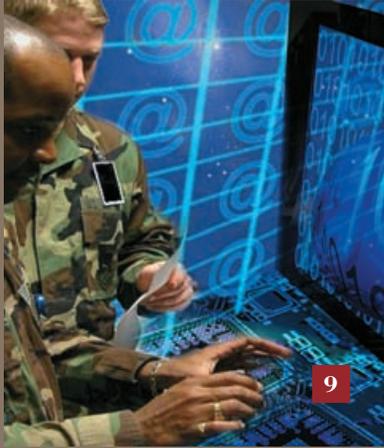
# Journal

April/June 2007



## Technology Standardization

Air Force Cyber Warfare Training  
An Effects-Based Metrics Framework  
Standardizing Air Force Base Networks  
around the Globe



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**Advances in technology, like any change, offer both great challenges and great opportunities. One only has to look around to see the enormous impact that technological advances have had on all of our lives.**

Technological discovery, development, and application make our daily lives better, if not always less complicated. The list is nearly endless. Here are a few examples:

- The Internet has fundamentally changed how we search for, exchange, and verify information.
- iPod—based on technologies for micro-hard drives, liquid crystal displays, lithium-ion batteries, Fast Fourier Transforms for signal processing, and so on, many pioneered and funded by DoD—has dramatically changed the way we carry music with us everywhere we go.
- Cell phones and PDAs with multiple additional functions have become ubiquitous.
- Flat-screen displays, helped along by DoD funding for weapon system displays, have found their way onto desktops and laptops and into living rooms as flat-screen televisions.
- Personal GPS receivers help us find our way.
- Automobiles have become safer, more comfortable, and more efficient due to incorporation of many different technological advances.

In the Department of Defense, technologies developed and brought from the laboratory to prac-

## TECHNOLOGY—TURNING A WILD IDEA INTO A PRACTICAL APPLICATION

tical use over the course of many years have given us superiority in numerous critical defensive and offensive capabilities. Stealth technology; information collection, analysis, exchange, and use; net-centric warfare capabilities; unmanned vehicles; precision guided munitions; and advanced personnel protection are just a few of the ways that technological development has led to battlefield superiority.

But taking technology from someone's wild idea or dream to practical application is no trivial issue. Selecting which ideas to pursue or which



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

solutions on which to standardize is as difficult as picking winners in a horse race. In the battle between VHS and Beta, some portions of DoD decided to standardize on U-Matic. There was a good argument that it was a superior format, but in the end, it never gained market acceptance.

To fully appreciate the technological advances we make, it is instructive to look behind the curtain and see how technologies are brought from a wild idea to fielded, force-changing technological capability. Though not the only way that it happens, one disciplined approach to track technological progress is through the use of Technological Readiness Levels (TRLs). As outlined in *Defense Acquisition Guidebook*, the step-by-step TRL process, which is intended to assist managers with making smart decisions that will ultimately benefit DoD, is as follows:

- *Step 1—observation and reporting of basic principles.* Scientific research begins and is translated into an implied research and development phase that may describe basic properties.
- *Step 2—formulation of technology concept and application.* Application is still speculative and no proof is offered to support basic assumptions.
- *Step 3—critical function and proof of concept.* Typically, this includes physical validation to analyze predictions.
- *Step 4—component and breadboard validation in the laboratory.* Components are integrated to establish that pieces will work together, at least in the laboratory.
- *Step 5—component validation in relevant environment.* Basic components are integrated

with reasonably realistic supporting elements so that the technology can be tested in a simulated environment.

- *Step 6—model or prototype demonstration in a relevant environment.* The model is tested in its relevant environment.
- *Step 7—system prototype demonstration in an operational environment.* The system prototype is demonstrated in an actual operational environment.
- *Step 8—actual system completion and “flight qualification” through test and demonstration.* At the end of system development, the technology is proven to work in its final form and under perceived conditions. This typically includes developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.
- *Step 9—use of the actual system in successful mission operations.* The technology is applied in its final form and under mission conditions.

Bringing technology to fruition is a long and complex process. As B.F. Skinner said, “the real problem is not whether machines think but whether men do.” Technology can’t be applied to real problems unless men and women figure out how to use it effectively. This issue of *Defense Standardization Program Journal* illustrates a few examples of the practical application of technology to real problems and issues faced in the Department of Defense.

# Air Force Strategic Sourcing Initiative Delivers Far-Reaching Standardization

By Deborah Sackman



The Air Force's Information Technology Commodity Council (ITCC) Desktop/Laptop (DT/LT) strategic sourcing initiative enables the Air Force to reap the benefits of quarterly enterprise-wide buys—managed PC hardware and software standardization, including improved network security, improved warranty support, and streamlined application development activities. The monetary savings have been a major benefit as well. In just 3 years, the ITCC DT/LT initiative has delivered more than \$85 million in cost avoidance associated with the purchase of more than 308,000 PCs. This substantial cost avoidance remains within each major command (MAJCOM) to be used to support other mission-critical needs.

The DT/LT initiative makes a valuable contribution to Air Force operations by carefully monitoring results and applying a continuous improvement approach to the program. Part of the effort involves shifting the perception of the user community from viewing PCs as personal computing devices to a mindset that views computers as a means to enable critical enterprise network capabilities for the Air Force.

Successful standardization programs create ripple effects that extend benefits well beyond their core area of focus. The Air Force's standardization efforts increase organizational productivity, value, and flexibility by reducing otherwise cumbersome processes and allowing personnel to more effectively perform their mission and day-to-day operations.

### **Establishing a Framework for Improved Processes and Purchasing Management**

The Air Force established the ITCC in July 2003 to leverage its buying power, improve capability, increase standardization, and reduce the overall cost of IT ownership. The organization develops and oversees IT commodity buying, contracting, and life-cycle management strategies. By using strategic sourcing to enable the Air Force to define a standard computing platform and simplify enterprise life-cycle support for mainstream PCs, the ITCC DT/LT initiative significantly lowers the overall cost of PC ownership and operation, enables the Air Force IT infrastructure to better support network-centric operations, and develops an expanding base of satisfied users.

To establish a consistent approach to PC purchases, the ITCC developed and implemented a Quarterly Enterprise Buy (QEB) program, a sourcing strategy that applies standardized business processes to PC purchases. Approved by the Air Force Chief of Warfighting Integration and Chief Information Officer and the Deputy Assistant Secretary of the Air Force for Acquisition, the ITCC DT/LT commodity strategy leverages Air Force enterprise purchasing volume and standardizes the hardware and software configurations of mainstream PCs.

Semiannually, the ITCC reviews Air Force buying standards and works closely with seven strategic suppliers to develop an 18-month technical road map for the buying standards. The road map helps the ITCC determine the appropriate time to change the buying standards. PCs meeting these standards are meant to support mission activities for the targeted life cycle of the hardware (at least 3 years for laptops and 4 years for desktops). Formal changes to Air Force buying standards are coordinated through the ITCC and approved by the Air Force Architecture Integrated Process Team.

The QEB has had a significant impact on strategic PC suppliers to the Air Force in terms of price competition for orders, reducing the current price of a mainstream desktop computer to less than \$500. To date, the percentage of systems delivered through the QEB is 46 percent from Hewlett-Packard, 41 percent from Dell, 7 percent from IBM/Lenovo, and 6 percent from Gateway.

### **Standardizing Hardware, Software, and Life-Cycle Management**

The QEB program initially established mainstream buying standards for enterprise PC hardware configurations and used the quarterly purchase process to promote and help enforce the purchase of new mainstream computers. By first establishing standard hardware configurations, the ITCC could then address the issue of standardized Air Force software configurations.

The ITCC determined that establishing a standard desktop configuration would provide numerous security, operational, and cost benefits. Doing so would require the entire Air Force to use a limited number of versions of Microsoft software, the predominant desktop operating system. This was a driving factor behind the Air Force establishing a single enterprise license agreement with Microsoft, which not only provided the licensing capability to establish a standard desktop configuration, but also led to a cost avoidance of more than \$100 million through FY10. It also ensured that the Air Force could require QEB vendors to ship Air Force-purchased computers with the standard desktop software configuration, thereby improving the security posture of the network. Finally, it facilitated the Air Force's move to a single Designated Approval Authority for certifying and validating a commercial off-the-shelf product only one time for use throughout the entire Air Force network.

Establishment of the Microsoft enterprise license enabled the next step: a software configuration standard for cross-platform connectivity and security, thus enabling the Air Force to reengineer its processes and reducing the time to deploy software security patches from weeks to hours. The Air Force will take the next step in 2007 when it will move to a "comply and connect" network security environment. Ma-

chines that attempt to connect to the network will first be analyzed. Machines that do not meet the minimum requirements will be quarantined and afforded the opportunity to become compliant before connecting to the network.

Before establishing an enterprise Microsoft license, various Air Force individuals and organizations used many different operating system versions with varying licensing rights, which adversely affected their ability to upgrade to newer versions. With the Microsoft enterprise license initiative in place, the Air Force now has a streamlined process for acquiring and implementing PCs with a common software baseline, as well as a greatly improved foundation for application test and evaluation procedures.

A standardized master software image provides a baseline software image for computer shipments, simplifies network management, and reduces complexities and unknown variables for help desk and support personnel. As a result, the Air Force now possesses a baseline Microsoft software image that can be distributed to hardware vendors for each QEB. This same software image is also being installed on PCs in current use around the Air Force. Bases can now develop installation packages for specific applications—thus reducing the time, effort, complexity, and amount of work required to support the products added to the standard desktop—because personnel already know the specific baseline for all computers.

Building upon these accomplishments, the DT/LT initiative is also addressing life-cycle standards by developing and implementing standard vendor-provided asset tagging and is currently assessing options for PC disposition. Planned 2007 efforts include providing advanced enterprise configuration management that addresses rapid security patching, mandated minimum operating hardware standard configuration requirements, and enhanced compliance and connectivity capabilities.

### **Focusing on Processes and Strategy to Implement Standards**

The ITCC DT/LT initiative developed and implemented a buying strategy, a contract strategy, the QEB process, and a life-cycle support strategy. The initiative has significantly improved return on investment and reduced the total life-cycle cost of PC ownership by focusing on managed mainstream configurations that support the vast majority of users.

Although some software requirements may not be compatible with a minimum configuration, the process helps identify these gaps so they can be addressed in a more predictable manner in future purchases. All standards apply not only to the QEB purchases, but also to urgent requests between QEBs. Even urgent requests,

however, require waivers from MAJCOM/functional chief information officers and must be purchased through AFWay, the Air Force IT e-procurement site.

The ITCC QEB strategy establishes relationships with strategic suppliers while still enabling competition at the per-order level. The blanket purchase agreements are for 5-year terms that have annual reviews and options. The agreements enable the Air Force to establish relationships with strategic suppliers, conduct order-level competitions, and effectively manage the resulting purchases. Agreements are negotiated with seven enterprise suppliers, which include four large and one small business original equipment manufacturers and two small business resellers.

The Air Force is able to centralize the ordering process and choose the best value among competing suppliers by using the QEB process. The QEB realizes vastly improved cost avoidance over contracts that might otherwise be negotiated at the command level or in single-purchase transactions because the competition is at the

By building upon early successes and focusing on incremental results, the program has consistently achieved its yearly objectives by delivering greater value to Air Force operations and improved customer satisfaction.

level of the entire Air Force. The ITCC also uses a cyclical process to update minimum operating and purchase configurations to provide advantages unavailable to organizations and individuals making standalone purchases.

### **Employing a Continuous Improvement Approach to Enable Expanded Benefits**

The ITCC continuously evaluates the current market and revises its purchasing strategy according to current conditions. The continuous improvement approach used by the ITCC enables it to devise and implement a strategy that takes advantage of evolving market developments and lessons learned.

Like all programs that strive to implement new business processes, the ITCC knows the value of maintaining senior leadership sponsorship at Air Force Headquarters and the MAJCOMs. Stakeholder representatives to the ITCC include all MAJCOMs as well as key functional and special-interest representatives. The MAJCOM ITCC members have been essential to the success of the ITCC.

The ITCC has also ensured that communication initiatives deliver the information that the user community needs to understand the benefits of the program. By building upon early successes and focusing on incremental results, the program has consistently achieved its yearly objectives by delivering greater value to Air Force operations and improved customer satisfaction.

The ITCC and QEB are best-practice examples of how reengineered processes can be used to influence purchasing behavior and motivate personnel to adopt new business processes. By enabling the Air Force to realize the benefits of predictable pricing with increasing technology capabilities and controlled evolution of standards, the ITCC and QEB have increased the ability of the Air Force to more efficiently carry out its mission.

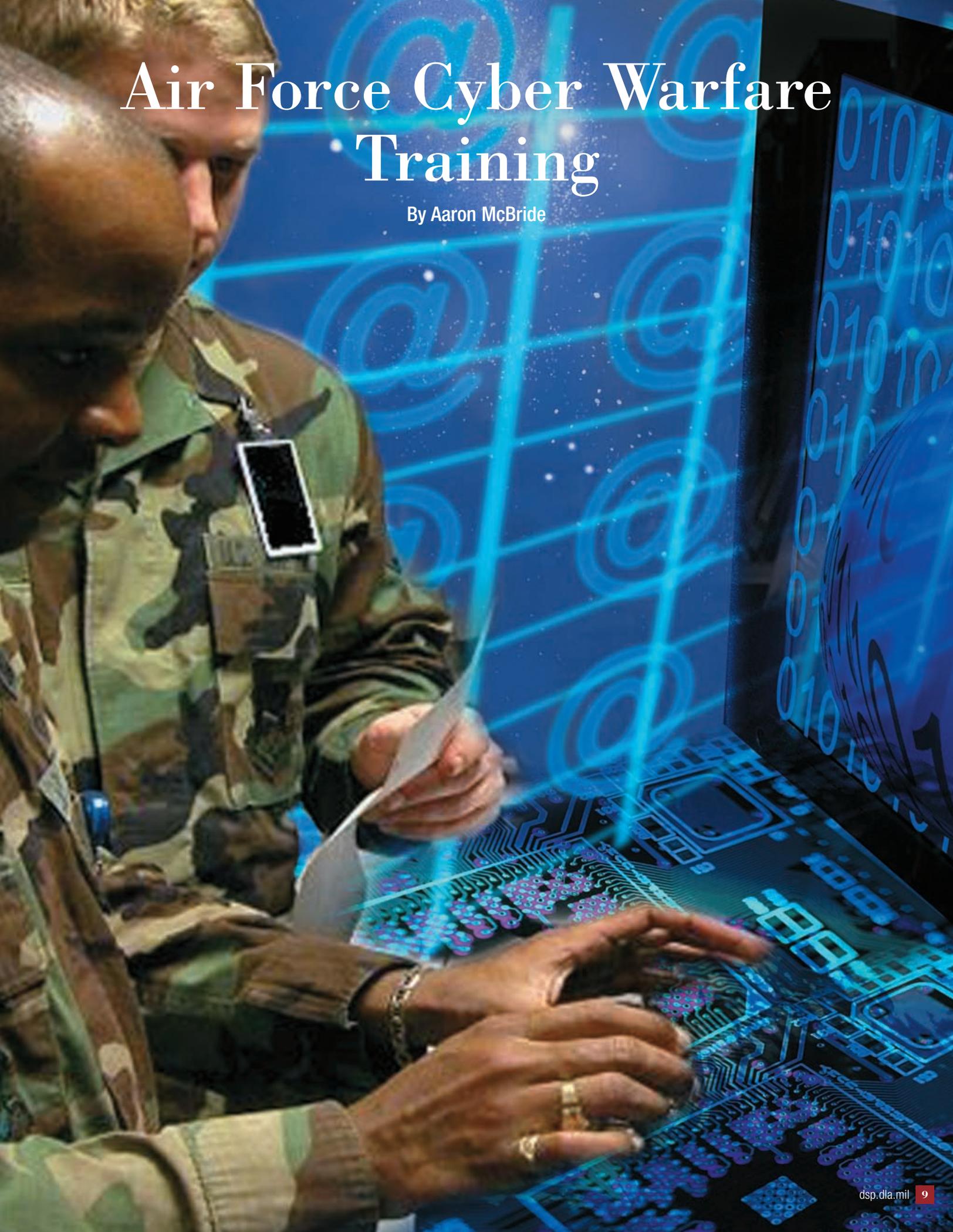
For more information on the Air Force ITCC DT/LT program, please see the ITCC QEB website: <https://www.gunter.af.mil/acquisitions/kai/kaih/qeb/>.

#### **About the Author**

Deborah Sackman, an IT business initiative consultant from General Dynamics Information Technology Corporation, serves on the staff of the U.S. Air Force Office of Warfighting Integration and Chief Information Officer, Enterprise Services Division. Ms. Sackman's experience ranges from life-cycle application development on small to large enterprise projects, to establishment and management of help desk operations, to technology assessment and insertion, to IT and business strategic planning and execution. ✨

# Air Force Cyber Warfare Training

By Aaron McBride



Imagine you've recently been assigned to an integrated network operations and security center as an Air Force network defender. You're reviewing various statistics on the "health" of the network on your enterprise monitoring software, including firewall activity and the gateway servers. All of a sudden you receive an alert that an unauthorized account has been granted administration-level access to the domain controller server. Within 10 minutes, your office is flooded with calls from help desk crews throughout the major commands (MAJCOMs) because thousands of user accounts have been permanently locked. Then you discover that one of the base firewalls is down. Shortly thereafter, the second one fails, leaving your base network isolated from the Air Force network and the rest of the world. The infrastructure technician reports the base gateway server is down. The entire crew is tense. MAJCOM representatives and your crew commander are demanding answers. What's going on and what do you do? Luckily, the training instructor calls out for a PAUSEX (pause exercise) and the automated network attack immediately stops. You're grateful that it wasn't real. This scenario is only one of many that the Simulator Based Training and Exercise Program (SIMTEX) provides to Air Force cyber warriors.

### **SIMTEX Simulator Range at Scott Air Force Base**



### Network Crews during Black Demon Exercise (at the Scott Air Force Base SIMTEX node)



Since the early 1900s, aircraft simulators have been used to train pilots, helping to develop their skills and prepare them for using aerial weapons systems. Modern aircraft simulators provide flight crews a realistic training environment similar to what they would experience during actual combat operations. Airborne weapons-platform simulators support a wide range of activities, from individual flight training to entire squadrons operating together. Just like aircrew simulators, the SIMTEX simulator provides a risk-free environment that allows crews to train and exercise at the individual, unit, or multi-organizational level.

Lessons learned from the Vietnam War taught us that combat operations are not the correct venues for training personnel. During Vietnam, in an effort to improve poor kill ratios, the Air Force activated Exercise Red Flag to provide pilots the necessary instruction and practice to increase their combat skills. Similarly, in 2002, the Air Force Information Warfare Center (now the Air Force Information Operations Center), in concert with the Air Force Communications Agency (AFCA), developed and conducted the first Air Force network defense exercise, Black Demon—referred to as BD 2002. This exercise provided participating Air Force network defenders their first 10 cyber warfare combat “sorties” and prepared them for network crew positions.

Four MAJCOMs participated in BD 2002. The Air Force did not have a simulator then, so each MAJCOM built one from whatever equipment

they could spare. The resulting simulators were dissimilar, which resulted in nonstandard scenarios and contrasting exercise results. The primary lesson learned from BD 2002 was that the Air Force needed a single network simulator to normalize training and enhance network defense tactics, techniques, and procedures. The great success of the annual training exercise led to implementation of SIMTEX simulators, mimicking the current three-tiered Air Force network architecture, and expansion to participation from all services in Joint Exercise Bulwark Defender.

Since the simulator is separated from the operational network, network mission operations are not affected by SIMTEX exercises. This separation also allows for simulating risky activity. AFCA deployed equipment that provides a standard simulator at each training location and can be used in a variety of training venues. One feature of the simulator is its ability to provide automated attack scenarios that can be rebaselined in 10 minutes or less. Adding to the simulator's realism is the unique feature of the intra-network of simulators and a functional SIMTEX "Internet," complete with domain name system resolution and simulated real-world websites like CNN and Google.

When the SIMTEX simulator is not being used for AFCA-sponsored training events or an Air Force or Joint exercise, it is made available for crew training and MAJCOM standardization and evaluation programs. Part of the SIMTEX training package is a train-the-trainer component for MAJCOMs to conduct just-in-time training or to evaluate their personnel. The SIMTEX simulator is designed to be flexible, allowing multiple training and exercise formats that in-

## Permanent Node Locations

Air Combat Command	Air Force Space Command
Air Education and Training Command	Air Force Special Operations Command
Air Force Information Operations Center	Air Mobility Command
Air Force Materiel Command	Air National Guard
Air Force Network Operations Center (National Center for Documentation, Network Outward Dialing, Network Security Division)	Pacific Air Forces
Air Force Reserve Command	Recruit Training Squadron, Keesler Air Force Base
	United States Air Forces in Europe
	Vermont Air National Guard

clude training individuals on specific tasks; training crews on tactics, techniques, and procedures; and training multiple organizations at the various network tiers. Additional locations can also be remotely connected into the SIMTEX network with little cost or effort. (Figure 1 shows simulator locations.)

**FIGURE 1. SIMTEX Simulator Locations**



AFCA has partnered with the formal Air Force education and training schoolhouses, providing the laboratory environment to reinforce lesson objectives using current network threats, vulnerabilities, and mitigation tactics. SIMTEX simulators support operations training for Air Force enlisted communications personnel charged with piloting our Air Force networks, and they support advanced networking courses for other Air Force personnel. The simulators also support the Blended Advanced Distributed Learning Network developed by the Vermont Air National Guard, which provides instructor-led online classes and network warfare courses at the 39th Information Operations Squadron.

As the Air Force continues to extend its global reach and global power into cyberspace, SIMTEX will continue to provide trained combat-ready forces to conduct cyber operations.

#### **About the Author**

2nd Lt. Aaron McBride is the lead simulation training and exercise officer at the Air Force Communications Agency, Scott Air Force Base, IL. In this position since March 2006, he has participated in Air Force Exercise Black Demon 2006 and two MAJCOM SIMTEX exercises. He provides state-of-the-art network operations and computer network defense training to MAJCOM Network Operations and Security Center and base Network Control Center crews Air Force-wide. ✨

# DMSMS Working Group Reaches Out to Programs

By Jim Jenkins



**P**Engineers and logisticians at the Naval Air Systems Command (NAVAIR) are working together—through NAVAIR’s Diminishing Manufacturing Sources and Material Shortages (DMSMS) Working Group (WG)—for the common good. Now, stovepipes are crumbling, and swim lanes are being crossed.

The NAVAIR DMSMS WG, led by the Aging Aircraft Enterprise Division and the Design Interface and Maintenance Planning Division, was established to serve as an enabler for program teams in developing a synergism for mitigating the effects of DMSMS. This is accomplished by filtering down Department of Defense (DoD), Department of the Navy (DoN), and Deputy Assistant Secretary of the Navy for Logistics (DASN-L) policy; defining processes for coordinating DMSMS mitigation strategies with technology road maps; providing training opportunities; and identifying barriers. It also serves as a forum for NAVAIR DMSMS socialization.

The NAVAIR DMSMS WG’s goal is to establish a standardized NAVAIR “best practices” process to help all programs develop a “best method” in addressing DMSMS matters. To achieve that goal, the WG brought together personnel from virtually every NAVAIR program office to share information and experiences in relation to DMSMS. By sharing information such as the challenges facing the various programs, their successes, barriers, and most important, lessons learned, the WG is establishing a synergy among the programs in an effort to make DMSMS problem solving a more efficient process for all NAVAIR.

“The Aging Aircraft Enterprise Division has been a leader in the Department of Navy’s efforts in implementing Assistant Secretary of the Navy for Research, Development and Acquisition policies and guidance in mitigating the risk of DMSMS,” said Capt. Joe Spruill, Chief of Staff for DASN-L. “Their efforts in providing direct support to NAVAIR program offices to proactively manage DMSMS, as well as providing DMSMS awareness and mitigation training have undoubtedly resulted in significant cost avoidance throughout NAVAIR as well as the entire Navy Department.”

Representatives from 90 percent of NAVAIR’s programs are meeting on the second Thursday of every month at Wyle Laboratories, Inc. in California, MD, to discuss DMSMS matters and share information.

A big issue, and one of the first to be tackled for the respective programs, was how to incorporate Program Objectives Memorandum (POM) planning processes for their DMSMS matters. The February WG meeting included a “POM Planning for DMSMS” presentation from Ezell “T” Westbrook, Aging Aircraft Non-Program Related Engineering financial management support, who explained the Air Sys-

tems Support Requirements Determination process. Each program is required to include DMSMS money in the POM, separately from their other POM efforts. The FY10 POM is the first opportunity for the programs to report their complete DMSMS funding requirements. In attendance was John McKendrew, Air System Support Team Lead, who provided inputs for the presentation and was there to answer any questions.

Previous meetings have included briefings from Naval Sea Systems Command officials concerning the Obsolescence Management Information System, the DASN-L staff, the Tomahawk Weapons Control program, and various companies demonstrating tools that help with obsolescence management.



Not only has the WG succeeded in breaking down barriers within NAVAIR, but the Aging Aircraft DMSMS team is helping the Marine Corps establish an infantry-related WG of their own and is collaborating with the Air Force...

“I think Navy in general and NAVAIR in particular are poised to achieve great results in pursuit of efforts to mitigate the impact of DMSMS because they have policy, strategy, implementation and oversight in alignment,” said John Becker, Chairman, DoD DMSMS WG. “The only thing left for Navy to do is the hard part of getting programs to change their ways. That takes a dedication to the oversight process that is well established and showing more positive results with every week.”

NAVAIR’s DMSMS WG has proven successful since it was implemented. Since September, the NAVAIR community has been provided more than 2,000 man-hours of DMSMS training through the following instructor-led Defense Acquisition University courses: DMSMS Fundamentals, DMSMS for Executives, Defense Logistics Agency Essentials, and DMSMS Case Studies. These courses are very much in demand, according to Howard Pinnell, Aging Aircraft DMSMS technical analyst. Working Group members will soon be able to take the DMSMS for the Technical Professional and Logistician courses, as well.

In addition to those courses, more than 40 NAVAIR DMSMS WG members have been trained in using the Logistics Planning and Requirements System (LOGPARS) DMSMS Plan Generator tool, which is said to be as simple as the popular TurboTax program to fill out and complete. The LOGPARS DMSMS Plan Generator tool helps members draft their program DMSMS Management Plan that, if filled out correctly, fulfills all of the DASN-L requirements.

Along those same lines, the newly created NAVAIR DMSMS reference book is considered by many in the NAVAIR community as the bible for WG participants. It teaches, in a step-by-step process, how to create and manage DMSMS programs, plans, and metrics. The reference book is a compilation of DoD and DoN DMSMS directives, policies, procedures, guidebooks, and resources.

“This material provides the DMSMS program manager with a desktop reference to quickly pinpoint key documents required in managing DMSMS issues and concerns,” said Robin Brown, Aging Aircraft DMSMS management analyst.

Cross-communicating is perhaps the biggest benefit the NAVAIR DMSMS WG has to offer. No program should “go it alone,” since many of the piece parts and some of the larger components and systems used in Navy aircraft are common to one another. If one program has already researched a DMSMS issue, another program does not have to repeat the same research to solve its issue.

Belinda Rhoten, of NAVAIR’s Air Combat Electronics program office, noted that the DMSMS WG has been helpful with respect to facilitating networking and meeting other teams that are working obsolescence. “It has been a benefit for us to meet with other people and make points of contact.”

It is about working together for the common good and sharing knowledge. Not only has the WG succeeded in breaking down barriers within NAVAIR, but the Aging Aircraft DMSMS team is helping the Marine Corps establish an infantry-related WG of their own and is collaborating with the Air Force, sharing all obsolescence case data to piggyback on each service’s successes.

“The biggest benefit to the WG is for programs to identify their barriers and frustrations in dealing with DMSMS,” said Ric Loeslein, Aging Aircraft DMSMS team lead. “As a WG, we are able to learn from each other in addressing and eliminating these issues. We all understand that mitigating DMSMS requires teamwork between logistics and engineering disciplines.”

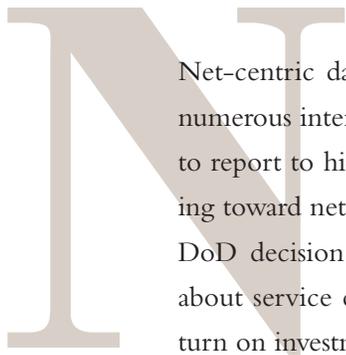
### **About the Author**

Jim Jenkins, a member of the Aging Aircraft Enterprise team, has worked in public affairs at the Naval Air Systems Command Patuxent River for the past 12 years. For 10 of those years, he was senior writer, then editor, of the NAS Patuxent River base newspaper, *Tester*. Before spending the last year supporting NAVAIR’s Aging Aircraft Enterprise team, Mr. Jenkins performed public affairs work for NAVAIR’s various research, development, test, and evaluation organizations. ✨

# An Effects-Based Metrics Framework

Measuring Progress toward  
a Net-Centric DoD

By Mary Ann Malloy



Net-centric data-sharing implementation guidance for DoD, issued in 2006, cites numerous intended uses for metrics.<sup>1</sup> Stakeholders throughout DoD are being asked to report to higher echelons about their respective organizations' progress in evolving toward net-centric data sharing and operations, as well as other enterprise goals. DoD decision makers will regularly gather and analyze data to answer questions about service quality and user satisfaction, capability delivery and performance, return on investment, prioritization, and other matters yet to be determined.

The metrics must be comparable, consistent, and replicable from one assessor to the next to poise them for objective, integrated interpretation across DoD. DoD should “practice what it preaches” and bring net-centric principles to bear on the task of developing appropriate metrics for measuring progress toward agreed-upon organizational goals, including the net-centric vision.

A standardized approach to metrics will enable cross-organizational progress comparisons as well as integrated rollup, a consolidated, instantaneous snapshot of progress toward meeting goals based on reports drawn from key contributors, or even across the entire DoD enterprise. This article describes how to construct such metrics in the context of an overarching framework that ensures their relevance and meaningfulness to DoD decision makers. It also argues that developing metrics services under the purview of an institutional community of interest (COI) is an implementation approach consistent with prevailing DoD net-centric thinking.

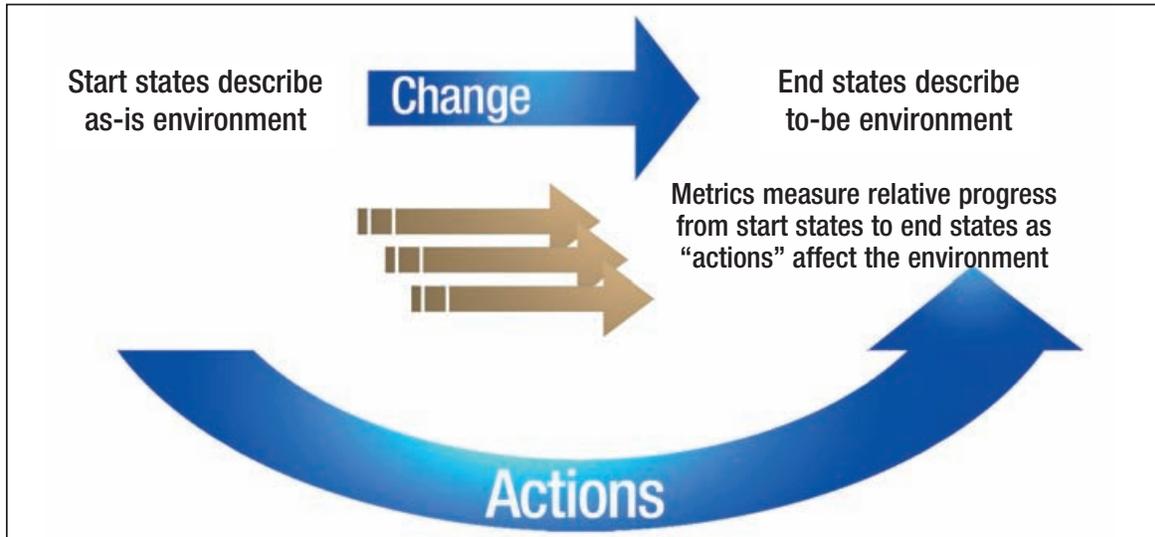
### **An Effects-Based World View**

Frequently, metrics are defined in a relatively ad hoc manner to respond to a particular decision maker's “pet rock.” Or, a glut of data may be collected because it is easy or expedient to do so. In other words, not a great deal of thought may go into choosing or committing resources to metrics in relation to how useful (or not) their readouts turn out to be.

A framework for metrics that will be strategic, efficient, and practicable in a wide variety of contexts across DoD can be modeled after the net-centric warfare assessment approach embedded in effects-based operations (EBOs). The framework is built around a few key concepts, depicted graphically in Figure 1.

The EBO world view reflects a change in the way DoD thinks about operational environments and how to plan and conduct operations. DoD now recognizes an environment that is a rich complex of interrelated cause-effect relationships; therefore goals and actions are defined and executed holistically in many different aspects of the environment, including traditional military behaviors and physical states.

FIGURE 1. Notional Framework for Effects-Based Metrics



Typically, start states describe undesirable conditions in the current, or “as-is” environment. By contrast, end states are the projection of the commander’s intent and describe desired conditions in the future “to-be” environment upon successfully completing the operation. Metrics measure changes along a continuum described by pairing start states and end states.<sup>2</sup>

### **An Effects-Based Metrics Framework**

The idea for a more generalized effects-based metrics framework begins by extending the principles of EBO to the general problem of defining relevant and meaningful metrics in the context of any environment, not just a tactical one. A fundamental premise of this adaptation is that any collection of agreed-upon goals can be used as an analog to the projection of the commander’s intent into the to-be environment. These goals form the basis of the desired end states for the enterprise. Start states, actions, and metrics are developed consistent with the EBO approach; the only real difference is that the environment being assessed does not need to be a tactical one.

To confirm the reasonableness of the proposed adaptation, let’s walk through a nontactical example that applies the effects-based metrics concept to the challenge of assessing DoD’s progress toward realizing the net-centric vision.

### **A Simple Metrics Use Case**

The DoD Net-Centric Data Strategy (NCDS) establishes a small number of now well-known tenets for the data management aspects of net-centric transformation.<sup>3</sup> These high-level goals call for DoD to make its information resources accessible, visible, understandable, trusted, interoperable, and responsive. Let’s choose just one of the many possible threads and weave it into the framework.

The “visibility” tenet states that DoD information assets must be discoverable by authorized users. The first few elements of the framework are relatively intuitive:

- *Start state.* Only some DoD information assets are discoverable by authorized users.
- *End state.* All DoD information assets are discoverable by authorized users.
- *Actions to achieve this goal.*
  - Producers must inventory their assets.
  - Producers must prioritize the assets they will expose (or make visible) to authorized users.
  - Producers must expose their assets in high- to low-priority order.

DoD must establish what it means for an asset to be “exposed” and “discoverable.” It also must establish a consistent prioritization scheme for its assets to execute these actions. The following is a notional rating system:

- High—expose within 6 months
- Medium—expose within 12 months
- Low—expose within 18 months
- No—asset not slated for exposure (for example, it has no relevance outside the producer community).

This rating system ensures that results for asset discovery are comparable across all producers who report their progress to the DoD enterprise. Stakeholders may be free to use their own internal processes to decide which of their assets have which priority and where and how to expose them. Alternatively, DoD may establish some core criteria and directive procedures for choosing which assets to make visible, how, where, and when. Additional constraints like these help ensure that actions are executed consistently by all the stakeholders.

Next, relevant metrics are incorporated into the framework to scrutinize progress from start states to end states. This can be done from any of a number of different stakeholder viewpoints. In this example, producers may want to answer the question: What percentage of my high-priority assets have been exposed as of today? Or the DoD Chief Information Officer may wish to answer the question: What is the average percentage of all high-priority assets exposed across the enterprise?

The elements of the framework provide the context—a shared understanding of the key concepts and definitions relevant to asset visibility—that gives these questions meaning. Simple, quantitative metrics and a small amount of data collected from the stakeholders (for example, total number of assets and number of high-

priority assets) support answering the questions listed above, as well as many others about DoD's progress toward achieving asset visibility.

### **Now, for the Net-Centric Part**

In the use case, we looked at one possible thread associated with one NCDS goal and just a few possible metrics derived from actions to pursue that goal. Obviously, many of the NCDS goals are interrelated. For example, the goals of visibility (exposure) and accessibility are linked. Actions taken by producers to expose their assets will also affect accessibility. These holistic net-centric linkages are implicitly built into the effects-based metrics framework.

Another net-centric characteristic of the effects-based framework is how easily it may be extended to incorporate additional metrics to measure progress in any other aspect of the environment deemed relevant by decision makers. The metrics—all defined within the same contextual framework—provide an objective basis for making rational resource decisions, especially when corrective actions are needed to accelerate progress in lagging areas of the complex environment.

### **Rationale for the Framework**

At this point, we've talked about EBO foundations and the principles of effects-based assessment. We showed how to adapt this approach to the problem of building a generalized effects-based metrics framework for assessing any environment with respect to goals. We also walked through one small piece of constructing such a framework to assess a nontactical environment interesting to stakeholders in the net-centric DoD.

The framework approach ties metrics to enterprise goals. This is an important observation! Just because a metric is easy to collect or seems interesting to an individual is insufficient rationale for committing enterprise resources to collecting and analyzing it. More important, a metric must support insights that are meaningful and relevant to those who interpret them. The metrics framework ensures that this is possible by deriving all metrics from organizational goals in a context of agreed-upon concepts. This ensures that the pedigree of each metric traces back to the organizational goal it measures.

Individual components within the enterprise of course are free to collect additional metrics outside the context of the framework for their own purposes, if they so desire, but they should provide their own resources to do so. For efficiency and economic reasons, only metrics that are tied into the framework merit the commit-

ment of scarce enterprise resources. The framework helps decision makers discriminate between metrics meaningful to the enterprise versus those motivated by individual, parochial concerns.

### **Evolution of Metrics**

This assessment approach, rooted as it is in EBO, accommodates the potential for negative progress. Metrics help correct for this effect by providing decision makers with visibility into other areas of the observed environment that may be interacting in an unanticipated, undesirable way with ongoing actions. This helps identify opportunities where pursuing new, alternative courses of action can correct for negative impacts.

Similarly, as the observed environment changes, some of the end states will be successfully accomplished, so associated actions are no longer required. The metrics originally inserted for monitoring changes in those states are no longer needed either, so they can be deprecated (retired) from the framework. Other new, unanticipated relevant conditions may come to light in the changing environment, so new states, actions, and metrics must be added.

The cycle of expressing start and end states, planning appropriate actions to effect change, and linking in new metrics to measure the impacts of those actions is repeated continuously. In this way, the framework and the metrics defined within it are inherently adaptive to the ever-changing observed environment.

### **Maturing the Metrics Framework Concept**

Obviously, the applicability of an effects-based metrics approach is not restricted to measuring progress toward the net-centric vision. This article used the net-centric environment as a nontactical use case because its goals are widely understood throughout DoD. A similar effects-based metrics framework is under review by COI stakeholders as the basis for developing their plan to fulfill metrics collection, integration, and reporting obligations to the DoD enterprise.

Stakeholders must give some thought to an appropriate, standard approach for creating meaningful metrics visualizations (dashboards, meters, stoplight charts). Many decision makers want to see metrics condensed onto a single 8½-by-11-inch sheet of paper for at-a-glance review. For example, Figure 2 shows a notional COI outreach meter that was developed to help service leads monitor whether they are appropriately engaging with the COIs relevant to their mission areas. These offerings must also support drill-downs to reveal supporting details that underlie the visualizations.

**FIGURE 2. Notional Visualization for a COI Outreach Metric**

	May 2006				Desired State
Summary	Appropriate engagement No relevant COIs	Appropriate engagement Few relevant COIs	Appropriate engagement Many relevant COIs	Appropriate engagement Most relevant COIs	Appropriate engagement All relevant COIs

### Putting It All Together

DoD’s overall net-centric transformation advocates implementing solutions in accordance with web-based service approaches (build once, use many). To implement the infrastructure for the metrics framework, DoD should collect potentially reusable metrics for posting to a shared space such as the DoD Metadata Registry (see [metadata.dod.mil](http://metadata.dod.mil)). DoD should commit resources to the development of metrics services built on these reusable parts. This approach makes economic sense, because it mitigates competing, duplicative solutions. It also helps ensure that metrics can be applied in an agile, adaptive fashion to a wide variety of assessment problems. Consistent with net-centric thinking, these metrics services should intelligently pull report data from relevant contributors rather than relying on manual data pushes from the stakeholders.

Providing building blocks for metrics definition, collection, integration, and visualization as enterprise services will help ensure that metrics can be used in consistent, meaningful ways to support decision making in the net-centric DoD. The proposed effects-based metrics framework provides a unifying, underlying basis for developing such services for broad, cross-enterprise use. An appropriate venue for developing such solutions is a joint, institutional metrics COI, in which the vocabulary, concepts, information exchange objects, and services relevant to metrics can be vetted, agreed upon, disseminated, and maintained for enterprise-wide use.

<sup>1</sup>Assistant Secretary of Defense for Networks and Information Integration/DoD Chief Information Officer, *Guidance for Implementing Net-Centric Data Sharing*, DoD 8320.02-G, April 2006.

<sup>2</sup>For more about EBO, see the Joint Warfighter Center’s Joint Doctrine Series. These pamphlets can be downloaded from the Joint Electronic Library at [www.dtic.doctrine/jwfc\\_pam.htm](http://www.dtic.doctrine/jwfc_pam.htm).

<sup>3</sup>DoD Chief Information Officer, *DoD Net-Centric Data Strategy*, March 2003.

### About the Author

Dr. Mary Ann Malloy is a lead information systems engineer for The MITRE Corporation. She is an internationally recognized expert in tactical messaging standards and information interoperability. Her research interests include XML technologies, business process/rules management and software reliability. Dr. Malloy supports net-centric interoperability initiatives for the Defense Information Systems Agency and U.S. Joint Forces Command. She chairs the Tidewater Research Council, a MITRE organization established to engage MITRE with local industry and academia in collaborative research. She has published more than 30 technical papers, most recently, *XML in the Wild Blue Yonder* and *Effects-Based Operational Metrics for the Decision-Making Warfighter*.

# Standardizing Air Force Base Networks around the Globe

By Jason Fields and Brennon Thomas



The effort required to standardize and optimize one computer network is challenging enough, but imagine doing it for more than 100 Air Force base and Major Command (MAJCOM) communications networks. Scope EDGE (Enterprise Design, Guidance and Evaluation), born out of Scope Network in July 2004, is fully engaged to standardize the Air Force network enterprise. Its core mission includes network compliance assessments, network optimization evaluations, rapid-response network crisis teams, and Air Force network enterprise health feedback. Based at Scott Air Force Base, IL, under the Air Force Communications Agency, it regularly deploys its people to every Air Force base and MAJCOM network operations center worldwide.

Scope EDGE operates using four- to six-person teams consisting of communications officers, government personnel, and contractors. Before an onsite visit to a base, the team performs a network compliance assessment remotely from Scott. During the remote assessment, Scope EDGE uses Air Force instructions and technical orders to rate the base's compliance. After completing the assessment, the Scope EDGE team travels to the base to conduct a network optimization, in which they assess the health of a base network and train base personnel on proper network operations. This two-tiered approach provides local commanders and MAJCOM leadership the detailed analysis to ensure that their networks are secure and ready to support the mission.

**Small scope EDGE teams of four to six personnel cover a broad array of functional specialities**



Due to the dynamic nature of the Air Force Global Information Gateway (AF-GIG), every Air Force base network operations center receives a Scope EDGE compliance assessment and optimization evaluation every 2 years. This busy schedule equates to approximately 60 trips each year. Scope EDGE also has a working relationship with the network operations and security centers at each MAJCOM and visits them up to twice a year to assist them with remote management of their bases. In addition to lending technical expertise, the Scope EDGE cadre take the opportunity to share best practices and trends with the various network operations centers, as well as with the network engineers residing at Scott. This important role has led to more efficient use of resources, rewriting of conflicting guidance, and increased standardization throughout the AF-GIG.

A Scope EDGE team chief explained the impact that the optimization portion of a trip has on the bases:

When a base has had a chronic issue or problem they cannot resolve, Scope EDGE offers an extra set of eyes to assist in diagnosing the problem and inching the network one step closer to optimization. Our benefit to the bases has been demonstrated over and over by Scope EDGE personnel and is echoed by commanders' comments and support.

Team members' technical specialties are varied and include infrastructure, operating systems and applications, information assurance, and network management. In the ever-changing world of information technology (IT), networking best practices

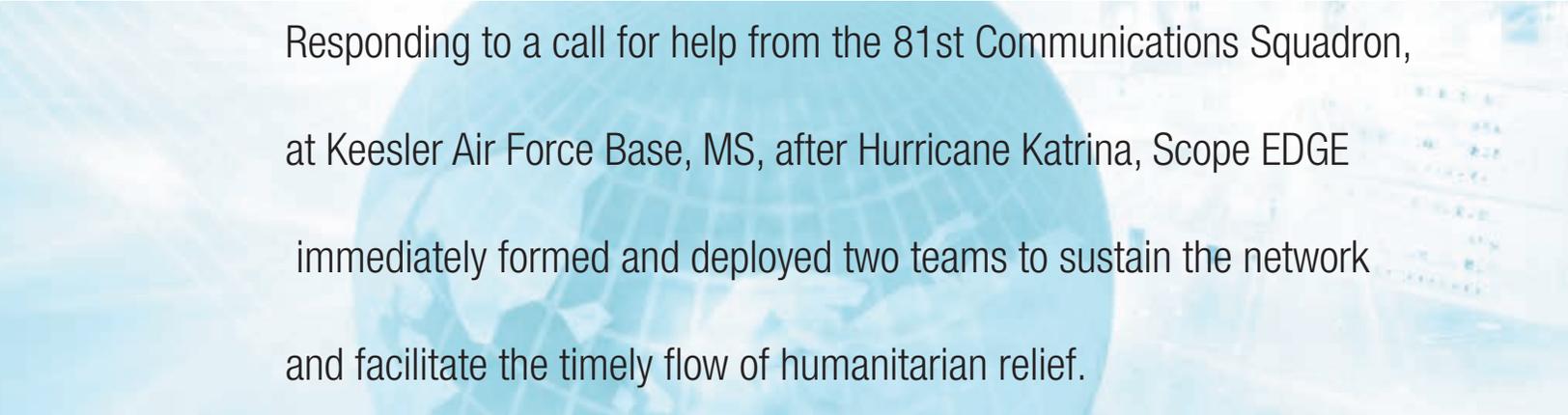
**A deployed Scope EDGE team of military, civilian, and contractor personnel takes a break from analyzing an Air Force network**



can change rapidly. Many team members maintain certifications from Microsoft, Cisco, and other vendors who keep them abreast of new information and trends in the IT field. This diverse skill set allows for significant analysis of the Air Force network and a wide variety of inputs that are beneficial to network operators, communications squadron leadership, and MAJCOM network authorities.

Scope EDGE sends personnel not only to every permanent Air Force base, but to deployed sites as well. In a deployed environment where mission requirements change rapidly, personnel rotations are high, and equipment reaches the end its life cycle, it is a more daunting task to standardize and optimize our warfighting networks. Using the same goals of network improvement and network operator training, Scope EDGE personnel visit various deployed locations every year. Recently, they found themselves in Qatar, Iraq, Afghanistan, and Kyrgyzstan. A Scope EDGE U.S. Central Command Air Forces (CENTAF) team chief described the process at deployed locations this way:

We work with the CENTAF network operations center to ensure that our deployments are of the greatest benefit to the deployed locations. Each team visits multiple locations over approximately six weeks and brings the local commander a way to solve network issues that warfighters may not have had time to address. We also provide the network operations center with insight into the issues and trends at all the Air Force deployed locations.



Responding to a call for help from the 81st Communications Squadron, at Keesler Air Force Base, MS, after Hurricane Katrina, Scope EDGE immediately formed and deployed two teams to sustain the network and facilitate the timely flow of humanitarian relief.

Compliance assessments and optimization evaluations are designed to improve base networks and, in turn, Air Force enterprise health, but they also serve another purpose. These trips allow team members to compile a high-level view of the operating networks and to hone their troubleshooting and network restoration skills. These top-of-the-line skills are often synergized to form Scope EDGE rapid response network crisis teams. Responding to a call for help from the 81st Commu-

nications Squadron, at Keesler Air Force Base, MS, after Hurricane Katrina, Scope EDGE immediately formed and deployed two teams to sustain the network and facilitate the timely flow of humanitarian relief. Putting both military and contractor network professionals at the site to support an infrastructure in trouble was all in a day's work for Scope EDGE. Another example highlighting the rapid response capability came recently during a trip to Korea. While on the ground at Osan Air Base, a Scope EDGE team was asked to look at a network servicing both U.S. and Republic of Korea forces. Applying their knowledge of Air Force networks, the team was able to provide standardization and optimization recommendations in less than a day. The Scope EDGE NORTEL contractor who was on the team remarked:

Our constant view into Air Force networks allows us to quickly troubleshoot and narrow the scope of networking issues. Even when handed a network we are unfamiliar with, our training and tools let us help the customer fix what is broken.

Now in its second 2-year cycle, Scope EDGE has shown resilience through Air Force networking transformations. Their relentless pursuit of network compliance and optimization guarantees one thing for the Air Force: a standardized IT infrastructure that enables the Air Force to fly and fight in cyberspace.

### **About the Authors**

Capt. Jason Fields has served over the past 18 months, in several positions, as Scope EDGE MAJCOM lead for the Air Force Reserve Command, Air Combat Command, and Pacific Air Forces. Formerly assigned to the 5th Combat Communications Group, Capt. Fields has been involved in network training, standardization, and optimization, both in garrison and in a deployed environment.

Brennon Thomas is the deputy team chief for the Air Combat Command team. His functional specialty is infrastructure, which includes collecting remote data, inspecting routers and switches, and analyzing networks for proper configurations and compliance.✱



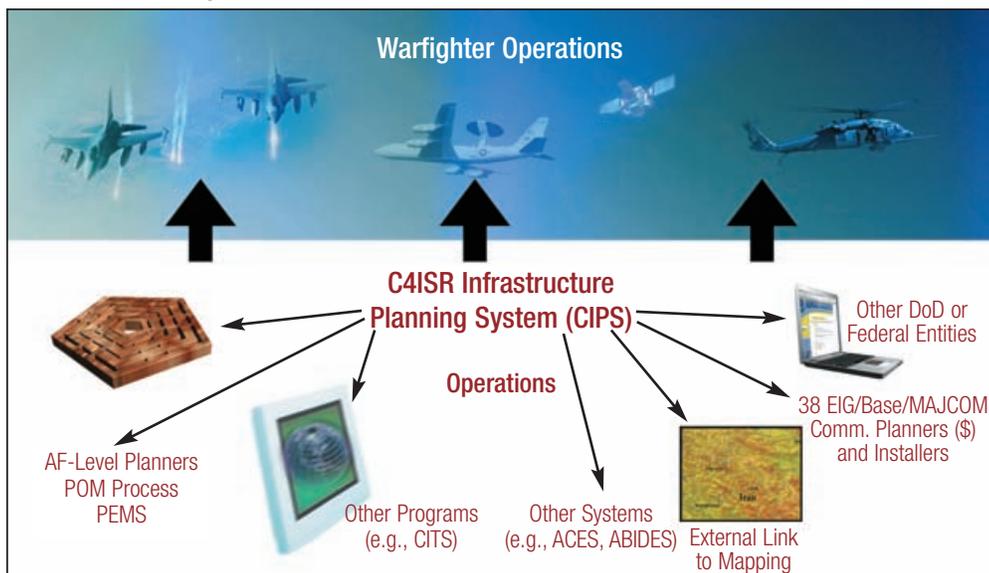
Electronic government is the initiative that has moved many Air Force IT applications to web-based platforms. Because of this initiative, many systems have been upgraded or completely redesigned to operate as interactive web-based tools. This is evident in the Air Force's communications arena. The web provides for quicker and more nimble communications for tracking information technology (IT) requirements and expenditures across the Air Force while, to some degree, leaving the user unable to take full advantage of the products offered.

The Clinger-Cohen Act provides guidelines for establishing policies for tracking IT requirements and expenditures. This has grown over the years into the need for a system capable of tracking both requirements and funds, while at the same time, providing a standardized toolset for input and management of data. Historically, IT requirements have been satisfied by numerous organizations identifying their needs and working independently to develop stove-piped solutions. Typically, the products developed in this manner do not provide an appropriate solution for all parties concerned. This is where CIPS—the Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Infrastructure Planning System—comes into play.

### C4ISR Infrastructure Planning System

CIPS provides a centralized database that allows real-time management of data related to the terrestrial communications infrastructure and related investment and sustainment requirements. This ensures that integrated, interoperable communications and data are available in support of the Air Force, Major Command (MAJCOM), and base missions. Figure 1 depicts the concept.

FIGURE 1. CIPS Operational View



The release of CIPS 3.0 satisfies the requirements of the Clinger-Cohen Act, while providing a redesigned and upgraded platform capable of satisfying customer requirements from the base level to the Air Staff level. It is now the standard within the Air Force for initiating and tracking requirements and for obtaining funding justification for long-range IT plans at Air Force sites around the globe.

CIPS 3.0 standardizes many IT business processes that have evolved over the years. CIPS has merged and refined these processes into one system that provides a repository of data that can be accessed by multiple levels of users and fosters real-time collaboration.

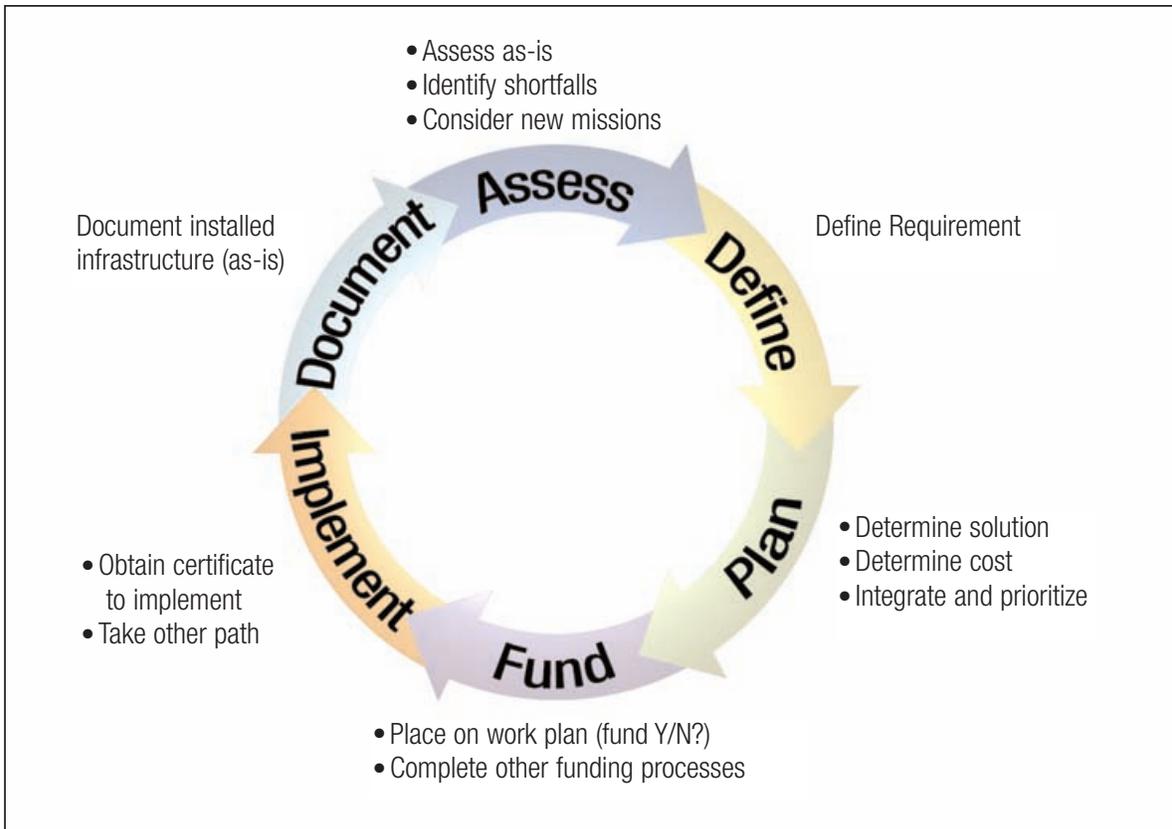
For the most part, Air Force IT requirements planning and implementation tracking systems are unique to MAJCOMs, specific locations, and communities of interest. Some exist at the Air Force level, but were designed around the needs of the financial community. MAJCOMs must provide similar reports to the Air Staff and financial councils, and no uniform approach exists across MAJCOMs to assist with ensuring that information is accurate, up to date, and consistent. Further, MAJCOMs and the Air Force as a whole are disadvantaged when competing with other programs and initiatives because of a lack of ability to justify IT requirements via a tie to mission and capabilities. Consequently, funds are lost, and the C4ISR infrastructure becomes older and less reliable, negatively affecting the warfighter.

The business processes built into CIPS, which are shown in Figure 2, will provide a consistent method within a web-based, data-centric environment to help ensure that the right communications requirements information gets to the right people at the right time. The system will encompass all levels of the communications planning and financial processing, and will enable a standard process across bases, MAJCOMs, and the financial offices beyond the Air Staff.

CIPS supports the Air Force Transformation initiative, which is defined as a process by which the military achieves and maintains an advantage through changes in operational concepts, organization, and technologies that significantly improve its warfighting capabilities or ability to meet the demands of a changing security environment.

CIPS allows for a system-of-systems view that will combine, relate, and integrate existing and future systems to eliminate duplicative efforts—in accordance with Air Force Instruction 33-108, “Compatibility, Interoperability, and Integration of Command, Control, Communications, and Computer (C4) Systems”—by providing as-is and to-be IT infrastructure views across the Air Force. These infrastructure views and IT data, known as C4I Blueprint data, are developed by planning engineers and

**FIGURE 2. C4ISR Requirement Life Cycle**



stored within CIPS for each Air Force location. This solidifies efforts for CIPS to be the “one-stop shop” for communications.

CIPS supports funding drills and requirements justification, and can be used to house and manage transformation efforts associated with Air Force Network Operations (AFNETOPS). This provides a combination of information, technology, and processes designed to enhance agile combat support and contribute to AFNETOPS implementation and sustainment by providing situational awareness for both garrison and deployed mission elements.

CIPS is designed to allow users a secure method to visualize their infrastructure in an intuitive, integrated, web-enabled manner that reduces time required to establish situational awareness and thereby helps achieve decision superiority.

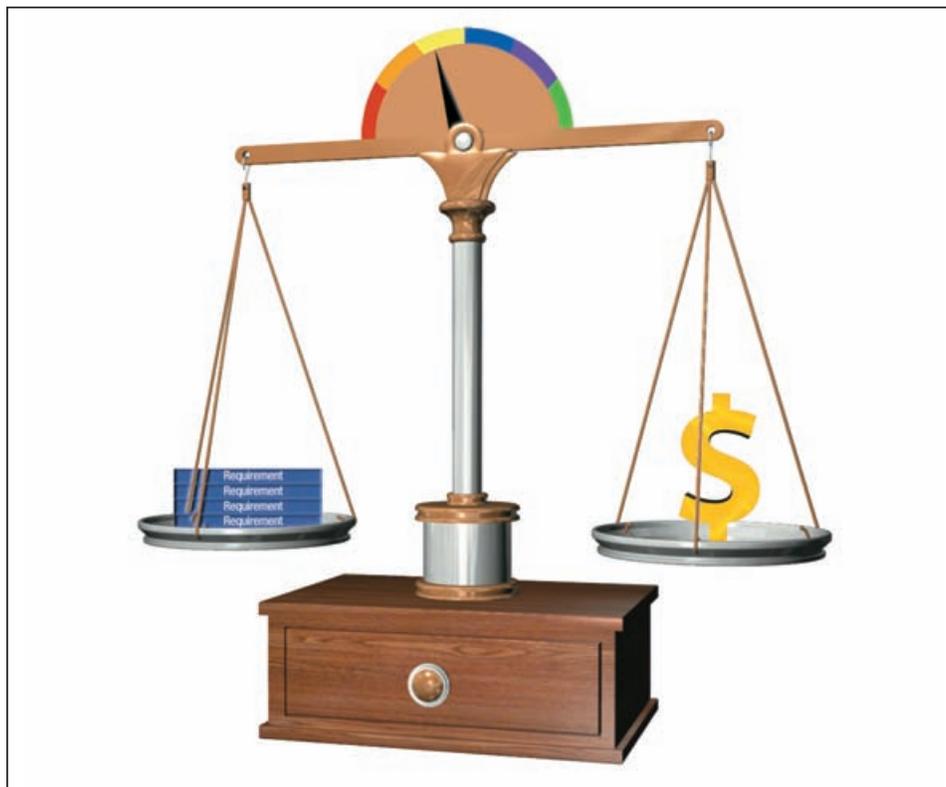
CIPS tools are process-oriented, enabling all users in the C4ISR planning process to collaborate seamlessly. CIPS exploits commercially available software and associated technologies to deliver a comprehensive, integrated capability for the Air Force to attain, maintain, and sustain one global information infrastructure supporting requirements ranging from the base level to the Air Staff level. Based on requirements generated through the Infostructure Technology Reference Model, the Constella-

tionNet Architecture, and AFNETOPS, CIPS serves as a tool for communications planning at all levels of the Air Force directly supporting Air Force C4ISR mission-essential tasks across the community. Organizations responsible for support of those tasks are, therefore, the customers—users—of CIPS.

### Communications Readiness Report Tool

With the release of CIPS 3.0 came the integrated Communications Readiness Report (CRR) tool. CRR provides a critical assessment of the as-is and to-be capability of the base IT systems to meet present and future requirements based on existing and proposed funding commitments. CRR also provides the ability to assess IT condition based on various funding scenarios. CRR had its inception as an Excel spreadsheet with one version of the spreadsheet tool for each MAJCOM. This was needed in order to meet the needs of all the Air Force MAJCOMs. It has since been redesigned and standardized across the Air Force to provide this capability in one place with one tool that allows for all users to have a standard database. The CRR uses CIPS C4I Blueprint data such as the Air Force infrastructure assessment analysis and transition strategy data (communications requirements line items), which include program element codes and related costs. The end result is that the user will be able to see the expected impact of the projected funding on the communications infrastructure, as shown in Figure 3.

**FIGURE 3. Projecting the Impact of Available Funding**



## **Future Growth of CIPS**

CIPS has been designed for growth that will provide for many tools to be added in future releases. As an example, the CIPS Visualization Component (CVC), which will be an additional feature, will allow GeoBase data to be stored and assessable within CIPS. CVC will provide the capability for the IT community (engineers, maintainers, operators, and leaders) to see a graphical depiction of base Air Force IT infrastructures to global positioning system accuracy and with aerial perspective to improve their situational awareness and decision-making processes. All of the Air Force GeoBase communications mission data set will be standardized into one system—something that has never been done before.

In the world of communications, providing modular and standard tools is paramount. CIPS is a system that was designed with the future in mind. As future releases to CIPS occurs, exciting new modular tools will be added that will provide users with new and updated processes.

### **About the Author**

Dwayne Gipson is a lead IT systems engineer at Tinker Air Force Base, OK. He has been employed there since 1994 as an electronics engineer and has held numerous positions ranging from project engineer to his current position.✱

# Keynote Address for 2007 Defense Standardization Symposium

The following is the keynote address presented by the Honorable Kenneth J. Krieg, Under Secretary of Defense (Acquisition, Technology and Logistics), at the Defense Standardization Program Conference held on March 13, 2007.

Thank you Jim [Hall, ADUSD (Logistics Plans and Studies) and Defense Standardization Executive] for the introduction and for inviting me here today.

Standards are an important and often unappreciated aspect of everyday life. We have standards for everything from electrical outlets to the emissions from our cars to athletics. Without standards, life would be pretty chaotic. I bring up sports because the most exciting discussion about standards, lately, has happened over the last two days—who did and did not make the field of 64 in the NCAA Men’s Basketball Tournament on Selection Sunday.

The Selection Committee uses a basic group of standards to judge all 336 NCAA Division I Men’s Basketball teams to measure who is worthy to play in the Tournament. The first and undisputed standard is if you are the winner of your conference championship, you receive an automatic bid to the Big Dance. This narrows the field down by 30.

To fill the remaining 34 slots, the selection committee looks at record, strength of schedule, the Ratings Percentage Index, and a team’s overall performance in recent games. While their measures are based on data, the committee is often subjective and inconsistent in their application. For some teams, the RPI is more im-



**Kenneth J. Krieg**  
Under Secretary of Defense  
(Acquisition, Technology and Logistics)

portant than their record, or their strength of schedule is more important than overall performance in recent games. I must admit, this year I can't complain, my two favorite basketball teams are in—Davidson and The Ohio State University. But, you have to wonder why was Drexel, one of the better mid major teams in the country, left out? You can't tell me compared to Stanford they were the lesser team. Drexel's RPI was higher, strength of schedule higher, record higher, but does beating UCLA at home towards the end of the season really make Stanford the better team? Let's not even expand this discussion to include Air Force and Florida State.

Now, I highlight this because it is a great example of how effective and ineffective application of standards can impact an organization. Let's face it with the play-in game being hours away, I know that 80 percent of you probably are thinking or will think at some point in time today about who to pick in your brackets. If you need some help, Davidson is a sleeper, sorry Terps fans, and the Buckeyes are legit.

The debate will continue until the end of time on whether Drexel was robbed of their shot at the title or not. Without a universal application of standards, we will never know the answer, and year after year this debate will continue. This may make sports interesting, think about the impact to the economy of removing this ineffective standard structure. How many sportswriters would be out of a job, not to mention countless bar tabs not accumulated for lack of debate. However, while it is great for sports, it is not good practice for most organizations, especially for the Department of Defense.

At the Department, universal standards affect our readiness, interoperability, and most importantly, they

affect the capabilities of our warfighter. Without standards, we jeopardize the mission and ultimately the lives of our men and women who wear the uniform. It is our duty in the AT&L community to provide our warriors with the BEST systems and support in the world. We cannot do that if we do not adequately apply standards across the enterprise for programs, systems and support.

Standardization enables the business strategies the Department has set for a more flexible, sustainable, and interoperable force that are necessary to succeed in a wide range of missions, including conventional and unconventional warfare and activities far short of warfare. Standards provide the framework for achieving Service and allied interoperability, for reducing our logistics footprint, for testing and documenting advances in science and technology, and for supporting the U.S. industrial base.

It's important for you in the Defense Standardization Program to understand that a number of the goals that our senior leadership group and myself have put together for the AT&L support the priority of standardization. I will not go through all seven of them with you today, but I encourage you to go to the AT&L website and read them. Each of you plays an important role in the success of our organization meeting the need of the joint warfighter. Through the Implementation Plan you can see the roles that various organizations and you play in meeting these goals. But I do want to touch on several of them.

One of our goals is Strategic and Tactical Acquisition Excellence. Here, we distinguish between "Big A"—what we decide to buy at the strategic level—and "little a"—how we develop, test, produce and sustain individual weapon systems at the tactical level. It

is critical to the warfighter that the systems we acquire work reliably with the intended results in all environments and operational situations. To achieve this, it is essential that we have standards in place to validate how well our equipment performs.

It is extremely important that we take standard parts into consideration early in the acquisition process for a program. Not only will it improve life-cycle costs, but it will also make our system easier to sustain over the long term. As Jim noted, for example, the Navy's Seawolf submarine was anything but standard. Over 105,000 parts were used in its construction, many of which were unique, expensive, and logistically difficult to support. By contrast, the Virginia Class submarine at time of the contract award has just under 15,000 parts, most of which were standard. Standards not only reduce costs during construction but throughout the entire life cycle of a program. The Navy estimates that there will be a cost avoidance of \$789 million over the life of the program.

Standardization can also be a tremendous force multiplier and the results are that the overall efficiency of combined forces will be greater than the sum of individual components. This is why in 2005, the Joint Chiefs of Staff revised their Joint Capabilities Integration and Development System instruction and manual to require consideration of U.S.-ratified international standardization agreements when developing joint capabilities documentation.

For example, our most recent aircraft development effort, the Joint Strike Fighter, is using standardization to achieve affordability and interoperability. Though the Joint Strike Fighter will come in three variants, there will be 70 to 80 percent commonality among its subsystems, equipments, materials, fabrication

processes, and assembly tooling. In addition, the Joint Strike Fighter will rely on a wide variety of existing standards to control costs and enhance interoperability.

The Joint Strike Fighter program, however, is not just a user of standards, but an innovator of standards. Last year, the Joint Strike Fighter Weapons Integration Team along with the Defense Standardization Program received an Outstanding Achievement Award for their development of a Joint Service Store Certification Guide that significantly reduced unique weapon requirements and standardized on such things as common bomb and fuzing systems. This team's standardization efforts will result in a cost avoidance of nearly \$1.2 billion over the life of the program.

By effectively using standards, we are also achieving another goal for AT&L: Cost-Effective Joint Logistics Support for the Warfighter. We are moving from logistics as necessary toward "supply chain as offense," which intimately ties our logisticians to the warfighter. End-to-end supply chains must be built on customer success, based on common data—and common data is only possible if you have common standards—enabled by transparent business systems.

Done well, this system will increase performance, improve productivity, and reduce wait times, inventory and total cost to the enterprise. By reducing our logistics footprint, we will be able to support our systems, equipment and the warfighter more efficiently.

We are building on our partnership with industry, and we are leveraging their best practices as we apply standards. The use of private sector standards is an area where the Department has historically been strong with the adoption of over 9,000 such standards to date. It is also an area where the Department has

shown leadership in those technologies vital to the defense mission. An example of this is the Department's involvement in the development of private sector standards for unmanned systems.

We are making significant progress instituting standards for the Department, but many challenges remain. The biggest challenge is not in the development of standards but their use. For the warfighter to receive maximum benefit from standardization, we cannot apply standards here and not there. They must be mandatory across the enterprise.

We are trying to integrate standardization considerations and trade-offs in the beginning of acquisition processes. We are placing a greater emphasis on standards during program reviews. Those are two parts of change underway.

The Materiel Readiness Senior Steering Group is also supporting standards and emphasizing their use for parts management in every program.

We need to work horizontally across traditional boundaries if we are to establish common standards for the Department. Without standards, military operations could not be successful. Future missions will require us, I believe, to place a greater emphasis on

standards. I look forward to working with you closely to ensure we are meeting our warfighters needs. We have the opportunity and the ability to institute effective standards for the Department, and we must. This is admittedly difficult in a culture that focuses on optimizing the specific platform rather than the overall supply chain.

But today we are here not only to discuss standards and their unquestionable importance to the Department and our missions, we are also here to recognize and celebrate the individuals in this room who have made an enormous impact on achieving our standards goals.

I would like thank all of you for your efforts. Without you, the Department would not be as successful as we are today. You are an integral part of our overall missions. Your work directly impacts our warfighter, and their success is a result of your work. You should be proud of everything that you do to help us achieve our mission. I am very proud of you; this is not easy work. I want to thank you for your hard work and dedication.

I appreciate your attention today. I would be happy to take any questions now.

# Defense Standardization Program Awards

**O**n March 13, 2007, **Mr. Kenneth Krieg**, the Under Secretary of Defense (Acquisition, Technology and Logistics), **Mr. James Hall**, the Assistant Deputy Under Secretary of Defense (Logistics Plans and Studies), and **Mr. Gregory Saunders**, Director, Defense Standardization Program Office, presented six awards for outstanding performance in implementing the Defense Standardization Program. Two individuals and four teams were honored. Their standardization efforts have made singular improvements in technical performance, greatly enhanced safety for DoD personnel, and avoided billions of dollars in costs.



## 2006 DISTINGUISHED ACHIEVEMENT AWARD WINNER

The 2006 Distinguished Achievement Award, which includes an engraved crystal Pentagon and a \$5,000 check, went to **Mr. James Colson**. As co-chair of a government-industry committee, Mr. Colson led the effort to gain agreement on and finalize a Government Electronics and Information Association standard, GEIA 927, that melds the data concepts of diverse functional areas into one related entity. The standard merges the data concepts of DoD's Standard for the Exchange of Product Model Data and various logistics data standards. Through Mr. Colson's efforts, programs can develop an integrated digital environment that employs formal methods and automation to support the full range of data manipulation and communication required by complex system life-cycle activities. Use of GEIA 927 will allow programs to achieve an unprecedented degree of interoperability among information technology and database systems for complex engineer-to-order systems, products, and processes over their life cycle. Success will result in a lean, more affordable operating mode for all stakeholders in the design, development, manufacture, fielding, and support of modern complex systems.



Pictured above are Mr. Greg Saunders, DSPO Director, and Mr. Kenneth Krieg, Under Secretary of Defense (Acquisition, Technology and Logistics), presenting the award check to Mr. James Colson, leader of the government-industry committee that finalized a new standard, GEIA 927.

## ACHIEVEMENT AWARD WINNERS



Pictured above are, left to right, Mr. Jim Knowles (hidden); Mr. Kenneth Krieg; Mr. Russell Fiscella, Award Winner; Mr. Ralph Favale, Award Winner; Mr. James Rutkowski, Award Winner; Mr. James Bendick, Award Winner; Mr. Douglas Brown, Award Winner; Mr. Ron Davis, Army Standardization Executive; and Mr. Jim Hall, Assistant Deputy Under Secretary of Defense (Logistics Plans and Studies).

An Army team led the effort to update the Joint Ballistics Memorandum of Understanding (JBMOU), the de facto international standard for development of 155mm howitzers and ammunition. The payoff for the United States, Great Britain, Italy, Germany, and France is to improve operational effectiveness by having the ability to exchange ammunition during combat. The ballistic properties—internal pressures, muzzle velocity, range, and accuracy—of JBMOU-compliant ammunition will be the same when fired from any JBMOU-compliant cannon. This level of interoperability is a powerful force multiplier. Furthermore, interchangeability allows partner nations to transport, store, handle, and distribute common ammunitions, improving readiness and reducing the logistics footprint throughout the supply chain.

**Team members: Mr. Russell Fiscella, Mr. Ralph Favale, Mr. James Rutkowski, Mr. James Bendick, and Mr. Douglas Brown**

## ACHIEVEMENT AWARD WINNERS



Pictured above are, left to right, Mr. Kenneth Krieg; Mr. Ed Seamans, Award Winner; Ms. Cecilia Black, Award Winner; Mr. Dave Seliga, Award Winner; Mr. Billie Thomas, Award Winner; Mr. Steve Haught, Award Winner; Mr. Ron Davis; and Mr. Jim Knowles, Interim Army Deputy Standardization Officer.

An Army team undertook the challenge of developing the Common Army Air Defense Interrogator—a state-of-the-art system to differentiate between friendly and enemy aerial platforms—that satisfies commonality requirements and is backward compatible with existing systems. The team worked closely with the various air defense program managers, reviewed equipment specifications and integrated logistics support maintenance strategies, and prepared the equipment specification and procurement documentation. They also participated in the development of a tri-service specification and a NATO standardization agreement to ensure interoperability with NATO and coalition partners. Implementing the new system will avoid an estimated \$31 million in costs.

**Team members: Mr. Steve Haught, Mr. Billie Thomas, Mr. Dave Seliga, Ms. Cecilia Black, and Mr. Ed Seamans**

## ACHIEVEMENT AWARD WINNERS



Pictured above are, left to right, Mr. Kenneth Krieg; Mr. Steven Makieil, Award Winner; Ms. Donna Morse-Eaves, Award Winner; CAPT Neil Stubbits, Commanding Officer, Indian Head Division; Mr. Arthur Stanton, Supervisor, Program Management Division, NSWC Indian Head; Mr. Jerry LaCamera, Technical Operations Manager, Indian Head Division; Mr. Jeff Allan, Navy Deputy Standardization Officer; Mr. Nick Kunesh, Navy Standardization Executive; and Mr. Jim Hall.

A Navy team launched an initiative to standardize and modernize the inventory of general-purpose electronic test equipment. Now, instead of maintaining 312 different models of oscilloscopes and digital multimeters, the Navy has just 34 models across both families. These standardization efforts will save the fleet \$6.1 million in reduced maintenance costs. The overall savings from the reduction of the logistics tail and the decrease in calibration intervals from once a year to once every 3 years is projected to save \$45.3 million across the Future Years Defense Program.

**Team members: Mr. Ed Chergoski, Mr. Steven Makieil,  
and Ms. Donna Morse-Eaves**



Pictured above are, left to right, Mr. Kenneth Krieg; Dr. Jon Klauenberg, Award Winner; Col Thurmon Deloney, Chief, Air Force Engineering Policy and Guidance; Mr. John Heliotis, Air Force Departmental Standardization Officer; Mr. Gerry Friesthler, Director, Engineering Directorate, Aeronautical Systems Center, Wright Patterson AFB; and Mr. Jim Hall.

## ACHIEVEMENT AWARD WINNERS

**Dr. B. Jon Klauenberg** initiated and successfully gained Defense Standardization Program approval for establishing a new standardization area, Radiofrequency Exposure to Personnel Safety. His diligent efforts and international team leadership resulted in two major revisions of NATO standardization agreement (STANAG) 2345 consistent with non-government standardization activities while incorporating military-unique concepts and applications. His efforts ensured that radiofrequency standards would not have adverse impacts on DoD operations due to overly restrictive limits. As a result of his efforts, Dr. Klauenberg was appointed custodian of STANAG 2345, ensuring continued DoD leadership in this vital area of standardization.



Pictured above are, left to right, Ms. Elizabeth Jones, Award Winner; Mr. Mike Williams; Mr. Lee Kashka, Award Winner; Mr. Oren Edwards, Award Winner; Mr. Kenneth Krieg; Ms. Katherine Hodges; Ms. Kristina Paige, Award Winner; Ms. Nadine Thomas, Award Winner; Mr. Jerry Duke; Col Thurmon Deloney; Mr. John Heliotis; and Mr. Gerry Friesthler.

An Air Force team worked to standardize the data interface between aircraft and weapons to enable the rapid deployment of precision-guided munitions. Through this program, weapons can be integrated without changing the aircraft Operational Flight Program. Development of a universal interface between aircraft and weapons transforms the armament integration process from a program-centric approach to a capabilities-based process. It also accelerates the fielding of new state-of-the-art weapons by 1 to 3 years and reduces weapon integration costs by up to 40 percent.

**Team members: Ms. Nadine Thomas, Ms. Elizabeth Jones, Mr. Oren Edwards, Mr. Lee Kashka, and Ms. Kristina Paige**

**July 10–12, 2007, Chantilly, VA**  
*Course on Standardization within  
NATO (U.S.-Based Track)*

On July 10–12, 2007, the International Cooperation Office, Defense Standardization Program Office, and North Atlantic Treaty Organization Standardization Agency will host the first course in the United States on Standardization within NATO. This course is designed to present an overview of domestic and international standardization practices within the United States as they relate to interoperability with allies and partners. Thus, the course is intended for military, DoD civilian, and federal government personnel who have little knowledge of international standardization or knowledge in distinct areas but have never taken the Standardization within NATO course. Non-DoD federal government employees and defense contractors who are involved in NATO standardization and interoperability activities are also eligible for this course depending on space availability.

Seats are limited, and going fast. If you're interested in attending this course, please contact Latasha Beckman at [latasha.beckman@dla.mil](mailto:latasha.beckman@dla.mil).

**August 20–21, 2007,  
San Francisco, CA**  
*56th Annual SES Conference/  
12th International IFAN Conference*

The Standards Engineering Society will hold its 2007 annual conference in conjunction with the 12th international conference of the International Federation of Standards Users. Join us for an informative and lively conference featuring representatives from around the world to discuss global standards issues. For more information, go to [www.ses-standards.org](http://www.ses-standards.org) or e-mail [admin@ses-standards.org](mailto:admin@ses-standards.org).

**World Standards Day Paper  
Competition**

Standards play a vital role in the world, so the theme for the World Standards Day 2007 paper competition is “Standards and the Global Village.” In our diverse world, global consensus is difficult to reach despite the move to globalization of trade and culture. But for many decades, standards have led to international consensus on critical issues, including consumer information and protection, product and service quality and safety, environmental regulation, health care, security, Internet protocols, and fair trade. This theme recognizes the global consensus-building capacity of standards-developing organizations.

The competition invites papers that show, using specific examples, ways that standards-developing organizations have encouraged and created global consensus for the economic and social benefit of the global village. The Standards Engineering Society (SES) and World Standards Day Planning Committee will award cash prizes for the three best papers submitted. The first-place winner will receive \$2,500 and a plaque, and the second- and third-place winners will receive \$1,000 and \$500, respectively, along with a certificate. In addition, the winning papers will be published in SES's journal, *Standards Engineering*, and the paper winning first place will also appear as a special article in *ANSI Reporter*, a publication of the American National Standards Institute.

Contest papers, along with an official entry form, should be sent to the SES Executive Director, 13340 SW 96th Avenue, Miami, FL 33176. To be eligible, the papers must be received by midnight, August 31, 2007. For more information, go to [www.ses-standards.org](http://www.ses-standards.org) and click 2007 WSD Paper Competition. Winners will be announced and given their awards at the U.S. Celebration of World Standards Day, held this year on October 18 at the Ronald Reagan Building and International Trade Center in Washington, DC.

### **October 18, 2007, Washington, DC** ***U.S. Celebration of World Standards Day 2007***

On October 18, 2007, leaders in business, industry, academia, and government will gather in Washington, DC, to join with consumer representatives and experts in science and technology for a celebration of the relationship between standards and the well-being of citizens in every corner of the world.

From air quality to children's toys and from alternative sources of energy to security and privacy on the Internet, standards and conformity assessment programs have helped bolster social progress and stimulate worldwide economic development. To acknowledge the significance of standards in society and on the economy, the theme of the U.S. Celebration of World Standards Day 2007 is "Standards and the Global Village." The 2007 observance of World Standards Day will be held on Thursday, October 18, 2007, at the Ronald Reagan Building and International Trade Center in Washington, DC. The event will include a reception, exhibits, dinner, and presentation of the Ronald H. Brown Standards Leadership Award. The administrating organization for this year's event is the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. For more information, please go to [www.wsd-us.org](http://www.wsd-us.org).

### **Welcome**

**Robert Heber** returned to the DoD Standardization Program in March 2007 as the team chief of the Microelectronics Team at the Defense Supply Center Columbus (DSCC). He is responsible for developing, revising, and managing standardization documents on hybrid microelectronics, the test standard MIL-STD-883, and Standard Microcircuit Drawings. This team was formerly led by Raymond Monnin, who retired in December 2006. Mr. Heber was the team chief of the DSCC's Interconnection Team from September 1996 to February 2003. For the last 4 years, he has been a team chief in the Maritime Group at DSCC. Welcome back.

### **Award**

**John (Jack) Cole**, an IT specialist in the Army Research Laboratory's Center for Intrusion Monitoring and Protection, has been selected as the 2006 recipient of the IEEE Computer Society Hans Karlsson Award. The award recognizes "outstanding skills and dedication to diplomacy, team facilitation and joint achievement, in the development or promotion of standards in the computer industry where individual aspirations, corporate competition, and organizational rivalry could otherwise be counter to the benefit of society." The award was presented in Los Angeles on Wednesday, May 16, at the IEEE Computer Society President's Award Banquet.

### **Farewell**

In March 2007, **Richard Taylor** left the Document Standardization Unit at DSCC for a job in the Occupational Safety and Health Administration in Cincinnati, OH. Mr. Taylor was the chief of the Interconnection Team at DSCC and was responsible for preparing specifications for standardization documents on electrical connectors, wire and cable, and hydraulic hoses and fittings. We wish him well in his new job assignment.

### **Passing**

**John M. (Jack) Kerr**, 83, a native Washingtonian, died of a stroke on April 1, 2007, at his summer home in King George, VA. Mr. Kerr, who also lived in Fairfax, attended the University of Virginia before serving during World War II as an Army military policeman in Europe. He spent 35 years as an engineer with the Department of the Navy before retiring in 1984. Many in the Defense Standardization Program will remember Mr. Kerr as a developer of defense specifications and standards for connectors, printed wiring boards, and other electrical components.

# 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
July–September 2007	DHS Standardization
October–December 2007	Parts Management

If you have ideas for articles or want more information, contact Tim Koczanski, Editor, *DSP Journal*, J-307, Defense Standardization Program Office, 8725 John J. Kingman Road, Stop 6233, Fort Belvoir, VA 22060-6221 or e-mail [DSP-Editor@dla.mil](mailto: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.

