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The Business of Metrics— Measuring the Product of the Plan



Rear Adm. Dave Antanitus, USN

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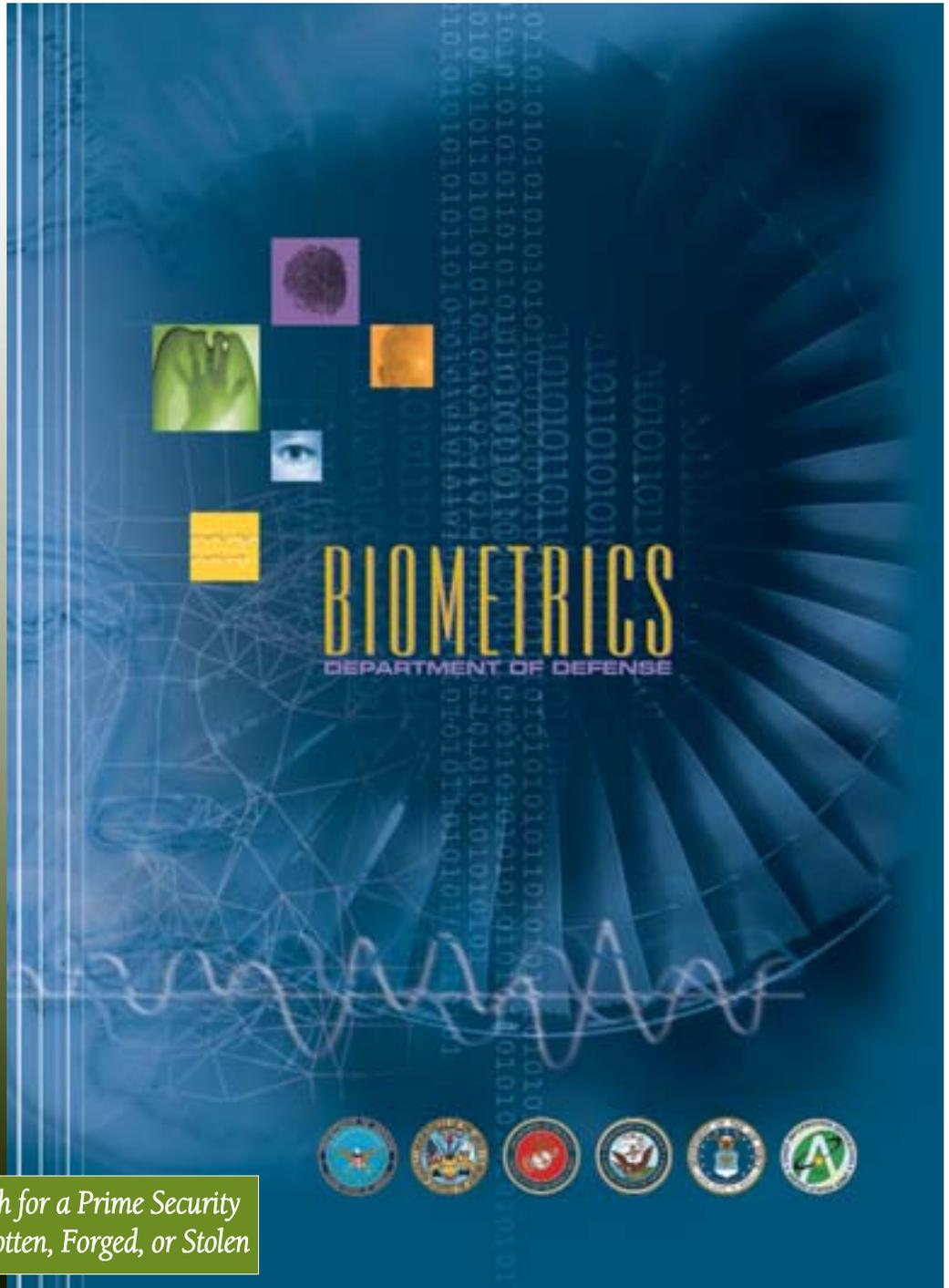
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**SECURITY SUPPORT TO
ACQUISITION OF WEAPONS
SYSTEMS**

**POWER ELECTRONICS
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MODERN ACQUISITION MYTHS

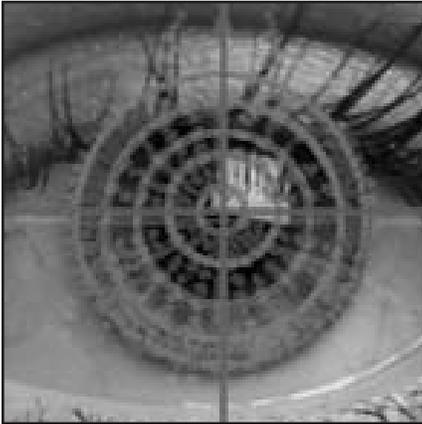
DoD Biometrics Program—Search for a Prime Security Enabler that Cannot be Lost, Forgotten, Forged, or Stolen



PROGRAM MANAGER

Vol XXXII, No.2, DAU 173

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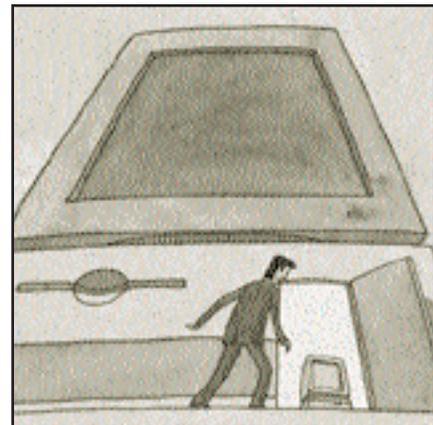


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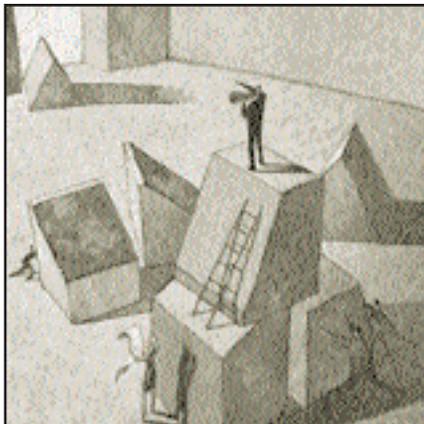
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Strengthening DoD's Identity Assurance Through an Enterprise-Wide Biometrics Solution

Biometrics—A Prime Security Enabler that Cannot be Lost, Forgotten, Forged, or Stolen

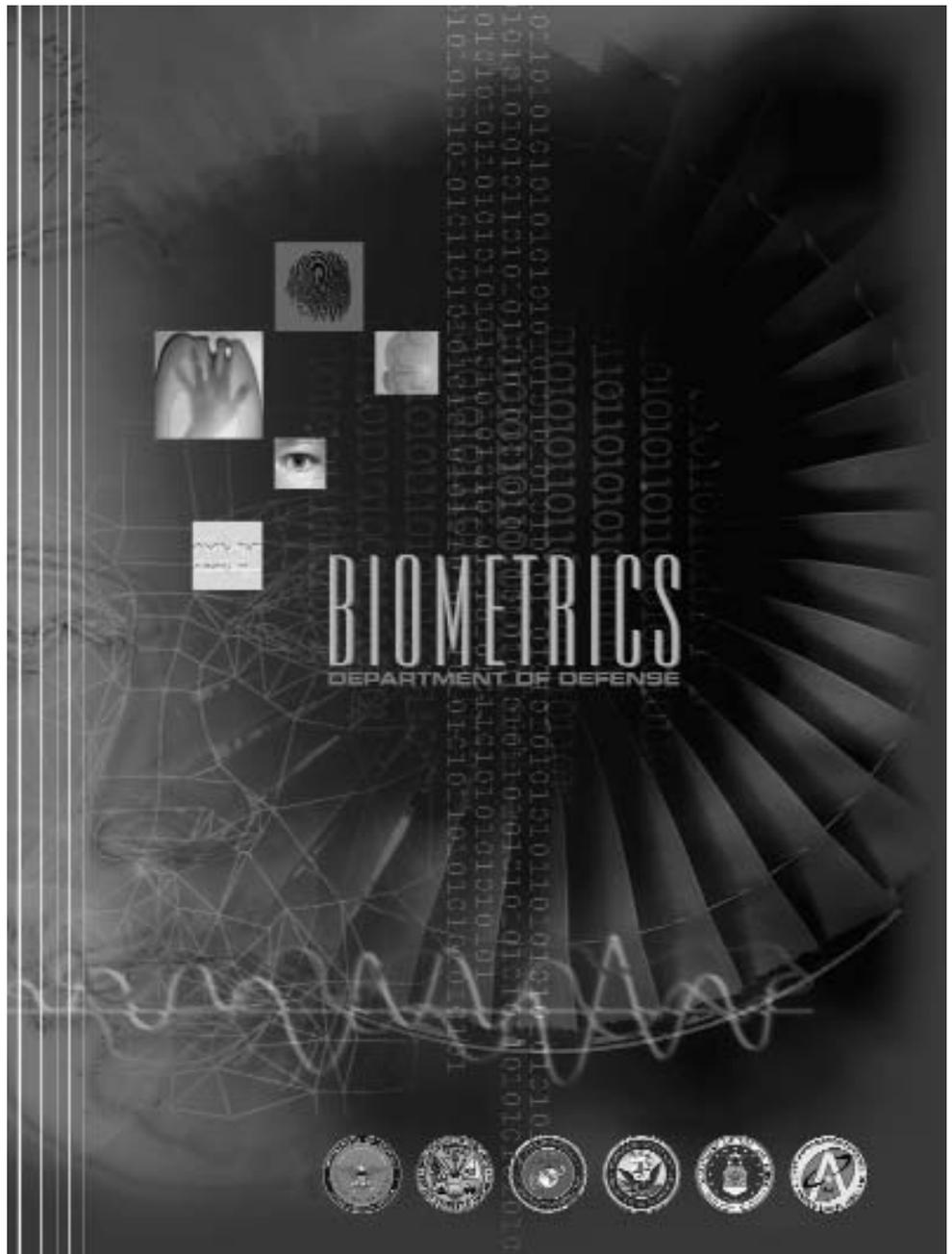
DR. LINDA DEAN • MAJ. STEPHEN FERRELL, USA • LYDIA KAIZER

Imagine what it might be like for DoD employees, even when transferring from one area to another, to be able to easily access their computers and workplaces with the touch of a finger to a platen device, or by glancing into an iris scanner. Imagine, more importantly, what it might be like for the DoD to know that users are able to access only the facilities and information to which they have been granted authority.

Traditional Forms of Identification Fall Short

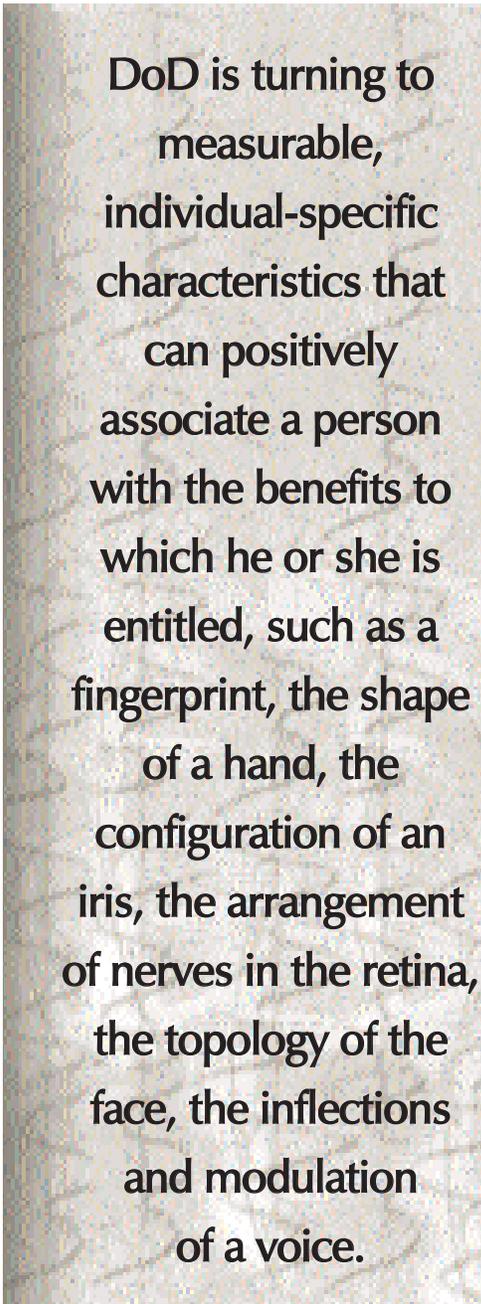
The challenge to achieving such an end-state is easily stated: how does the DoD guarantee—at any given time, in any given location—that a person claiming authority to access valuable internal assets is actually the person to whom such authority has been granted? Recent events have made it clear that something in addition to the traditional forms of identification—photo IDs, Personal Identification Numbers (PINs) and passwords—might be necessary to meet this challenge. A tool is needed that cannot be lost or forgotten, forged or stolen; that can guarantee the identity, or verify the claimed identity, of an individual; that can ensure that the right person with the right privileges has timely access to secure systems and facilities

Dean is Director of the DoD Biometrics Management Office (BMO), located in Arlington, Va. Her full bio appears on p. 5 of this article. Ferrell is Director, Biometrics Fusion Center, BMO; and Kaizer is with Booz, Allen & Hamilton, providing policy contract support to the BMO.



across the DoD enterprise; and that can positively link an individual with certain activities or events.

To achieve these levels of identity assurance, the DoD is turning to measurable, individual-specific characteristics that can positively associate a person with the benefits—including facility and network access—to which he or she is entitled. These characteristics are referred to as biometrics. They include certain physical patterns and geometries that are unique to each human being: a fingerprint, the shape of a hand, the con-



DoD is turning to measurable, individual-specific characteristics that can positively associate a person with the benefits to which he or she is entitled, such as a fingerprint, the shape of a hand, the configuration of an iris, the arrangement of nerves in the retina, the topology of the face, the inflections and modulation of a voice.

figuration of an iris, the arrangement of nerves in the retina, the topology of the face, the inflections and modulation of a voice.

Each of these and other individual-specific identifiers can be captured, measured, converted to a mathematical algorithm, and recorded for future use. Moreover, because they represent who you are, instead of what you know (a PIN or password) or what you possess (a token or key), each has the potential to allow for guaranteed identity assurance. That, in turn, translates to guaranteed security of the DoD's physical and information assets.

The DoD is no stranger to biometric technologies; the Department has been using these technologies to manage access to chemical demilitarization projects for many years. More recently, the Department has begun using iris scan and fingerprint technologies to manage physical access to restricted properties and logical access to critical computers and networks.

Looking to the future, the DoD is investing heavily in the research, development, and evaluation of emerging biometric technologies, including facial recognition, hand geometry, signature verification, and voice recognition, to determine their operational viability. A list of qualified devices, however, is only half the equation. The question remains: how do you make each device functional within an enterprise as massive, multifaceted and geographically dispersed as the DoD?

The DoD Biometrics Management Office

In 2000, the United States Congress directed the Secretary of the Army to act as Executive Agent in leading, consolidating, and coordinating all biometrics information assurance programs for the DoD. To accomplish this mission, the Army created a DoD Biometrics Management Office (BMO). The mission of the BMO is to ensure that biometrics technologies are integrated effectively into information assurance programs, physical access control systems, and best

business practices across the DoD. This mission entails two clearly defined objectives: 1) to test and evaluate currently available biometrics products for DoD applications; and 2) to develop an enterprise solution to facilitate the use of biometrics across the DoD.

Device Testing

The BMO maintains two criteria for selecting the biometric devices that it evaluates.

COTS Product

First, the device must be a Commercial-Off-the-Shelf (COTS) product. Through close working relationships with research and development organizations such as the Defense Advanced Research Projects Agency (DARPA), the BMO keeps informed of cutting-edge technology developments in the biometrics arena. Its mandate, however, is to build a solution that will satisfy current DoD requirements.

Interoperability

Second, the BMO considers only those devices that have the potential to integrate into a large, enterprise-wide solution. Interoperability is critical. Once these prerequisites are satisfied, the Biometrics Fusion Center (BFC), located in West Virginia, steps in to perform comprehensive testing.

There are three phases to the BFC's product testing process.

Product Assessment Phase

All devices claim certain levels of technical performance. The BFC's Product Assessment phase determines to what degree those claims are valid, and whether or not they meet certain DoD-determined minimum performance standards.

Controlled Environment Testing

The second phase of the evaluation process, Controlled Environment Testing, introduces each device to a set of conditions intended to determine if an item—in addition to being technically viable—can remain technically viable in various DoD operational environments. Devices are subjected to extremes

of illumination, temperature, humidity, physical stress, operational repetition, particulate contamination, and electronic and magnetic interference. The data collected from these evaluations allow the BFC to match device capabilities with specific DoD operational requirements.

Field Testing

Those devices that meet one or more DoD operational requirements are graduated to the final phase of the evaluation process. Field Testing involves physical deployment of selected devices to the operational environments in which they will have to function. Their performance during this phase will establish the military applications for which they will be appropriate, and the level of security that they will be able to provide within each application.

The result of these testing activities will be a DoD Biometrics Product List. This is the list from which DoD executives and commanders will select biometric devices that meet their specific identity assurance requirements.

Enterprise Solution Development

The BMO plans to reach Full Operational Capability (FOC) of its biometrics enterprise solution by the second quarter of fiscal 2005. The devices, systems, network architecture, and business processes that comprise this solution will allow for worldwide deployment of biometric identification devices to safeguard access to DoD facilities and information.

The goal of this development initiative is summarized in a phrase coined early on by the BMO: *one enrollment, multiple uses*. The idea is to provide the DoD with the ability to: 1) rapidly, accurately, and securely authenticate personal identity based upon one or more of an individual's biometric characteristics; and 2) to exchange that individual's biometric credentials between authorized entities in a secure and trustworthy fashion.

Once fully operational, the DoD's biometrics solution may be used as a stand-alone access security tool or—especially

in those instances when the facility or network in question is of particular importance—it may become part of a layered solution, serving in concert with other, more traditional forms of identification.

The DoD Biometrics Senior Coordinating Group

To ensure that the security requirements of the various Agencies, Departments, and Services within the DoD are adequately represented as the BMO proceeds with evaluating biometric devices and with building a biometrics enterprise solution, the Army, acting as executive agent, also has formed a DoD Biometrics Senior Coordinating Group (BSCG). Similar in function to a board of directors, this group is composed of senior military and civilian executives across the DoD.

Its mission is to provide strategic guidance to the DoD BMO on the development, evaluation, and implementation of biometrics enterprise solutions; and to serve as the DoD-wide coordinating group for biometrics issues. This mission entails, among other things, the development and implementation of policy, and the promotion of selected technical and business process standards.

Policy

In order for the DoD to successfully deploy a biometrics enterprise solution, policy must be created and implemented to allow for and manage the use of this solution. The BSCG endorses and provides advocacy for policy governing the collection, storage, retrieval, and use of biometric data within DoD. This provides the needed horsepower to implement those plans, and provides the DoD biometrics end-users with the guidance they need to best employ these new technologies for security or business process improvement.

Standards

As information and resource sharing becomes an ever-increasing priority across all government departments, the BSCG recommends and promotes the use of federal, national, and international stan-

dards or common commercial practices for biometrics. This maximizes interoperability between biometrics applications, helping the biometrics industry meet DoD technology requirements in an efficient manner. By reducing the adoption of technologies that cannot interact with other systems of similar purpose but different architectures, this interaction between industry and government is a benefit to taxpayers as well.

Building the Component Pieces

The BMO has identified four stages in the life of a biometric:

- Collection
- Storage
- Access and Retrieval
- Use

Each of these stages, or functional areas, poses a unique set of requirements that must be satisfied individually, but must also work within the larger context of an integrated solution. For each functional area, there are five phases to the development process:

- Design
- Build
- Test
- Field
- Integrate

The final phase, integration, involves the incorporation of the solutions developed within each functional area (Collection, Storage, Access and Retrieval, and Use) into a unified architectural whole. To create best-of-breed solution sets for each area, the BMO has created four Enterprise Working Groups (EWGs) to identify requirements and design and implement Technology Demonstrations (TDs).

The Collection Enterprise Working Group

This EWG is responsible for researching and recommending the best biometrics collection system configurations to become part of the enterprise solution's operational, systems, and standards architectures. To ensure scalability, this group will focus primarily on

DR. LINDA S. DEAN

DoD BIOMETRICS MANAGEMENT OFFICE

Office of the Secretary of the Army
Corporate Information Office/G6

Dr. Linda S. Dean became the Director, DoD Biometrics Management Office on Aug. 1, 2002. As the Director, Dean is currently overseeing the development of DoD biometric policies and enterprise solutions for physical and logical access uses crossing all functional areas including finance, logistics, personnel, acquisition, information management, and medical.



Program (CEAP), and the Army's Super Computer Program.

Dean served as Chief of the Resource Management Division, Software Development Center, Fort Lee, Va., and as Chief of the Program and Budget Division, Headquarters, Information Systems Engineering Command, Fort Belvoir, Va. (1984-1987). In both positions

she centrally managed Army-wide annual operating budgets amounting to \$60 million and \$756 million respectively.

While serving as a comptroller careerist, she held journeyman program analyst positions in both the Army's Training and Doctrine Command and the Information Systems Command (1981-1984). She entered the Army's Comptroller career field as an Army Materiel Command Intern at Corpus Christi Army Depot in August 1979. Prior to the internship, she spent six years (1973-1978) working in both supervisory and non-supervisory positions in Army finance and accounting offices at Fort Monroe, Va.; Fort Jackson, S.C.; and the Army Corps of Engineers Middle East Division (Rear) in Berryville, Va.

Dean earned her Doctorate in Public Administration from the University of Southern California, Washington Public Affairs Center, Washington, D.C. She holds a Masters of Public Administration from the University of Southern California, Washington Public Affairs Center, Washington, D.C., and a Bachelor of Arts (with honors) in Human Resource Management from Saint Leo's College, Fla.

Dean's executive training includes the Professional Military Comptrollership Program at the Air University, Maxwell Air Force Base, Ala., in 1983 (her team received the academic achievement award); the U.S. Army Mid-Career Executives Program in Public Administration during 1986 through 1987; and, the Federal Executive Institute Program for Leadership in a Democratic Society in 1995.

Prior to assignment in this position, from October 1999 to August 2002, Dean served as the Army's Corporate Information Office's (CIO) C4 Enabling Technologies Director where she directed the implementation of the Army's Common Access Card and Public Key Infrastructure programs, which provide a standardized DoD smart card technology solution for personal identification, digital signatures, and email encryption.

From October 1997 to August 1999 she served in the Army's Office of the Director of Information Systems for Command, Control, Communications, and Computers (DISC4) as the Director, Electronic Commerce (October 1990 through September 1997) and Director, C4 Policy (October 1997 through September 1999), respectively. While in those policy positions, she managed the development of Army-wide policy direction contained in over 200 regulations, pamphlets, and Army policy letters, for the Army's five information mission area disciplines, which included: automation; telecommunications; printing and publishing; visual information; and records management.

Before joining the ODISC4 staff, from 1987-1990, she served as a senior program analyst in the Army's Program Executive Office, Standard Army Management Information Systems (PEO STAMIS). As a senior analyst, she was responsible for oversight of program management activities for several high-dollar (greater than \$100 million in life cycle costs) Army Information Systems, including the Army's Computer Aided Logistics System (ACALS), the Corps of Engineers Automation

the most widely used biometrics technologies, such as fingerprint and iris scan, to serve as a program baseline. Dependence on other biometric technologies, such as voice and facial recognition, will grow as those systems become more mature and are able to satisfy user requirements. The intent is to identify biometric collection devices that will meet user requirements regardless of location or environment, including devices used for both physical and information access.

One solution currently under review by the Collection EWG is to leverage all or portions of the DoD's existing personnel information collection infrastructure. These include:

- All 65 United States Military Entrance Processing Command Stations.
- All fixed Real-time Automated Personnel Identification System locations (RAPIDS).
- All portable RAPIDS workstations that issue Common Access Cards (CACs) within the DoD.

In any event, candidate collection solutions are scheduled for testing during the TD phase in the fourth quarter of fiscal 2003.

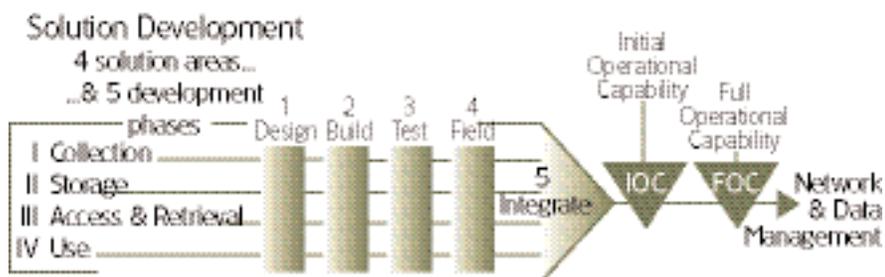
The Repository Enterprise Working Group

This EWG is tasked with identifying the most relevant biometric storage solutions to enhance DoD business and tactical functions. To achieve this goal, the group is focused on researching and recommending optimal biometric repository configurations for local, regional, and central repositories. Candidate repository solutions for local and regional repositories are scheduled for testing in the fourth quarter of fiscal 2003.

Access and Retrieval Enterprise Working Group

The next step in the process is to identify the communications architecture that will best support secure access, retrieval, and management of biometrics data. Working closely with the Defense Manpower Data Center (DMDC), the Access and Retrieval Enterprise Work-

FIGURE 1. DoD Biometrics Management Office Enterprise Solution Development



ing Group is tasked with guiding the design and development of this optimal architecture.

As with the processes previously described, candidate solutions identified by the Access and Retrieval EWG will be tested in the fourth quarter of fiscal 2003.

Use Enterprise Working Group

The Use Enterprise Working Group is responsible for carefully considering DoD end-user requirements in designing an enterprise solution. This group is working closely with the RAND Corporation, which has been tasked with surveying multiple DoD organizations to identify user requirements. Consolidated user feedback is expected during the second quarter of fiscal 2003, in time for candidate solution testing in the fourth quarter of fiscal 2003.

In addition to the four EWGs that constitute the core of the BMO's enterprise solutions development program, five specialized working groups are charged with addressing program-wide enterprise architecture, requirements, policy, legal, and economic issues.

- The **Enterprise Architecture** working group is tasked with determining the optimal architectural configuration between DoD users and the central repository.
- The **Requirements** working group is responsible for identifying functional requirements from the Uniformed Services, DoD civilian political leadership, the Joint Staff, and other DoD agencies to establish future regulations.

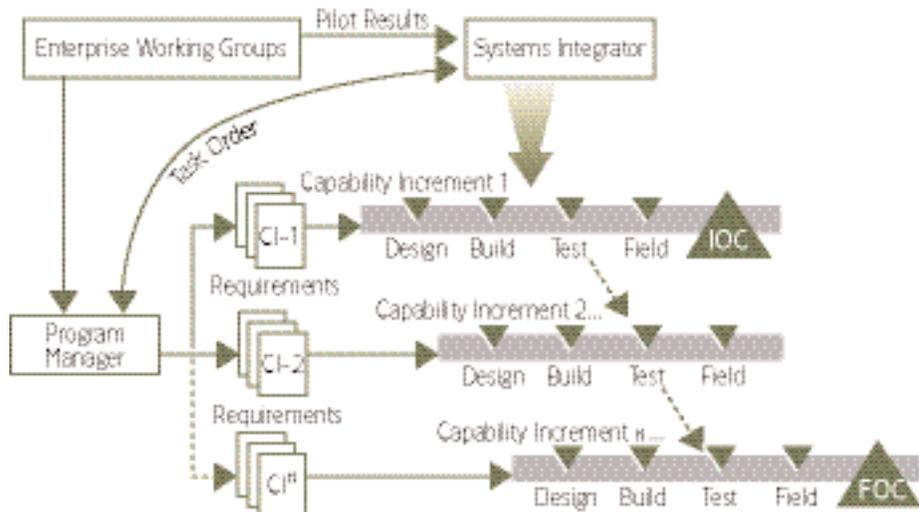
- The **Policy** working group is charged with developing a prescriptive, incremental DoD policy framework that mandates policies and procedures for how biometrics will be acquired, stored, and used.
- The **Legal** working group is tasked with establishing regulatory authority and guidelines for proper collection and disposal of biometrics from active and reserve military personnel, civilians, contractors, family members, and foreign personnel hired by the DoD.
- Finally, the **Functional Economic Analysis** working group is responsible for defining alternatives to support the Program Objective Memorandum (POM) process, and for delivering a cost-benefit model to validate the implementation of the enterprise solution.

Putting the Pieces Together

Once the TDs are complete, the BMO will integrate these functional solutions into a comprehensive Enterprise Architecture. Parallel to this effort, the BMO will develop a policy framework to establish procedures for the collection, storage, and use of biometrics within DoD. Leveraging both the technology solutions and the policy framework, the BMO plans to reach Initial Operational Capability (IOC) by the second quarter of fiscal 2004 and FOC by the second quarter of fiscal 2005. Figure 1 to the left illustrates this process.

During the IOC phase, the BMO will introduce its integrated enterprise solution on a smaller scale to various test populations. This important phase will allow the BMO to identify user concerns regarding technology and operational components of the solution. This information will provide the BMO with a clear picture of which best-of-breed biometric technologies are best suited within each environment, and will allow for fine-tuning and adjusting of the solution as a whole. Collected over the 12-month duration of the IOC phase, this information will drive the Biometrics Management Office's migration plans, as well as its acquisition and deployment plans, for scaling and implementing the solution to FOC across the DoD.

FIGURE 2. DoD Biometrics Management Office Enterprise Solution Management



Enterprise Solution Management

Once the enterprise solution has achieved FOC, the focus of the DoD's biometrics program turns to maintaining and securing DoD biometric data and managing the network over which those data are exchanged. However, the rapidly evolving nature of biometric technologies will continue to present challenges and opportunities for improvement. In fact, as illustrated in Figure 2 on the preceding page, the development of a biometrics enterprise solution is itself an ongoing, iterative process.

This approach follows a "build as you grow" concept, dividing the system into several useful, supportable, and operational increments. In growing biometrics capability, demonstrated technology and operational concepts are incorporated into sequential Capability Increments (CIs). As each CI completes the build phase, it becomes the baseline for the next increment. This ongoing process will ensure that the BMO continues to meet its mission within the DoD, and will ensure that the DoD possesses the identity assurance system that it needs to meet its mission to the people of the United States.

Biometrics—A Prime Security Enabler

As the DoD moves further into the digital age, biometrics serve as a prime security enabler by ensuring positive identification of those accessing critical systems and facilities. This technology offers countless uses for military applications in future systems, including information assurance, force protection, and access control. However, mature technology adoption takes a deliberate, conservative approach in order to achieve optimal effectiveness. The DoD's initiative with the BMO's biometric Enterprise Solution assumes this course of action to ensure that the resulting system architecture is interoperable, scalable, and able to meet the growing demands of our transforming military.

Editor's Note: The authors welcome questions or comments on this article. Contact ssadlon@brtrc.com.

Defense Acquisition University Awarded National Accreditation

FORT BELVOIR, Va. (Feb. 4, 2003)—The Commission of the Council on Occupational Education (COE) has granted accreditation to the Defense Acquisition University, located at Fort Belvoir, Va. Announcement of the action was made by Harry L. Bowman, Executive Director, Commission of the Council on Occupational Education (COE), following the Commission's meeting held in Atlanta, Ga., Feb. 2-4, 2003.

The award of accreditation status is based on an evaluation to demonstrate that the institution meets not only the standards of quality of the Commission, but also the needs of students, the community, and employers.

The Commission's evaluation process includes an extensive self-study by the institution and an intensive review by a visiting team of professional educators representing the Commission's member institutions from other states.

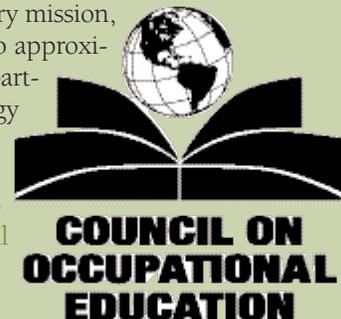
The Defense Acquisition University began its self study in July 2000 and underwent a team visit in November 2002. The visiting team chairperson was James Conely.

The COE, based in Atlanta, Ga., offers quality assurance services to post-secondary workforce education providers across the nation. Organized as a non-profit corporation, the mission of the Council is to assure quality and integrity in career and workforce development. Services offered include institutional accreditation (recognized by the U.S. Department of Education), program quality reviews for states and workforce education providers, and informational services. Most of the Council's work is carried out by qualified professional volunteers who are experts in workforce education.

Institutional membership in the Council is voluntary, but can be achieved only by becoming accredited. The Council's current membership makes it unique. Members include postsecondary public technical institutes, specialized military and national defense schools, Job Corps Centers, private career schools, non-profit workforce education providers, corporate and industry education units, and federal agency institutions. No other agency accredits and serves the diversity of organizations served by the Council. There are approximately 410 institutional members at the present time.

The Defense Acquisition University, with headquarters at Fort Belvoir, Va., has regional campuses in Patuxent River, Md.; Dayton, Ohio; Huntsville, Ala.; and San Diego, Calif. For its primary mission, DAU provides training and education to approximately 129,000 practitioners in the Department of Defense Acquisition, Technology and Logistics Workforce (DoD AT&L).

Editor's Note: To view the DAU 2003 Course Catalog, visit <http://www.dau.mil> and click on "DAU Courses."



DoD Transformation Still on Track

GERRY J. GILMORE

WASHINGTON, March 6, 2003—The Sept. 11, 2001, terror attacks on the United States underscored DoD's need to transform to meet the challenges of the 21st century, Defense Secretary Donald H. Rumsfeld said here today.

In his opening remarks to military and civilians gathered at the fifth Pentagon town hall meeting, Rumsfeld recalled that he'd spoken to Pentagon employees about transformation issues at a similar gathering the day before the attacks.

At that time nobody knew terrorists were about to launch their attacks against America the next day, Rumsfeld pointed out. Immediately after the attacks, some people, he

said, thought transformation should be put on hold, in order to better prosecute the war on global terrorism.

"The opposite was true," the Secretary emphasized. "Indeed, the attacks of Sept. 11 make transforming the Department even more urgent, because they have awakened us to a fundamental truth."

America has entered a new security environment, where, Rumsfeld remarked, "the nexus between terror and terrorist states and weapons of mass destruction means that attacks in this 21st century will be more likely—(and) very likely more deadly—than at any time in modern history."



An Air Force sergeant asks Defense Secretary Donald H. Rumsfeld a question during a "town hall" meeting at the Pentagon, March 6, 2003.

Photo by Robert D. Ward

Although the United States and its allies have routed terrorists in Afghanistan and elsewhere in the world early in the war, the Defense Department is “still not yet arranged to deal successfully with this new security environment,” he stated.

DoD entered the 21st century configured “to fight big armies, big navies, and big air forces,” Rumsfeld said. It isn’t arranged, he added, “to fight the shadowy terrorists and terrorist networks that operate with the support and assistance of terrorist states.”

To win the global war on terror, America’s armed forces have to become more flexible and agile “so our forces can respond more quickly,” Rumsfeld pointed out. “Today, we still do not yet have that agility.”

The Defense Department “is still bogged down to too great an extent in the micro-management and bureaucratic processes of an earlier era,” he said. For example, he said, DoD wants to be like a private-sector corporation and be able to transfer money from department to department rapidly, as needed, rather than haltered by myriad outdated rules.

Today, he added, more than 300,000 servicemembers are performing essentially non-military jobs, “and yet, we’re calling up reserves to help deal with the global war on terror.”

Hundreds of thousands of manhours are consumed preparing reports that are likely not read and are “of marginal value,” he noted.

And the time to produce a weapon system at DoD has doubled since 1975, Rumsfeld remarked, “in an era when new technologies are arriving in years and months, not decades.”

Today’s DoD was set up to meet the challenges of the mid-20th century, not the 21st,

he declared. However, steps to eliminate waste and duplication have taken place on his watch, the Secretary said.

For example, headquarters staffs across DoD have been reduced by about 11 percent, he said. The acquisition process has been streamlined “by getting rid of hundreds of pages of rules and regulations and allowing program managers—we hope—to be more innovative, flexible and creative,” he added. A new financial management system is slated to debut this spring, he said, that will help DoD to greatly reduce the 1,800 different information systems it currently uses.

Rumsfeld said he wants to revamp DoD’s civilian personnel system, making it more flexible and responsive “so we can attract and retain and improve the performance of our 700,000-plus civilian workforce.”

Opening the floor to questions, he fielded inquiries about Iraq, transformation, and other topics. A female Air Force civilian employee asked if there was a way to streamline the paperwork and bureaucracy required for hiring new people.

Rumsfeld gestured toward David Chu, the Pentagon’s top personnel manager, and said: “David Chu, fix it.”

The auditorium erupted in laughter. Chu told the Air Force employee that civilian personnel management is one of the things DoD has marked to revamp as part of its transformation.

“That’s exactly what we want to try to change,” he said.

Editor’s Note: This information is in the public domain at <http://www.defenselink.mil/news>.

The Business of Metrics— Measuring the Product of the Plan

How Do You Know What You Know?

REAR ADM. DAVE ANTANITUS, USN

Your first impression of the title of this article may be that it is written primarily for acquisition professionals (APs) or for “budget weenies.” You are right. However, I would submit that for any of us who control money, whether that be an ACAT I program manager developing the latest weapons system or a division officer managing a portion of ship’s OPTAR (Operating Target), we are all at least part AP, and if we are not all “budget weenies,” we probably should be (that is, unless, you have an unlimited budget!).

Developing Metrics

This article addresses the process of developing metrics, the objective sets of data we use to measure how we are doing relative to goals, and how we are improving, declining, and the reasons for both. If you control any amount of money, are part of or own a process, have people working for you, or work for somebody who imposes goals and standards, this article is for you. I guarantee you that you are not measuring everything you should.

Why Develop Metrics at All?

The first question to ask is, “Why develop metrics at all?” The answer is simply to improve your per-

formance. You think you know how you are doing, but how do you really know unless you have the objective quality evidence to prove it? Put another way, “how do you know what you know?” In the case of Space & Naval Warfare Systems Command (SPAWAR), as we started fielding IT-21 (Information Technology for the 21st Century)—the U.S. Navy’s IT program to improve shipboard

communications and computing capability—our customers voiced significant dissatisfaction in our ability to field systems that worked, were cost effective, and could be delivered on schedule.

We “knew” we were not as bad as our customer was telling us. We were good people, working hard to deliver the best products and services we could to the



Fleet. Yet, our reputation was in the toilet. We had no substantive data, no metrics, to document where our money was spent, why it was spent the way it was, and why some systems were troubled. We wanted to be the premier provider of IT systems for Navy, but the truth was our processes really were broken, and we were not measuring anything to develop the knowledge to make our processes better.

You develop metrics, then, to measure your processes. Your analysis of your metrics then provides knowledge, which is fed directly back into your processes. The result should be improvement in your processes, which will be borne out by your subsequent metrics. Much like a systems engineering approach, this is a recursive and iterative process for improvement in your processes, and ultimately in your performance.

In SPAWAR, we had plenty of incentive to embark on process improvement, and today's metrics show where performance has substantially improved as well as areas that still need the work. The difference between now and three years ago is that we now understand our processes, we know what drives them, and we are measuring them. How do we know this? Our customers have told us.

Where Do We Start?

We all have things we should be measuring, but for whatever reason, we do not. Given this situation, and the knowledge that we do need to improve our performance and do need to develop metrics, where do we start? Well, we could just start measuring anything and everything and see what falls out. We could hire an outside contractor to come into our organization and do this work for us. There are several very professional contractors out there willing to

do this work for us, but if we are looking to “buy a miracle” from a contractor, what will we have learned in the long run?

A better approach is to do the work ourselves. Think about this for a while. If you hire a contractor, don't they come in and learn what it is you do for the first few weeks? The point may very well be that you do not understand what it is that you do or do not understand about the processes you use to do your job. If this is an honest assessment of your starting point, why would you hire someone else to figure it out for you?

A good way to start on your metrics development journey is to map out your core competencies (what it is that you do) by organization, department, division, and so on down to the desired level. When you have defined and agreed upon your core competencies, the

next step is to map the processes you use to execute your mission to the core competencies. This again, is not easy. In SPAWAR, it took us several meetings before we reached consensus on these first two steps, and we are still refining these areas as missions and tasks change or evolve. The last step is to identify metrics (things you would like to measure) to assess how well you execute your processes. Yes, a contractor could do this for you, but I contend the best product is generated internally.

What Makes a Good Metric?

First and foremost, a good metric is measurable. Examples include cost, performance, reliability, schedule, or anything else that has numbers readily associated with it. (Be careful here—just because you can measure something does not mean it is a useful metric!) Secondly, a good metric is one that maps directly to a strategic goal or has a tactical focus. A strategic goal may take the form of the CNO (Chief of Naval Operations) objectives, Type Commander strategic goals, or even the goals of a Battle Group for a given deployment. Metrics with a tactical focus would be a level or more below the organizational or corporate level, but would be similar in content and would map to higher-level goals or objectives.

Measure the Right Things

The metrics you develop and track need to be part of your everyday job. If you are tracking metrics just to maintain data, you are measuring the wrong things. Do not hesitate to discard metrics that you find you are not using on a day-to-day basis. You need to focus your attention on things that make a difference. If you are measuring the right things, your metrics provide knowledge to improve your processes, are important to your boss, are important to your customer, and in a sense, “tell your story” for you.

Share your data and your conclusions with your customers frequently. They will tell you if you are measuring the right things. Have open books, build trust with your customers and stakeholders, and keep feeding the metrics



Why develop metrics at all? The answer is simply to improve your performance. You think you know how you are doing, but how do you really know unless you have the objective quality evidence to prove it? Put another way, “how do you know what you know?”

DAVID J. ANTANITUS REAR ADMIRAL (LOWER), USN

Director, Installations & Logistics (SPAWAR 04)
Space & Naval Warfare Systems Command

Rear Admiral David Joseph "Dave" Antanitus is a native of La Salle, Ill. He graduated from the United States Naval Academy in 1974 with a Bachelor of Science degree in Mathematics.



A member of the acquisition professional community, Antanitus is currently serving as the Director for Installations and Logistics in the Space and Naval Warfare Systems Command. His previous acquisition assignments include serving as a major program manager in the Naval Sea Systems Command's Deep Submergence Program (NAVSEA PMS-395) and Major Program Manager in SPAWAR's Fixed Undersea Surveillance Program (PMW-181).

Antanitus entered the Submarine Service upon graduation from the Naval Academy, and his initial sea tour was aboard the nuclear-powered attack submarine *USS Parche* (SSN 683). He

went on to serve as Engineer Officer of the fleet ballistic missile submarine *USS Ulysses S. Grant* (SSBN 631) and Executive Officer of *USS Boston* (SSN 703).

His shore tours included duty on the staff of Submarine Squadron 14 in Holy Loch, Scotland, and Weapons Systems Analyst for the Chief of Naval Operations Office for Naval Warfare (CNO OP-07).

Antanitus assumed command of the pre-commissioning unit for the Los Angeles class attack submarine *Hampton* (SSN 767) Aug. 12, 1991. He took the ship through commissioning, initial sea trials and fitting out, and commissioned it *USS Hampton* Nov. 6, 1993.

Antanitus' personal awards include the Legion of Merit with gold star, the Meritorious Service Medal, and the Navy Commendation with four gold stars.

back into your processes to improve your performance. This approach really does work, and once you get it going, it is just part of your daily routine.

Fleet Modernization and the D-30 Process

To illustrate how metrics really do make a difference in becoming more efficient, let's look at how we do Fleet modernization. Again, this is a SPAWAR point of view, but the processes involved and metrics measured could be used by any organization.

The chart on p. 13 shows the timeline for the D-30 process, which is mandated by the Fleet for modernization. Taking a look at the first 6 months of the timeline, you can see that Battlegroup (BG) composition should be identified at D-30, the first planning conference held at D-28, a final planning conference at D-25, and the final baseline for the BG established at D-24.

At SPAWAR, we keep track of, or measure the dates of these meetings and conferences. While the exact dates for these milestones may not be critical, planning meetings and conferences that take place on schedule provide good "leading" or predictive metrics for how successful we will be in providing cost-effective modernization for the BG. Specifically, the final baseline must be established on or before D-24 (or 1 month prior to BG deployment). This allows the planning yards to ship check individual ships for the new systems they will receive in their post-deployment CNO availability before they get underway for their near-term deployment. This then allows the planning yards to develop integrated System Installation Drawings (SIDs) while the ships are deployed.

Similarly, with completed SIDs, funding put in place, Government Furnished Equipment (GFE) received, and installation contracts let prior to return from deployment, the installation contractor has ample time to plan for modernization before the ship returns and hit the ground sprinting once the CNO availability starts.

In SPAWAR, we have found that with everything working perfectly, you can get a contract awarded up to 100 days...In many cases, early contract award has resulted in installation cost savings of up to 30 percent, and the metrics show how and why.

The planning phase of modernization discussed here is a process with numerous metrics mapped back to it. In addition to dates, other metrics include ship check completion, SID completion, ShipAlt Record (SAR) approval, installation funding, GFE delivery, and Integrated Logistics Support (ILS) certification and many, many more. All of these metrics roll up into contract award for a consolidated installation package. In SPAWAR, we have found that with everything working perfectly, you can get a contract awarded up to 100 days prior to the start of a CNO availability. In many cases, early contract award has resulted in installation cost savings of up to 30 percent, and the metrics show how and why.

As with most things in life, however, the planning and execution of modernization rarely goes perfectly. Poor ship checks spawn errors, SIDs are inaccurate or incomplete, or GFE is not properly kitted for an optimum installation. So, once your high-level metrics have identified areas of concern, you have to develop and analyze lower-level metrics to really get at the root cause of your problem. In the case of drawing errors, we found that we were spending millions of dollars every year in rework due to inaccurate SIDs. Armed with this data (or metrics), we were able to go back to the individual planning yards and discuss process improvements they needed to implement to provide us, the customer, with a more cost-effective product.

Interestingly, most of the yards kept no metrics on their performance with respect to drawings. They just assumed they were doing fine, not knowing how well they really could do. Once they started tracking the right metrics and started feeding them back into their processes, we saw error rates drop by as much as 50 percent! This is one of many examples where our metrics were used to make a process more efficient. Put another way, *metrics modify behavior*.

For every step in planning and execution of modernization, we found many things we could measure and many areas we could improve. We continue

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to work on these areas for every ship we modernize. We also found that when measuring our cost effectiveness in delivering the end product, there were events that we could not control, and some of these were real cost drivers.

Baselining (that is, establishing a modernization installations package) a BG two years before deployment is somewhat of a crystal ball exercise. We all do the best we can in predicting composition and requirements for individual units, but over the course of two years, “stuff happens.” Ships’ schedules change, units in BGs are swapped for operational and maintenance reasons, and world events can alter dramatically. All of these reasons lead to changes in BG composition and ship requirements after the D-24 baseline is set.

Consider the scenario where at D-20 on the nominal timeline, Cruiser A is swapped out for Cruiser B for the subsequent deployment. The immediate effect is that the money spent to ship check and complete SIDs for Cruiser A is lost, and new funds have to be iden-

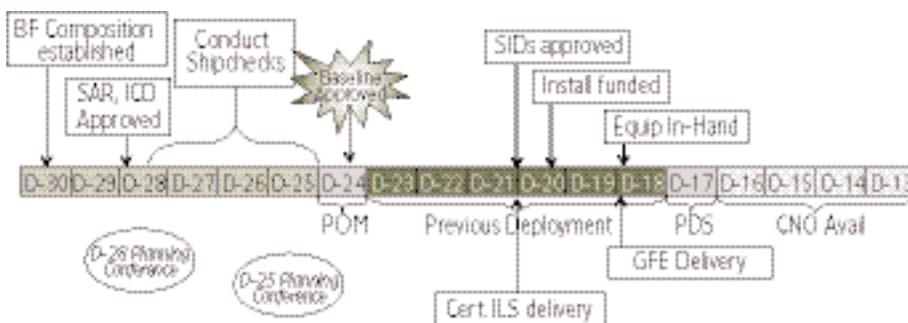
tified to ship check and complete drawings for Cruiser B. Additionally, if Cruiser B is deployed, we may have to expend additional travel and Per Diem expenses to ship check at sea, and we may have to pay the planning yard additional funds to expedite drawing development to support a CNO availability on an earlier timeline than planned.

There is no free lunch here, and operational failure is not an option, but responsiveness has a price tag attached. We always get the job done, but the later in the cycle an installation is turned on or a change is made, the more it costs. It is important to measure this cost of responsiveness and share it with the customer. They need to understand how they are driving costs so they can make sound business decisions as well as operational ones. The metrics in this case help both the provider and customer optimize their processes.

Execution—Where the Rubber Meets the Road

While the planning metrics provide all the leading indicators for success, the

D-30 Process (Deployment – 30 Months)



rubber meets the road in execution. The final cost, schedule, and performance measure the total product of the plan.

- For *cost* performance, there is no approach better than the Earned Value Management (EVM) system. (EVM is a system that uses work completed vs. funds expended to develop cost and schedule performance indexes. It develops a Cost Performance Index [CPI] and Schedule Performance Index [SPI] to assess work efficiency as it is being performed. Courses in EVM are taught by the Defense Acquisition University [DAU] and are also offered online.)
- *Schedule* is measured directly in time to accomplish work.
- *Performance* is measured in a variety of methods, from CASREP (Casualty Report) free time to performance vs.

advertised standards. Again, metrics shared between the provider and the customer provide a common reference for the success of the modernization performed.

Good Metrics Evolve

The modernization example demonstrates how we started by identifying a core competency, mapped our processes to it, and developed metrics to measure the process. Actually, the example given discussed only a small fraction of the metrics we measure on a daily basis. There are many more at several different levels required to fully understand what is driving our cost, schedule, and performance and ultimately to provide the objective evidence to let us “know what we know.” Good metrics also evolve, and by continually measuring

the same things, you may be missing new opportunities to improve.

Set Goals

When you start measuring your processes, set goals. When you achieve your goals, raise the bar and keep measuring. Push your metrics to your customers and show your customers how they can contribute to process efficiency. You really are what you measure, and measuring the product of the plan needs to be part of doing business every single day.

Think you are doing fine?—Show me the metrics!

Editor’s Note: The author welcomes questions or comments on this article. Contact him at david.antanitus@navy.mil.

DAU SOUTH REGION SIGNS MOA WITH U.S. ARMY SPACE & MISSILE DEFENSE COMMAND & ACQUISITION SUPPORT CENTER, SOUTHERN & WESTERN REGIONS



On Feb. 5, 2003, the Defense Acquisition University South Region (DAU South), located in Huntsville, Ala., and representatives from the U.S. Army Space and Missile Defense Command (SMDC) and the Acquisition Support Center (ASC), Southern and Western Regions, signed a Memorandum of Agreement (MOA) establishing and entering into an educational and strategic partnership. Their partnership will seek to leverage mutual learning opportunities.

Signatories of the MOA were from left: Maxine Maples Kilgore, Director, ASC Southern and Western Regions; Mark Lumer, Principal Assistant Responsible for Contracting, U.S. Army SMDC; and Jim McCullough, Dean, DAU South Region.

For more information on DAU Strategic Partnerships, contact Wayne Glass at wayne.glass@dau.mil.

Photo by Debra Valine

Distance Learning Technology Brings Instructors to Students

GERRY J. GILMORE

WASHINGTON, March 13, 2003—The Air National Guard's distance-learning programs are recognized as some of the most advanced within the Department of Defense.

About a decade ago, DoD asked the Services to step up research and implementation of distance-learning methods as a means of training servicemembers, said Master Sgt. John Kayko, superintendent for the Air Guard distributed learning program.

"E-learning," "distance learning," or "distributed learning" is any method of instruction where the instructor isn't physically present," Kayko explained. Classes may be conducted via satellite broadcast, on CD-ROM, over the Internet—even by teleconference.

For years the Air National Guard has adopted many cutting-edge training and education techniques—especially e-learning methods, he noted.

"We follow private industry and try to get the very latest e-learning technology they're using and adapt it to our DoD-related methods," Kayko explained.

In 1995, the Air Guard put in a satellite-based learning system called the "Warrior Network" and concurrently created its distance learning policy branch, he explained. The Air National Guard and Army National Guard mutually share the Warrior Network and many other e-learning resources, he noted.

Kayko said the Air Force's version of the Warrior Network is the Air Training Network, or ATN. Many other federal agencies, he noted, share ATN's satellite system.

E-learning technology saves money "because you're not sending people from the home unit to another state to take these courses," said Maj. Dean DeJong, chief of the Air Guard advanced distributed learning section. This type of training is especially beneficial for guardsmen who may live far away from their units, he pointed out.

"We can deliver an education or training course pretty much anywhere in the world, even if servicemembers are on deployment," noted Master Sgt. William Quarles, Air Guard advanced distributed learning program manager.

In a joint project called "Project Alert," the University of Nebraska is working with the Air Guard and

Army Guard to develop common courses suitable for e-learning, Kayko said. One example is a hazardous material-handler training course that's available to servicemembers on CD-ROM and on the Web.

"Such training is applicable, of course, to all the Services, and many other federal agencies," Kayko pointed out.

He said the Air Guard's Warrior Network is mostly televised by satellite with three uplink sites and 202 downlink sites or classrooms.

The classrooms feature high-definition television monitors and open speaker systems, so the students can communicate with the instructor, Quarles explained. Students can see the instructor, ask questions and get a response back, he added.

Multiple hookups can be used to connect several classrooms of students, Quarles pointed out. One such course using this networking technique is the Satellite NCO Academy, he remarked. The program consists of 13 weeks of satellite-broadcast lessons and two weeks of resident instruction.

The active Air Force provides the majority of formal resident training to Air National Guard members and Air Force reservists, Kayko explained. The Air Force plans to convert some classroom instruction to e-learning format. In fact, Kayko added, the Air Guard will assist in converting some of the active Air Force's resident training instruction into distance-learning form.

He noted that several active Air Force courses are now being converted to e-learning format via Project Alert.

DoD's advanced distance-learning Sharable Content Object Reference Model courseware is currently being used by the Services in providing standardized Internet-based instruction, Kayko pointed out.

"Multiple agencies can use the same tool, thereby saving money and sharing the courseware," he concluded.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

DoD Recognizes Top Info Technology Performers

GERRY J. GILMORE

WASHINGTON, Jan. 22, 2003—Top performers across the Defense Department's information technology realm recently took home DoD Chief Information Officer (CIO) Award honors.

The CIO Awards program, now in its second year, recognizes outstanding achievement in at least one of seven key areas of information technology outlined in the Clinger-Cohen Act of 1996: acquisition; architecture and interoperability; information assurance; management and standards; applications (technology or process); capital planning and investment; and information management/information technology workforce.

Recognized achievements provide better service, cost-savings, and significantly impact DoD's information technology mission.

Section 5123 of Clinger-Cohen (co-named after then-U.S. Sen. and former Defense Secretary William Cohen) requires DoD to leverage information technology and adopt related goals toward improving efficiency and effectiveness across the department.

DoD CIO Awardees for 2002 include:

Team Award Winner: U.S. Air Forces in Europe (USAFE) Network Operations and Security Center, Ramstein Air Base, Germany, developed information technology solutions to improve information assurance for more than 40,000 customers across 10 European and Asian countries. Also developed a more efficient, computerized "one-stop" personnel-processing system that greatly enhances quality of life for USAFE service members, family members, and DoD civilian employees.

Second Place Team Winner: The Navy Supply Information Systems Activity, Commercial Asset Visibility II System Team, Mechanicsburg, Pa., developed a computerized logistics system that tracks and monitors supply assets in the repair cycle, providing 99.55 percent accurate accountability of stock in transit for repair. The system is credited saving (with) more than \$300 million in inventory management and \$1 million in direct labor costs.

Third Place Team Winner: The Headquarters, U.S. Army Knowledge Online team's Web site, https://www.us.army.mil/portal/portal_home.jhtml, is recognized by *CIO Magazine* as one of the top 50 across business and government. InfoWorld also ranked the Army as No. 10 out of 100 organizations for its innovative use of information technology.

Team Award Finalist: Information Support Activity, U.S. Army Accessions Command, Fort Monroe, Va., used information technology to improve recruiting operations, including a special Web portal that monitors quality of service and performance.

Team Award Finalist: The efforts of the U.S. Marine Corps Legacy Applications Team at Quantico, Va., were cited for significantly improved computerized systems used to support the warfighters, while ensuring that legacy computer databases have been identified, tested, and certified before being transitioned into the improved and interoperable Navy-Marine Corps Intranet system.

Individual Award Winner: Army Maj. Mitchel Hudson, Director of the Information Support Activity at the U.S. Army Enlisted Records and Evaluation Center, Indianapolis, is credited with developing an on-

line site for official military personnel files. He integrated the personnel electronic management systems networks of the Total Army Personnel Command, the Enlisted Records and Evaluation Center, the National Guard Bureau, and the U.S. Army Reserve Personnel Command. Savings are expected to exceed \$1.1 million.

Second Place Individual Winner: Col. John M. Maluda of Headquarters, U.S. Air Forces in Europe, Ramstein Air Base, was cited for a computer security initiative that realized a 68-person staff reduction and established a common standard for computer security operations.

Third Place Individual Winner: Thomas J. Sheehan, Deputy Director for Information Technology Management in the Pentagon's Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, worked to accomplish successful testing of a secure, remote, dial-up communications system for senior DoD leaders to use in the event of addi-

tional terrorist-precipitated actions. As part of another pilot project, he also worked to marry wireless technology with the OSD Enterprise E-mail system.

Individual Award Finalist: Marine Corps Lt. Col. Hal M. Gobin, U.S. Marine Forces Atlantic at Norfolk, Va., was recognized for his role in helping to establish DoD's Public Key Infrastructure program within Marine operations along the Atlantic coast of the United States.

Individual Award Finalist: Naval Reserve Cmdr. David M. Wojda, Naval Reserve Forces Command, New Orleans, worked to ensure legacy Naval Reserve computer databases and systems were inspected and compliant for transition to the Navy-Marine Corps Intranet.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

Acquisition Programs/Total Information Awareness—Aldridge Briefs Media

On Feb. 7, Under Secretary of Defense (Acquisition, Technology & Logistics) Edward C. “Pete” Aldridge Jr., held a Pentagon briefing followed by Q&A on Acquisition Programs and the Total Information Awareness (TIA) program. Also participating was Michael Wynne, Principal Deputy Under Secretary of Defense (Acquisition, Technology & Logistics).

I have a few opening comments this afternoon, and then we’ll open it up for any questions you may have. I will first address some actions we’ve taken to modify our operation of the Total Information Awareness [TIA] project being undertaken by DARPA [Defense Advanced Research Projects Agency].

Total Information Awareness

As you know, TIA is a project to demonstrate information technologies that can be used as tools to prevent future terrorist acts anywhere in the world. There have been some concerns expressed regarding the protection of the privacy of individuals, and to address those concerns, we’re establishing two oversight functions.

INTERNAL TIA OVERSIGHT BOARD

The first is an internal TIA oversight board, which I will chair. This board will establish policies and procedures for the use within the Department of Defense of those technologies and will establish the protocols for transferring those technologies to entities outside of the Department of Defense. Other than myself, the internal board will consist of the Under Secretaries of Policy and Personnel and Readiness; the Assistant

RAH-66 Comanche aircraft.
Photo courtesy The Boeing Company



Secretary of Defense for Command, Control, Communications and Intelligence; the Assistant Secretary of Defense for Legislative Affairs; the Assistant Secretary for Public Affairs; the General Counsel; and the Assistant to the Secretary of Defense for Intelligence Oversight. The first meeting of this board will be held at the end of this month.

EXTERNAL TIA FEDERAL ADVISORY COMMITTEE

We’re also establishing an external federal advisory committee that would advise the Secretary of Defense on the range of policy and legal issues that are raised by the development and potential applications of TIA technologies. The charter of this committee and [a list of] its members are included in a statement that I believe was released just earlier today [p. 10], which will give you the names and what the purpose of that external board will be.

Acquisition Programs

I would now like to turn to management and improvement issues and to some of the weapon systems decisions that we’ve made as part of the president’s

FY ’04 budget request. Dov Zakheim briefly covered some of these at his budget briefing on Monday, but I’ll give you the opportunity to ask questions if you need more detail.

DoD 5000 SERIES

The DoD 5000 series, the documentation that establishes the DoD weapons acquisition system, is ready for the Deputy Secretary of Defense’s signature. We expect that momentarily. The DoD 5000.1 directive is now three pages, with a five-page attachment. DoD 5000.1 tells us what we want to accomplish with our acquisition system: flexibility, responsiveness, innovation, discipline, and streamlined and effective management.

The DoD 5000.2 instruction is now 12 pages, with a 24-page attachment, telling us the management framework and the elements that must be incorporated in our acquisition plans, such as evolutionary development, milestone decision points, technology plans, and criteria for entering the various stages of the programs. Those are some of the things that they cover.

Aldridge is the Under Secretary of Defense (Acquisition, Technology & Logistics), The Pentagon, Washington, D.C.

You can actually read this document and know what to do. The old documentation—the directive, instruction, and regulation—was a total of 250 pages, and I will assert was never read. Hopefully, this one will be.

SPIRAL DEVELOPMENT/ PROGRAM STABILITY

In accordance with my goals, most of our major weapon systems now have an acquisition strategy that includes evolutionary spiral development, and to the best of our knowledge, are properly priced to meet the schedule and performance objectives. We have budgeted these programs, for the most part, based upon independent cost estimates that

COMANCHE

We've restructured the Comanche program. It's now reconfigured for reconnaissance and light attack, and we've reduced the numbers to about 650—that's roughly half—pending the outcome of the review of the Future Combat System of the Army. The program was having some difficulty in achieving its performance objectives for the full attack capability, and we decided to limit its capabilities for now.

MISSILE DEFENSE

The president has directed we provide a limited capability for defense against long-range ballistic missiles by upgrading the missile defense test bed with in-

conversion of the four Trident submarines to very capable, conventionally weapon-armed SSGNs [Nuclear Powered Cruise Missile Submarines].

The DDX (destroyer) program continues with its focus toward technologies applicable to a family of ships—cruisers, destroyers, and littoral combat ships—consistent with last year's restructuring.

**THE DoD 5000
SERIES...IS READY
FOR THE DEPUTY
SECRETARY OF
DEFENSE'S
SIGNATURE. WE
EXPECT THAT
MOMENTARILY...
IT'S PRESCRIBING
WHAT WE WANT
YOU [PROGRAM
MANAGERS] TO DO,
BUT NOT THE
RECIPE OF HOW TO
DO IT.**



Image courtesy Northrop Grumman
DD(X) artist's rendition

tend to be more accurate than those provided by the military departments. I believe these two elements—spiral development and properly pricing programs—are essential if we are to deliver the weapon systems to the warfighter on schedule and within the performance that we have promised.

FUTURE COMBAT SYSTEM

Regarding major acquisition activities, we've added funding—about \$1.3 billion—for the Army's Future Combat System. The Army has made a conscious decision to defer modernization of some of its legacy equipment in favor of investing in the future of the Army. A major decision is planned for May of 2003 to enter into system development and demonstration Milestone B. We're having monthly reviews with the Army as we lead up to this decision point.

terceptors, a sea-based component, improved land-based radars, and a plan to evolve this capability through evolutionary spiral development in the future.

The first missile defense component ready for deployment—the PAC-3—is being transferred to the Army in accordance with our management plan for missile defense. You may recall that our management plan calls for the military department to assume the deployment operations after the capability has been developed by the Missile Defense Agency.

SHIPBUILDING

We've increased the shipbuilding rate from five ships to seven in FY '04, and plan to gradually increase this rate through the FYDP [Future Years Defense Plan] period. We're continuing with the

The CVNX (aircraft carrier, nuclear, experimental) program has been restructured to place as much technology as possible on the lead ship, now called the CVN-21. New propulsion plant, electric catapult, reduced manning, improved survivability, and more efficient flight operations are the keys to this new carrier, planned to be available in the 2011 period. And plans for a second ship to begin construction in 2011 will further enhance carrier effectiveness.

F/A-22

We've had some delays in the flight test program that have resulted in a trans-



Joint Strike Fighter
Photo courtesy Lockheed Martin

fer of some funding from procurement to R&D [Research & Development]. Recent results have shown that the flight-test program is recovering, but we've had to slow the production somewhat in the near term. This has not increased the cost of the program since we have a "buy to budget" plan for the F-22.

F/A-18

We're continuing production of the F/A-18E/F at a rate of 42 per year. We will introduce the production of the F/A-18G, which is the electronic warfare version, in FY '06, and the combination of the Es, the Fs, and the Gs will total 42 aircraft a year throughout the FYDP period.

V-22 OSPREY

The flight test program for the V-22 is going well, with over 250 hours of testing since its return to flight. They're doing high rate of descent and shipboard compatibility testing now—the more difficult and challenging testing period. I will travel to Patuxent River next week to review the results and the future plans for the flight test program.

JOINT STRIKE FIGHTER

The Joint Strike Fighter development is progressing well. There will be a major engine test this year, and we're a little over 2-1/2 years away from first flight of the development aircraft. Our eight

international partners are heavily involved in the development, and their local companies are winning contracts for various components. As you know, the United Kingdom picked the STOVL [Short Takeoff from Vertical Landing] version of the Joint Strike Fighter, as the aircraft that will go on their new carrier, the winner of which we just announced last week.

We're finalizing agreements with Israel and Singapore for potential purchase of the JSF through a security cooperation and participation arrangement. This is much like a Foreign Military Sales activity.

We've accepted the results of the Navy-Marine Corps Tactical Air Integration Study. Better integration of the elements of the Navy and Marine Corps missions and the integration of a more reliable, available, and improved capability Joint Strike Fighter have permitted the Navy and the Marine Corps to reduce the number of aircraft required to accomplish their mission. There should be no effect of this decision in the near term, and we expect international sales to more than offset the reduction in the Navy's Joint Strike Fighter numbers.

OTHER TRANSFORMATIONAL PROGRAMS

Other transformational programs are continuing. The Transformational

Communication System, TCS, which is the equivalent of putting fiber optics in space; the acceleration of the UAVs [Unmanned Aerial Vehicles] and UCAVs, [Unmanned Combat Aerial Vehicles]; and a serious start on a spaced-based radar are in the budget. We've accelerated our efforts on hypersonic technology and have allocated about \$1.3 billion in our science and technology budget for high-speed hyper-sonics and space technology.

2004 Budget Request

Let me close by commenting briefly and in general on the president's budget requests.

We've done a lot of good things in this budget to address deficiencies and problems. We've balanced our needs for our people, our readiness, our modernization, and transformation; we've balanced the near-term risk versus the far-term risk; and we feel comfortable that this balance is right.

However, there are some things we did not do. We would have liked to eliminate sub-standard family housing units faster; we would have liked to have recapitalized our infrastructure at a faster rate; we would have liked to have bought more tactical aircraft at a faster pace to reduce the average age of our tactical Air Force; we would have liked to have gotten our shipbuilding rate up to 10 ships a year versus 7 to sustain the size of the Navy; and we would have liked to have gotten our science and technology budget up to our goal of 3 percent versus the 2.7 percent that's in there now. Again, balance is the key, and we believe overall, it's about right.



Mind if I ask you a couple of questions about the Comanche program? You mentioned that the numbers were halved, and you attribute that, it seems, largely to the fact that the role is limited to recon and light attack. But I'm hoping you can elaborate upon this. My understanding is that before the DAB [Defense Acquisition Board] in the fall, the program really was in serious jeopardy. And

there was a lot of analysis, there was a lot of reworking, restructuring the program that was done, basically, as I understand, that gave you and your staff a comfort level with the program. Can you elaborate upon what sort of restructuring, what sort of analysis gave you a comfort level? And why these numbers, as opposed to the 1,200?

A The original Comanche program was over 1,200 aircraft, including variants that included light attack plus attack versions. And as we looked at the weight required to hang more and more capability on the Comanche, it was very clear that the risk was extremely high as we got further and further into heavier and heavier requirements. And that was causing the program to slip; it was causing them to spend a lot of money on capabilities that we weren't sure we really needed.

So we looked at that program to try to reduce the risk. There was an independent look done by IDA [Institute for Defense Analyses], General Larry Welch, who felt that there was too much risk in these high-end requirements. And we decided to slow down the program—focus it on what we could achieve with high confidence, which was the light attack plus reconnaissance—and then look at the structure of what the Army needed for their Future Combat System [FCS]. All of these are related decisions.

The decision coming up in May on the Army's FCS is really going to be a major decision relative to the future composition and size and components of the Army. We felt that [by looking at] the Comanche program, with its 650 aircraft, and the FCS, then we can make a decision on how all those fit together at that particular time. But risk was the key thing behind it.

Q Can I just follow up on that? One thing in particular, the UAV component of it—you know, a lot of people wonder why can't the armed recon mission be done by a UAV? And there's a big push at the DoD level in the Army to pursue the UAV. There was some analysis done, as I understand it, that

basically addressed that question. Can you talk about that?

A Well, that was one of the other factors that went into the question of what is the size of the Comanche we should be planning for now. Given [the fact that] we don't know how all that fits together, we can define a structure of the Army that could use roughly 650 Comanches, and then let these other issues—Future Combat System, the role of UAVs—play out before we made a final decision as to the direction of the Army.

WE'VE DONE A LOT OF GOOD THINGS IN THIS [2004] BUDGET TO ADDRESS DEFICIENCIES AND PROBLEMS. WE'VE BALANCED OUR NEEDS FOR OUR PEOPLE, OUR READINESS, OUR MODERNIZATION, AND TRANSFORMATION; WE'VE BALANCED THE NEAR - TERM RISK VERSUS THE FAR - TERM RISK; AND WE FEEL COMFORTABLE THAT THIS BALANCE IS RIGHT.

Q *The Senate passed an amendment [Wyden-Feinstein Amendment, Jan. 23, 2003] designed to severely curb both research and deployment of the Total Information Awareness system. Do you think that the advisory committees, which you have announced today, should lead the conference committee to drop that amendment? Or what do you think about it?*

A We're working with the Congress on their amendment. We've actually briefed Senator Wyden on that concept, and we think we can probably come to a compromise that is acceptable to all.

Q But do you think these elements address some of their concerns?

A Yes.

Q Can you say a word or two about the Boeing tanker lease proposal and how far along you are? You've had a series of meetings. It looks like you're getting close to a decision.

A It's hard. You're right, we have had a series of meetings within the [Pentagon]. We've had Boeing in to talk to them some more. It is a major investment required by the Department of Defense.

It's something new—anything new leads people to ask questions about whether or not it's doable. But we are working it now. In fact, we're having meetings this week, and we'll try to wrap up some direction, hopefully next week, on this whole idea.

We're looking at the military value; we're looking at how we do a lease that would protect the taxpayers' interest; what are the other alternatives, lease versus buy? Those kind of things are all being assessed at this point. No decision has been made as of yet, but we're trying to work those out and come to a decision soon.

Q I just want to follow up on that. You say that you're going to come to a decision soon;

you want to try to make a decision next week. Did I understand that correctly?

A

We would like to. Whether or not we can depends on whether people can focus their attention on those things.

Q

Can you talk about the funding for that program and how that is reflected in the budget that you sent up to the Hill?

A

There's no funding at this point in the budget that's gone before the Hill. The Air Force had a plan to purchase the aircraft in their Program Objective Memorandum. That is reflected in the out-

something that would be worked out by the external oversight board.

Q

The UAV/UCAV road map—isn't the latest version of that about due now?

A

I saw it as of yesterday—the draft version.

Q

Can you talk about it? How might it affect what you do and how much money may be involved?

A

As you know, we've put a lot of money for UAVs and UCAVs into our budget,

tion element of that joint program should be.

Q

So you may compete the X-45, X-47?

A

We are still working that. We haven't made the final decision on it yet. But we will have a joint program.

Q

Do you have any other details on the UCAV Joint Program Office?

A

No. It's being discussed now, and we haven't [decided] who's going to lead it—I would speculate and project it will be run much like we're running the Joint Strike Fighter Program Office, where there is a lead Service program manager, and the other Services have the acquisition, and then those Services switch.

WE'VE ADDED FUNDING—ABOUT \$1.3 BILLION—FOR THE ARMY'S FUTURE COMBAT SYSTEM. THE ARMY HAS MADE A CONSCIOUS DECISION TO DEFER MODERNIZATION OF SOME OF ITS LEGACY EQUIPMENT IN FAVOR OF INVESTING IN THE FUTURE OF THE ARMY.

years. But as of right now, there is no funding identified in the FY '04 budget. If we decided to proceed, we would have to go in with a reprogramming request and work with the congressional committees to find the funds.

Q

Did DoD actively solicit participation from the privacy groups to be members of the external oversight board, specifically those groups that had expressed serious reservations about the concept of TIA?

A

No. What we've done is form the external group we have—which has the expertise to go look into these issues. How they proceed and how they may hold their hearings—and maybe they would solicit the groups to come and give them their view—that would be

both in Predators and Global Hawks. We are working on a joint program between the Navy and the Air Force for a follow-on UCAV.

All those are still a little bit in the out years. The road map really does lay out what we want to accomplish, shows the programs that we have currently underway, and tries to rationalize a way ahead that avoids duplication. It is really good, but it still needs some coordination work to be done.

Q

So Northrop Grumman hasn't captured the Navy UCAV with X-47—are you going to reopen the competition in that?

A

We are examining what a joint program might look like and what the competi-

Wynne: We had a session on that very thing. And what we want to do, I think, is let DARPA combine the programs, because they're both DARPA programs, and then move toward a first flight or some objective event before we begin to assign it to an Executive Agent or Service. The Joint Strike Fighter—what used to be called the JAST (Joint Advanced Strike Technology), and even a [different] name before that—started out as a DARPA program. And so it is very much similar to that. But we're going to let it mature under the DARPA umbrella, even if it has inter-Service program managers.

Q

Yes, sir. Secretary Rumsfeld told the House Armed Services Committee the other day that if the V-22 [Osprey] doesn't perform satisfactorily during its flight test, it could be cancelled. What's your own assessment of how that program's working? Are you still as skeptical as you've always been?

A

I'm always skeptical until I'm proven otherwise. Their flight test program is laid out very well. They are not skimping on doing hard tests early. They're

testing in that high rate of descent, where the vortex ring state problems exist. They're doing shipboard compatibility testing right now, [which is] another problem where you get different flow fields across the ships and integration with other helicopters. They're working on that.

My trip next week is to go down and assess where they are, how well they have done, what's the plan for the future, and what the reliability looks like in the airplane so far, because they've done a lot of work on that. So my trip next week should give me a little better indication of how they are progressing. I haven't heard any real problems yet, but we'll see after my trip.

Q
Can you talk about the downsizing plans that you have for the AT&L office? And are you transferring functions to the Services, for example?

A
As you may recall, I had a re-engineering plan for AT&L, which includes a reduction in staff by about 15 percent. We're on track to make that happen. Also we're trying to move some elements of AT&L from the management of certain projects back to the Services. I had a listing of those—about \$700 million worth of activities that were joint programs that could be given to the Services for management.

Congress, in their authorization and appropriations bill, has instructed me not to do that.

Q
So you're not transferring that [\$700 million worth of activities]?

A
They have told us that they do not want us to do it, even though they did this before I even asked. It was going to be part of the FY '04 budget. We're going to continue to address that and work with the Congress.

Q
Why are they opposed?



Petty Officer 3rd Class Jerry Lowe, a Navy aviation boatswain's mate, directs an MV-22 Osprey landing on the flight deck of the *USS Essex (LHD 2)*. The Osprey, with its unique tilt rotor design, is again undergoing operational testing designed to evaluate the operational effectiveness and stability of the Osprey for service with the Marine Corps and Air Force. DoD Photo by Navy Petty Officer 3rd Class Jason A. Pylarinos

A
They're concerned that if these joint programs—many of which they provided—moved to a military department, they will be raided to the detriment of the Department and other Services to pay for Service-unique [programs]. And so the result is these [joint] programs will go away in some way or form. They're afraid of that. I think we could fix that, but that's their call.

Q
Under the '04 budget, in the projections, what's the total number of F/A-22s envisioned for the Air Force? And do you think that will ultimately be the number?

A
As I've mentioned before, we have a plan called "buy to budget." As you may recall, last year when we agreed to proceed with the F-22, there was a big debate between the Air Force estimate of F-22 costs and the independent CAIG [Cost Analysis Improvement Group] estimate of about \$7 billion.

We established a program by which we would use the Air Force estimate of cost, but we would only buy the number of airplanes the CAIG says you could buy

at that cost, and that was the "buy to budget." That number was roughly 295, but it permitted the Air Force, if they could in fact achieve cost savings, to buy more, up to the 339 that they would have liked to have had. As this flight test program has proceeded, and the cost of the flight test activities have gone up, we have deliberately moved money from the procurement account to R&D to pay for that. Therefore, the number of aircraft has to drop.

So the number now projected at the estimate of the procurement cost is about 276. But the incentive is still there for the Air Force, as they go out into the future, to invest in cost-savings measures, and we will permit them to buy more aircraft within those cost limitations, if they can do that. But right now, it's around 276, which is affordable—and again, I'm projecting out to the year 2010 now, which is not easy to do, but that's roughly the number.

Q
Assuming the V-22 [Osprey] is able to pass its flight test program, when would the program be returned to a full production status? And is [full production] budgeted for in the out years?

A

There is an increase in the procurement account for the V-22 in the out years, under the assumption that the flight test program is successful. We will have to make the decision on whether or not to continue that production profile probably this summer through the fall, for the FY '05 budget submission that will go next year. So I am very much on top of the flight test program to make sure that so long as it's proceeding in a successful direction, we will continue to do that. If we start seeing some problems occur, we may have to readdress where we go.

Q

Sir, a study called the ISAT 2002 [Information, Science and Technology] study, "Security With Privacy," said, among other things, that DARPA currently has a number of programs in its, quote, "information offices"—meaning Information Processing Technology Office, Information Awareness Office, and Information Exploitation Office—which involve the potential use of information derived from distributed systems, government, and private databases. Aside from the TIA project, which has been widely discussed, what other projects in those three information-related offices raise these type of privacy concerns?

A

I don't think any of them do. A lot of the information technology deals with protection of information from outsiders and computer protection for increasing the bandwidth available to communicate, which has always been a restriction. There's lots of these information technology activities. I am only aware of the one TIA activity that has raised concerns regarding privacy, but TIA is the only program of its kind that I'm aware of.

Q

The Joint Staff has discussed naming an executive agent for the Blue Force Tracking program. [The Blue Force Tracking Program will provide both friendly force tracking and communications and situational awareness to the dismounted soldier or platoon.] Is this something that's on your radar screen yet? And what would you think about it? And how would the Services get the

money? Because my understanding is that the '04 budget doesn't account for that.

A

I'm not familiar with the Joint Staff proposal. I am quite familiar with Blue Force Tracking. I think it's an excellent idea. We don't have enough of it. It has a lot of implications for our ability to have a more effective force and certainly to avoid collateral effects.

Q

Is interoperability a current problem—what are each of the individual Services doing?

A

Absolutely. And I think that's why the Joint Staff is proposing a joint office where we can solve those kind of problems.

Q

The Navy is estimating the cost of CVN-21, the first ship, at \$11.7 billion, including Research and Development. Has that number been reviewed by the CAIG? Is that a CAIG number? And are you comfortable that that ship is going to deliver more than two times the value of a Nimitz class carrier?

A

I haven't seen the numbers. I don't know what fiscal year dollars that [estimate] is for—if it's in year 2018 dollars, it makes a big difference versus the dollars today. I have not seen it. We are going through the process now.

The CVN-21 will come to a DAB for review, and the CAIG, as far as I know, has not reviewed those cost estimates. In fact, we're not even sure exactly all the details of what's going to be in the carrier—the first unit carrier versus the second.

We are very much involved with spiral development of carriers, as well. We don't want to overload the first carrier such that we increase the risk so much that we have to increase its cost even more so. So, the capabilities of what I've seen look very attractive, including not only reducing the manpower, which saved us some money, but also the survivability and effectiveness.

Q

If I might follow up on that question about the ISAT 2002 study, I think this is a study by the DARPA and it does say a number of programs raise these concerns about private databases. Would you have any objection if I were to talk to the heads of these three offices just to sort of go through this? Because I know there's a lot of issues here.

A

I think I would talk to Tony Tether [Director, DARPA] first. I don't object, but Tony Tether—he's the one who puts this all together. I'm not familiar with the study, so I can't comment on the validity of what the study is or is not.

Q

On TIA, is [retired] Admiral [John] Poindexter still a part of TIA?

A

Yes.

Q

And do the reforms you mention mean a reduction in size and scope of what TIA could do?

A

No. What we're talking about is to give myself and the Department of Defense one more degree of confidence that we're doing the right thing with the project. And there are protocols, that if the project technology is successful—a fact yet to be proven—and an agency outside the Department of Defense wants to use it, we've got the right protocols to transfer that [technology]—with all the necessary provisions of privacy, supplemented by the external board, which will also review this—to give us additional confidence that we're doing the right thing.

Q

If Congress gives you the go-ahead, when do you plan to have TIA operational?

A

I don't know when it will be operational. It's a technology project. The FY '04 budget has \$20 million for the TIA project, and I believe in FY '03 we had 10 million. If things proceed in Congress, we'll

be spending the money and determining the feasibility. That has yet to be determined—it's still a technology project.

Q

We face a possible war with Iraq. Now can you talk about some of the resident technologies that are in the field today, that might have some impact on the tactics, techniques, and procedures the U.S. would use to fight a fast and furious war, as the president said? What's out there today?

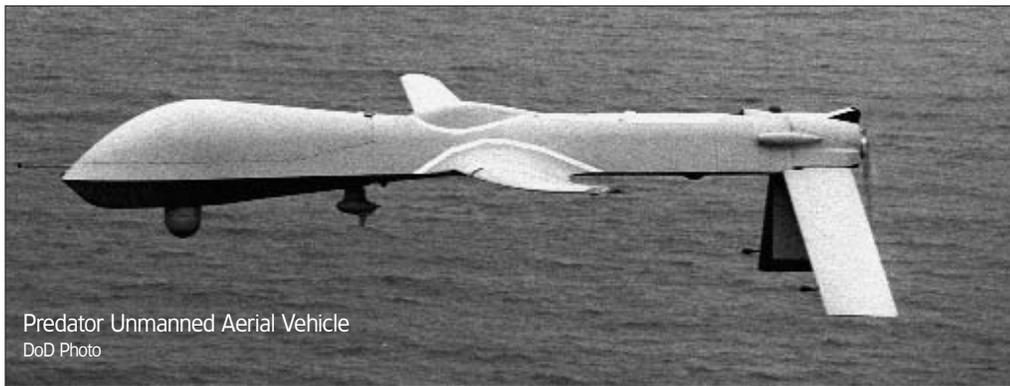
A

Well, I think what you're asking is, what do we have that is transformational today, as opposed to transformational into the future. The transformational communications system, space-based radar—those are transformational for the future. I would say what's transformational today is how we're using the equipment we've got.

Clearly, the Special Forces guy on horseback calling in a B-52 with precision-guided munitions is a transformational way of using forces we currently have. Stealth was transformational before. It's [still around]—we're [still] using it. Bandwidth is increasing the communications system. The integration of these things together, through the COAC [Combined Air Operations Center] that's [located] in Riyadh, Saudi Arabia, and Prince Sultan Air Base—those are transformational.

So the things that we see in the field, like precision munitions, UAVs, stealth technology, long-range strike aircraft, B-52s, even though not transformational, are certainly being used in transformational ways.

The integration of all this stuff—to be able to pull a lot of different systems and lots of information together and go after a target using not only satellites, but JSTARS [Joint Surveillance Target Attack Radar System] and AWACS [Airborne Warning and Control System], P-3s and AC-130 gunships, and Predators—all of that information being consolidated, and then watching the young kids on the chat box in their computers talking—that's transformational.



Q

One of the worst problems in the Gulf War was fratricide. And that's the neutral way of saying killing your own forces accidentally. What progress has been made since the Gulf War on that issue, in the technologies or procedures? There was a BCIS [Battlefield Combat Identification System] that was cancelled a couple years ago that was supposed to solve all that. You indicated some concern about interoperability problems.

A

Well, I'm afraid we haven't solved all of it. We saw the problems with some unfortunate deaths of Canadian soldiers quite recently. And we need to work on it. We are making progress. I'm not sure I can tell you exactly how far we've gone, but we do have some Blue Force Tracking capabilities. We'd like to get more of it. I think combat ID and combat identification is a very good thing for us to do. Progress is slow—we need to make more progress, I would say.

Q

Can you talk a little bit about changes to the B-1? It was built to penetrate, and that seems to not be the case anymore. What does that mean for the bomber fleet?

A

Well, as you know, we had roughly 97 B-1s. We took 33 of them out and used the money to modernize the other ones that were remaining. So we've put improved equipment on them. And as the B-1 ages and our precision weapons systems get developed, we try to adapt the airplane, which has basically now become a truck, to deliver the munition. It's not the airplane that's important—

it's delivering the munition on the target that's important. And the B-1 is quite capable of doing that, but we need to make sure we continue to improve its defensive capabilities against more aggressive threats and to give it survivability by giving it a longer-range munition and things like that.

Q

I'm just wondering if you could tell me whether [retired] Admiral [John] Poindexter will remain in charge of the Total Information Awareness project for the indefinite future; and if so, will his role change in some way by having a board overseeing his activities? And I also wondered if the outside board will have any binding nature to its recommendations?

A

I don't want to get into personalities. And I really don't want to debate the merits of TIA. Let me talk about the board. The board—the internal board—certainly as I will chair it, is focused upon what we in the Department of Defense are doing to make sure that we feel comfortable with this project. It offers one more checkpoint that things are going right and that we have all the restrictions in place, and if we ever do transition that project to another agency, it's done in a proper manner.

The external board, which will be set up under the law—the Federal Advisory Committee Act [FACA]—will be run just like a federal advisory board. In accordance with that, there will be meetings which will be established and public in some cases, unless they get into classified information. There will be opportunities for people to come

UNITED STATES DEPARTMENT OF DEFENSE NEWS RELEASE

Total Information Awareness (TIA) Update

Washington D.C. (Feb. 7, 2003). The Department of Defense will establish two boards to provide oversight of the Total Information Awareness Project, the program designed to develop tools to track terrorists. The two boards, an internal oversight board and an outside advisory committee, will work with the Defense Advanced Research Projects Agency (DARPA), as it continues its research. These boards will help ensure that TIA develops and disseminates its products to track terrorists in a manner consistent with U.S. constitutional law, U.S. statutory law, and American values related to privacy.

The TIA internal oversight board will oversee and monitor the manner in which terrorist tracking tools are transitioned for real-world use. This board will establish policies and procedures for use within DoD of the TIA-developed tools and will establish protocols for transferring these capabilities to entities outside DoD. A primary focus of the board will be to ensure that the TIA-developed tools to track terrorists will be used only in accordance with existing privacy protection laws and policies. The board, which is expected to hold its first meeting by the end of February 2003, will be composed of senior DoD officials.

The outside advisory board will be convened as a federal advisory committee and will comply with all the legal and regulatory requirements for such bodies. The committee will advise the Secretary of Defense on the range of policy and legal issues that are raised by the development and potential application of advanced technology to help identify terrorists before they act.

Members of the outside advisory board are Newton Minow (Chairman), director of the Annenberg Washington Program and Annenberg Professor of Communications Law and Policy at Northwestern University; Floyd Abrams, renowned civil rights attorney; Zöe Baird, president Markle Foundation; Griffin Bell,

former U.S. Attorney General and Court of Appeals judge; Gerhard Casper, president emeritus for Stanford University and Professor of Law; William T. Coleman, Jr., former Secretary of Transportation; and Lloyd Cutler, former White House Counsel.

DARPA is continuing its research into whether advanced technologies can be used to help identify terrorist planning activities. This technology development program was established under the name Total Information Awareness (TIA) and is designed to catch terrorists before they strike. Under the rubric of TIA, DARPA is attempting to develop three categories of tools—language translation, data search and pattern recognition, and advanced collaborative and decision support tools. The research conducted under TIA will provide the tools for obtaining information pertaining to activities of terrorists, and if connected together, this information could alert authorities before terrorists' plans are carried out. While the research to date is promising, TIA is still only a concept.

Development of these anti-terrorism tracking tools would allow the agencies to better execute their missions. TIA does not plan to create a gigantic database. Further, TIA has not ever collected or gathered and is not now collecting or gathering any intelligence information. This is and will continue to be the responsibility of the U.S. foreign intelligence/counterintelligence agencies, which operate under various legal and policy restrictions with congressional oversight. This technology development program in no way alters the authority or responsibility of the intelligence community. Furthermore, TIA has never collected, and has no plan or intent to collect privately held consumer data on U.S. citizens. It is a research program designed to catch terrorists before they strike.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

and talk to the board, to provide their advice.

It will be run just like any other advisory committee, under the chairmanship of Newt Minow, and other people who are named in the press release. All have credentials and expertise in this area. And I think that gives us one other dimension of [checks and balances]. It's external and it will be reporting to the Secretary of Defense—it's advisory to him. I'm sure there are lots of issues regarding privacy and other things that go beyond just what the TIA does; there's issues of how you handle detainees and things of that nature that this board can

in fact advise the Secretary of Defense about.



So he [Poindexter] is still in charge? You weren't suggesting anything other than that?



He is still there. No, I'm not suggesting any changes.



I just wanted to follow up on the 5000-series streamlined acquisition rules. Beyond sort of incorporating or putting more of an emphasis on spiral development and properly funding [programs], is it your inten-

tion with these simpler DoD 5000-series rules to make it easier for non-traditional companies to get into contracting?



Yes, exactly right. What we're trying to do here is that we're trying to tell the program manager in the acquisition community: This is what we want you to do; we want you to be flexible and innovative and responsive, and we want you to streamline the process, but I don't want to tell you how to do that. When you do it, I'm interested in interoperability, I'm interested in safety, I'm interested in properly pricing programs, I'm interested in a

whole series of things—and you'll have copies of this when it's signed—of all the things that we want you to incorporate in your processes that are important to us.

And we lay out in the instruction: Here is a series of milestones. We want you to do Milestone A, Milestone B, Milestone C, and here are some criteria to how you should enter these various milestones. And we're interested in spiral development, and we're interested, again, in proper pricing, we're interested in reducing risk, we're interested in the technology plan.

So it's prescribing what we want you to do, but not the recipe of how to do it. And that's what was happening in the old series—the 250 pages. We were giving them gory details about how to do something, and nobody was reading it. I read something the other day, an article that said, "Well, the new series really doesn't do anything different." And I said, "Well, how do you know? Nobody's ever read it." You have to compare the two to understand the difference.

Q
In the proposed numbers for the fiscal year '04 and '05 budgets, I notice there is a decrease for DISA procurement by several hundred million dollars, and there is an increase by '05 for something like 600 (million) or \$700 million in procurement funds for the OSD. What correlation is there between this shift in numbers? It's almost an equal number.

A
I don't know whether DISA [Defense Information Systems Agency] had bought something in '03, [decided] they weren't buying it in '04, and therefore the numbers went down. Is it for procurement? I just don't know.

Q
It's specific to procurement. And just to follow up on that, an analyst from the Center for Strategic and International Studies surmised that possibly this is related to efforts over the years to centralize buying power in DoD.

A
No. In fact, it's just the opposite. My proposal is to decentralize buying out of the OSD. Our job in OSD is to provide policy and guidance and not to manage programs. And what was happening was, everything that was a joint [program] and they didn't want to give it to the Service, they were giving it to my office, and I was having to manage almost \$2 billion worth of effort a year. We are the wrong people to manage things like that. It needs to get back to people who have the management skills.

Q
As it's currently worded, the Wyden Amendment, if that were adopted, how would that impact the development of TIA?

A
Again, I'm trying to avoid getting into this big debate.

Wynne: We've seen so many versions of it. But what it would do is simply require more reporting to Congress over the activities that are in place now. And I think while we want to share as much as we can with the Congress, especially on this sensitive issue, we really don't think it merits that kind of day-to-day oversight. So what we are trying to do is work with the Congress, in fact, to point out to them that with this kind of resolution, with the inside board and the outside board, we are instituting the kind of oversight that in fact they wanted us to.

Q
You talk about the Navy family of ships. The Navy is trying to push the littoral combat ship, and get it fast as they can. And Ronald O'Rourke and some of the outside analysts have said the Navy has not done the analysis to determine whether this is the proper ship to be doing the kind of missions it's being sent to do. You seem to have signed off on this as a program, and you're normally a little more calculating about requiring analysis on how these things proceed.

A
No. Let me clarify. I don't know what the littoral combat ship looks like ei-

ther, and neither does the Navy. But the concept of a smaller combat ship that you can afford more of, and one better designed to handle the littoral areas—that is a direction which we've all signed up to in the *Defense Planning Guidance* and the *Quadrennial Defense Review* as something that's necessary. We don't want this ship to be so big that we can't buy very many of them. We want them to have a lot of capability. And what it looks like is yet to be determined. That process is ongoing in the Navy, and when we get to the point where we have to enter into Milestone A and Milestone B, we will have all those answers. Otherwise, we can't go into those milestones.

Q
Yes, but if they want to buy the first ship in '05, from a standing start of just months ago, and have the first ones in the fleet in '07—I know you guys are trying to speed things up, but can you do it that fast?

A
I will be a skeptic, again, on this one. It has to be proven to me that we can do it that fast.

Q
The F-22 question: you said very cryptically that if the test program appears to be recovering —[Dov] Zakheim [the DoD Comptroller] alluded to this the other day—what are some of the benchmarks of recovery?

A
What was happening was we didn't have spare parts, and we didn't have airplanes. The test points—we have a drawdown, a number of test points—and you can [drawdown] to where you get to the point where you enter into OT&E (Operational Test and Evaluation). We weren't going down that slope as fast as we would like. They've reenergized it, and now we're coming down that slope faster than we were before. It looks like we can meet the schedule, provided those test points can be flown as rapidly as they say. And it looks like they can.

The other part of it was the avionics package, and that was a question of two things. One is reliability. When you turn

it on, what's the probability it's going to work? And then once they turn it on and it's working, how long does it stay working? Those two are called reliability and basically sustainability or stability. We were having some problems there—the reliability coming on was down, and it didn't run very long before they had to reboot it. And that was causing us some problems in the software package.

Reliability and the stability numbers now seem to be on the rise, which gives us some confidence that the thing will work.



How many more months do you want to see the trend rise before you declare a success?



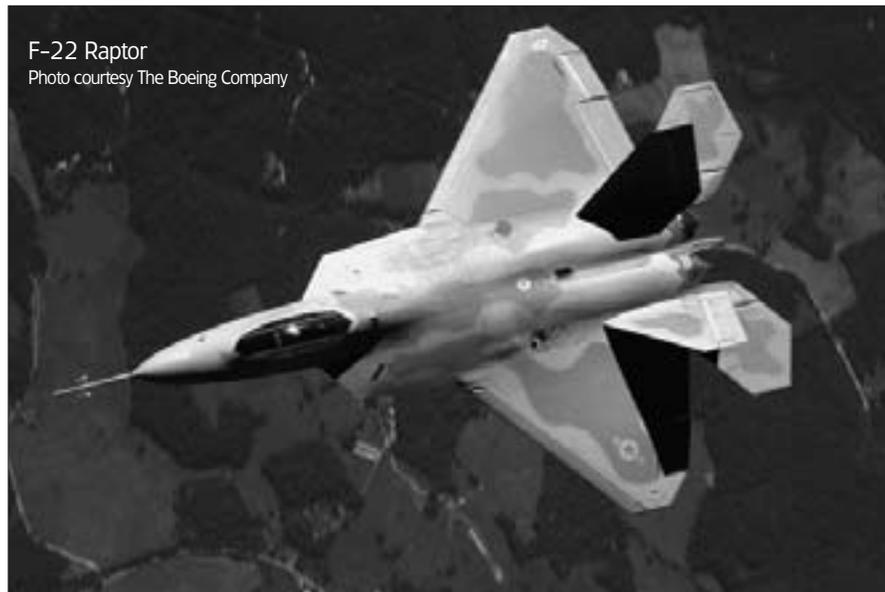
Well, I think the key to that is to have a certain number of points done, and the avionics package stability at a point where we can start operational test and evaluation. That is in the summer period—I'm going to say July/August period. They have to have so many down to where they can enter into it with a production representative airplane to start OT&E.



A question about the Marine Corps in the upcoming '04 budget cycle. There's a big study underway now about expeditionary warfare and forcible entry. The Navy looks like it's made some decisions to delete some research and development funding out of the AAV [Advanced Amphibious Assault Vehicle] program. And you yourself have considerable questions left from the V-22 [Osprey] episode. Does all of this add up to essentially a major review getting underway now of the whole Marine Corps modernization process and where they're headed?



Yes, the study is a review of forcible entry, and that is a question of what do you mean by forcible entry? Does that mean going across the beach? Going over the beach? What does it mean about the equipment carried [by] the



F-22 Raptor
Photo courtesy The Boeing Company

Marine Corps and the Navy to the beach? All of that is under review, and it could, in fact, have an impact upon modernization and the direction we take for the future, very definitely. That's why we have it underway.



I wanted to ask you a question about Joint Strike Fighter costs. One of the benefits of having international partners in the program is that U.S. buys are reduced; foreign buys could offset the price difference that usually comes along with that. The international partners in the program so far have expressed interest in the Air Force STOVL version of the plane, not the Navy's carrier version—the version that's being cut by the Navy at this point. What's the cost effect of that going to be? And does that affect just the Navy or all the Services?



First of all, I have no idea how many airplanes we're going to buy in Joint Strike Fighter in the year 2020, which is when all of this occurs. But the unit cost numbers, in spite of the reduction, are holding the goal we set for ourselves; roughly for the conventional airplane, \$37 million a copy in FY '02 dollars.

The carrier version is a little more expensive because it has to carry more weight and some leading-edge flaps and things like a bigger wing to make sure it can operate with the right attitude. And that number's around \$47 million.

And the STOVL version, strangely enough, is actually less—it's only \$46 million in current estimates.

Those [numbers] are holding. And it is very important that we keep that affordability number. And if we can get any additional international sales in our purchase beyond the roughly 2,600 that we plan for the U.S. and U.K., then those costs will come down even further.



I'm not trying to draw you into a debate, but I'd like to ask the question, can you tell us how much money has been spent, of whatever funds may be available, on this [Total Information Awareness] research and its components so far today?



I can tell you what's in the budget. I can't tell you precisely how much today we've spent. We had \$10 million for this project in FY '03. The project for the president's budget is \$20 million in FY '04.



And the contracts have not been let, or have they been let?



There are some contracts that have been let for people to work on this. I don't know which ones they are.

Thank you all for coming today.



Five New Business Initiatives Approved

The Department of Defense announced today the DoD Business Initiative Council (BIC) approved five initiatives that will improve business practices and processes across the Department.

The approved initiatives focus on various requirements and processes and will positively affect business applications within the DoD. They include:

- Initiate discussions with the Office of Management and Budget and the Congress on revisions to scoring rules on capital leases (e.g., lease to own), so that budget authority and outlays are scored in ways more similar to commercial accounting practices.
- Study successful Share-in-Savings projects and use this research to develop legislative proposals to expand this proven technique.
- Review the joint travel regulations to obtain more parity between civilian and military travel practices and leverage best business practices to obtain volume discounts on commercial lodging.
- Work with the DoD Policy Board on Federal Aviation to improve personnel aspects of the military air traffic control process.
- Propose legislation that permits the full cost of travel to be charged to the appropriation current when the travel begins.

The benefits from the BIC-approved initiatives include streamlined business processes that will enable DoD military and civilian personnel to make better use of their time, the opportunity to avoid unnecessary costs in several functional areas, and the possible return of some Service personnel to deploying units. Several of the proposals require legislation prior to implementation and realization of any efficiencies.

The BIC was launched in July 2001 to implement bureaucracy-reducing and/or money-saving opportunities in the business practices of the Department of Defense, which is core to Secretary Rumsfeld's broader "Battle on Bureaucracy" campaign. The council is presided over by Under Secretary of Defense for Acquisition, Technology and Logistics Edward C. "Pete" Aldridge and is composed of high-level military and civilian personnel.

In approving the latest round of BIC initiatives, Aldridge noted, "the BIC will continue to bring good ideas forward for consideration. For the Department's business processes to improve, leadership must use teamwork and gain continued support and participation from the entire workforce."

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

Modern Acquisition Myths

One Size Does Not Fit All

CAPT. DAN WARD, USAF

You have probably heard the ancient story of Icarus and Daedalus—how they built wings with feathers and wax to escape the Labyrinth and how Icarus ignored his father's warning about flying too high. Everyone knows that story is a myth.

You have probably heard the following six stories too. The difference is, some people believe these stories are true—and that can lead to serious trouble. Like the feathers in Icarus' wings, the Acquisition Myths described here will ultimately fail to support you as you fly toward your goal.

1 THE MYTH OF THE METHOD: "ONE SIZE FITS ALL."

First there was Scientific Management. Later, we had Management by Objectives (MBO), Total Quality Management (TQM), Management By Walking Around (MBWA), The Revolution In Military Affairs, Acquisition Reform, and a host of others. Each method had its particular strengths, and each was rejected, or even vilified, when a new school of thought entered the arena. Today the hot topics include Spiral Acquisition and Agile Acquisition. Tomorrow is sure to bring something new.

For some strange reason, some people tend to get on the TQM/MBO/MBWA/Spiral/etc., bandwagon and become con-

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vinced that it will work in every situation, despite the fact that *none of our previous methods were foolproof or flawless*. We humans are hardwired to look for patterns, so why we continue to miss this pattern is a mystery.

The truth is no particular method is appropriate for every conceivable situation, program, or enterprise. To put it

plainly, one size does not fit all. These management methods can be useful and effective tools when applied to the situation they were designed to address, but they quickly become useless or counterproductive when misapplied—and it's not hard to misapply them. When we believe we've got the perfect method, it becomes a box instead of a guide, and we start doing things because

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COMMUNITY. HIS
DEATH IS A
METAPHOR FOR THE
DANGER OF PRIDE—
HE TRUSTED HIS
OWN JUDGMENT
AND FLEW TOO
CLOSE TO THE SUN.
IT WASN'T
EXUBERANCE OR
CARELESSNESS THAT
BROUGHT ICARUS
DOWN. IT WAS
ARROGANCE.**

“we're following the method” as opposed to “because it helps us reach our goals.” This also transfers responsibility for failure away from the individual and onto the method. If I'm doing it by the book and something goes wrong, it must be the book's fault!

That is not to say *methods* are a waste of time. Some of them are quite good. But none of them are perfectly suited for every situation—and none ever will be. A hammer is a wonderful tool, unless you need to cut wood. For that, you'll want a saw.

How to proceed? Keep in mind that any method, formula, or process has its strengths and weaknesses. Avoid taking a broad-brush approach to your development efforts, and don't be too quick to latch onto the latest management fad.

**2
THE MYTH OF THE
INTERIM SOLUTION:
“THIS SYSTEM WON'T LAST LONG.”**

Belief in the Myth of the Interim Solution can be dangerous and needlessly expensive in the long run. It can lead a Program Manager to take shortcuts and make decisions that negatively impact the user, because “it is only an interim solution. We'll do the heavy lifting later.” The reality is, if something works, it tends to stick around.

I once worked on a program that actually had the word “interim” in its name. That was several years ago, and as far as I know *it is still in use*. The problem was, the darned thing worked! It met the user's need, inexpensively and simply—so developing the real solution was put off and its funding was diverted elsewhere. Fortunately, we did it right the first time, and our stop-gap capability became a real asset. The truth is, it wasn't a problem at all—other than the fact that we were still calling it an interim solution.

How to proceed? Gold-plating every system is not the answer. Some systems are truly temporary and disposable—just not very many of them. Program Managers and designers need to keep in



MYTH vs. REALITY

- | | |
|---------------------------------------|--|
| 1. One size fits all. | 1. Different situations require different tools. |
| 2. This system won't last long. | 2. If it works, it stays. |
| 3. Requirements creep is bad. | 3. Requirements creep is inevitable and good. Plan for it. |
| 4. We Know the Concept of Operations. | 4. Users are creative and innovative. |
| 5. Development is for the pro's. | 5. Hobby shops can provide excellent systems. |
| 6. We can learn from experience. | 6. We seldom see the long-term results of our actions. |

mind that a system's lifespan will most likely exceed our expectations. We need to be cautious about cutting corners and taking a "we'll fix it later" attitude. In a "pay me now or pay me later" scenario, the upfront payment is often significantly smaller than the bill you'll receive down the road. In other words, it's usually better and cheaper to do it right the first time than to do it over.

The point is, systems sometimes remain operational longer than the developers expect. Just look at the 40-year-old B-52, which is projected to remain in operation until 2037 (or longer?). I wonder how its development might have been different (and how much money could have been saved) if we'd suspected how long it would last.

3

THE MYTH OF REQUIREMENTS CREEP: "REQUIREMENTS CREEP IS BAD AND AVOIDABLE."

Some acquisition programs manage to avoid any significant requirements creep through a variety of approaches. Not that they *should*, but some do.

Here is why a little "creep" is a good thing. As a development program evolves, technology advances—often in unexpected ways. The more time developers spend with users, the better we understand their needs, wants, and expectations. That combination—in-

creased understanding and improved technology—often leads to the conclusion that the system's requirements need to be changed or expanded. That is not a bad thing, and it shouldn't come as a surprise.

This type of requirements creep is therefore largely unavoidable and highly appropriate. If both technology and our understanding of users needs improve over time, it makes sense to count on and plan for the inevitable expansion of system requirements. Problems arise when users recognize the need to expand or change the requirements, while the developer remains focused on the original baseline. Another problem surfaces when new requirements are added without a corresponding increase in funding. These problems are largely self-inflicted and essentially avoidable.

The Spiral Acquisition model is well suited to solve these problems, and it does so admirably. Users receive new capabilities sooner than in a traditional approach, and as technology develops, they receive incremental improvements to the capabilities. Ideas that once would have been labeled requirements creep now can be folded into future spirals.

How to proceed? Rather than fighting requirements creep or seeing it as a necessary evil, PMs should smile and include it in their original plans, budgets, and schedules. The Spiral Acquisition

model, while not suited for all situations (see Myth No.1), gives planners, developers, and managers a flexible road map for such planning. Remember, it is only requirements creep if we didn't see it coming, and there is no good reason to be caught off guard.

4

THE MYTH OF THE CONOPS: "WE KNOW HOW THE SYSTEM WILL BE USED."

While painting my living room walls recently, I used a flathead screwdriver to pry the lid off the paint can. When I was done, I used the butt end of the screwdriver to pound the lid back on. Prying and pounding are outside the scope of a traditional screwdriver CONOPS [concept of operations], and those are not the activities I had in mind when I bought the screwdriver. Still, it got the job done quite nicely, and I don't think I'm the only screwdriver operator who uses it that way.

Warfighters are famous for taking a similar approach to their tools. No matter how experienced, educated, or intuitive a PM might be, we can seldom foresee all the ways our systems will be used and changed after they are deployed. New situations arise unforeseen, and innovative people play with the equipment and make it do new things. Before long, the original CONOPS becomes at best incomplete and at worst obsolete. For example, the American fighter jets still fly, but these days they spend a lot more time doing air-to-ground missions than engaging in actual dogfights with enemy fighter jets. I'm not sure that was the original plan, but there's nothing wrong with that. It is better to have an obsolete CONOPS and a new capability than a solid, unchangeable CONOPS and no innovation.

How to proceed? Aim to produce systems that are adaptable, flexible, scalable, reusable, modular, and interoperable. Keep in mind that users are creative. We don't always know everything about how they use today's systems, let alone how they might use tomorrow's. When you're defining the specs and requirements for the next gen-

eration screwdriver, try to ensure it won't accidentally lose any "non-spec" capabilities (like opening paint cans). Ever try prying open a can with a Phillips head screwdriver? Sometimes losing a capability like that can be an acceptable trade-off. Nevertheless, it should be an *intentional* trade-off, made with the full knowledge (and preferably the buy-in) of the users.

5

**THE MYTH OF HOBBY SHOPS:
"ONLY 'PROFESSIONALS'
SHOULD DEVELOP SYSTEMS."**

At a recent gathering of military acquisition professionals, someone bemoaned the fact that "hobby shops" are "[providing] near-term solutions with no integration, and the folks who own those 'hobby shops' are reluctant to yield any control [over the system]... because they work." It is interesting that anyone would complain about small groups of people providing systems that work. It is even more interesting that the proposed solution is to hand control over to a second party, who probably has less knowledge about the mission need, the system, and the CONOPS than the original hobby shoppers.

The truth is users and other amateur developers are sometimes able to create systems that work quite nicely thank you very much, and they often do it faster and cheaper than anyone else. They may not know their EVM [Earned Value Management] from a hole in the ground, but they know what their operational requirements are. The problem is their solutions might be too tailored to their own situation, so the rest of us miss out on sharing their accomplishment. Their lack of development experience might cause them to make mistakes that a Level III acquisition professional wouldn't. This is exactly where the professionals should come in. Rather than trying to wrest control away from successful amateurs, we should come alongside them and share our professional expertise. There is a word for that type of behavior—teamwork.

How to proceed? As Chief of Staff of the Air Force Gen. John Jumper recently

pointed out, "there needs to be oversight and standards, not standardization." In other words, standards are tremendously useful and important, but standardization misses the point. Integration is often a vital requirement, except when it isn't. What we often lack is not external control over hobby shops, but clearly defined and well-understood standards. The professional acquisition community should let the hobby shoppers keep doing their thing—dreaming up and developing systems that work. Our job should be to join their teams and help them understand that wax melts if they fly too close to the sun, and feathers get heavy if they fly too close to the sea. Maybe they could try using aluminum.

6

**THE MYTH OF LEARNING
FROM EXPERIENCE:
"WE DIRECTLY EXPERIENCE
OR OBSERVE THE
CONSEQUENCES OF OUR ACTIONS."**

Experience is an excellent teacher—perhaps the best teacher around. That doesn't mean we always learn the right things under its guidance. In today's defense acquisition environment, we often have five-year development programs managed by people on two-year assignments, spending one-year money. Military personnel like myself, often can't stick around long enough to observe firsthand the long-term outcomes of our decisions. Experience is an excellent teacher, but it is hard to learn from experience if you're not there.

Peter Senge made this same point in his book *The Fifth Discipline*. As he explains what he calls "the delusion of learning from experience," he points out that we do not directly experience the long-term consequences of many of our most important decisions. Cause and effect are not closely related in time and space, making it nearly impossible to draw proper conclusions and learn proper lessons. He also points out that many of today's problems come from yesterday's "solutions." Why? Those solutions are often based on things we think we learned from experience. We are learning from experience all right, but some-

times we're learning the wrong lessons because our experiences are not always what we think they are.

How to proceed? We can learn from other people's experiences, we can study history, and we can seek out the decisions and actions of past years, watching for causal relationships with today's lessons and challenges. We should also recognize the role that intuition, insight, introspection, and innovational urges can play. Remember, it is very difficult to directly observe all the implications of our own actions. For that reason, it is important to cast a jaded eye on the short-term conclusions we are tempted to draw. Keep in mind that the final chapter has yet to be written.

Acknowledging Our Limitations

Whether or not Icarus actually plunged into the Mediterranean Sea one sunny day, his story has an important lesson for today's acquisition community. His death is a metaphor for the danger of pride—he trusted his own judgment instead of listening to his father's wise counsel. He flew too close to the sun. It wasn't exuberance or carelessness that brought Icarus down. It was arrogance. And arrogance lies at the core of these six myths as well.

If we want to avoid sharing Icarus' fate, we need to steer clear of his flight path. In contrast to the myths described here, the truth is we have not discovered the perfect management or acquisition method, and we never will. We do not know everything about how our systems will be used or how long they will last. We have not defined all our requirements perfectly up-front, and we do not directly experience the consequences of some of our most important decisions. We may be highly educated and highly experienced, but we are also highly human. If we're not humble enough to acknowledge our limitations and smart enough to act accordingly, we will probably end up all wet, just like Icarus.

Editor's Note: The author welcomes questions or comments on this article. Contact Ward at WardD@nima.mil.

Pentagon Plans Heavy Investment in UAV Development

SGT. 1ST CLASS DOUG SAMPLE, USA

WASHINGTON, March 18, 2003—The Defense Department today unveiled a billion dollar roadmap for Unmanned Aerial Vehicles (UAVs) during the next 25 years. Plans call for developing joint interoperable UAVs that are capable of everything from surveillance to air strike.

“The roadmap provides those high-priority investments necessary to move UAV capability to the mainstream,” said Dyke Weatherington, Deputy of the UAV Planning Task Force in the Office of the Secretary of Defense, at a DoD press briefing today. “The potential value UAVs offer ranges across virtually every mission area and capability of interest to DoD. The roadmap identifies those key technology areas that we think are right for investment.”

The Pentagon has made UAV weapon systems a priority. Defense Secretary Donald Rumsfeld, who strongly supports the UAV program, has pushed UAVs as one way to transform the military.

Today, about 90 UAVs support military operations around the world, and the Department has them standing by for potential use over Iraq.

By 2010, according to the roadmap report, DoD hopes to increase its UAV inventory to about 350. And the Department plans to increase that to more than a thousand in the outyears, according to Weatherington.



Deputy for the Unmanned Aerial Vehicles Planning Task Force, Office of the Secretary of Defense, Dyke Weatherington briefs reporters on the UAV Roadmap report during a Pentagon press conference on March 18, 2003. The UAV Roadmap outlines development of unmanned aircraft for the next 25 years.

DoD photo by Helene C. Stikkel



Predator Unmanned Aerial Vehicle
DoD Photo

From 1991 to 1999 the Pentagon invested about \$3 billion in UAV projects. That is projected to rise to \$10 billion from today through 2010, according to the latest *DoD Unmanned Aerial Vehicles Roadmap 2002-2027* report.

The Air Force's Predator UAV proved its military capability flying reconnaissance missions in Bosnia, and was credited with taking out one of Al Qaeda's top lieutenants in Afghanistan with a Hellfire missile.

Besides Predator, the military services are developing other UAV platforms. For example, the Air Force has another UAV called Global Hawk. The system is completely computer-operated and can be used for long-term surveillance. The high-flying Global Hawk currently carries photo reconnaissance equipment, but production versions of the system will carry electronic intelligence gathering materials. The Global Hawk can stay airborne for 32 hours.

The Army has developed the Shadow 200 tactical UAV. The Army also has the Hunter UAV, and both are primary surveillance UAVs and relay video in real time.

Meanwhile, the Marine Corps has developed Dragon Eye, a small, hand-launched UAV that can give leaders a snapshot of the battlefield, and it plans to make improvements to the Pioneer UAV developed by the Navy. The Pioneer was used in the 1991 Gulf War.

The Navy is developing Neptune, which can drop small payloads and the X-46/X-47, a large autonomous unmanned combat aerial vehicle that has a 34-foot wingspan. The system will be initially built for tactical surveillance, but the Navy envisions it one day becoming a strike system.

Weatherington said that UAVs offer a unique advantage for military leaders because they can conduct dangerous missions without the risk of human life. UAVs will soon have the capability for reconnaissance in areas possibly contaminated with biological or chemical agents or suppress enemy air defenses, or provide deep strike interdiction, he said.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

The Reliability Analysis Center

A Program Manager's Resource

NED CRISCIMAGNA

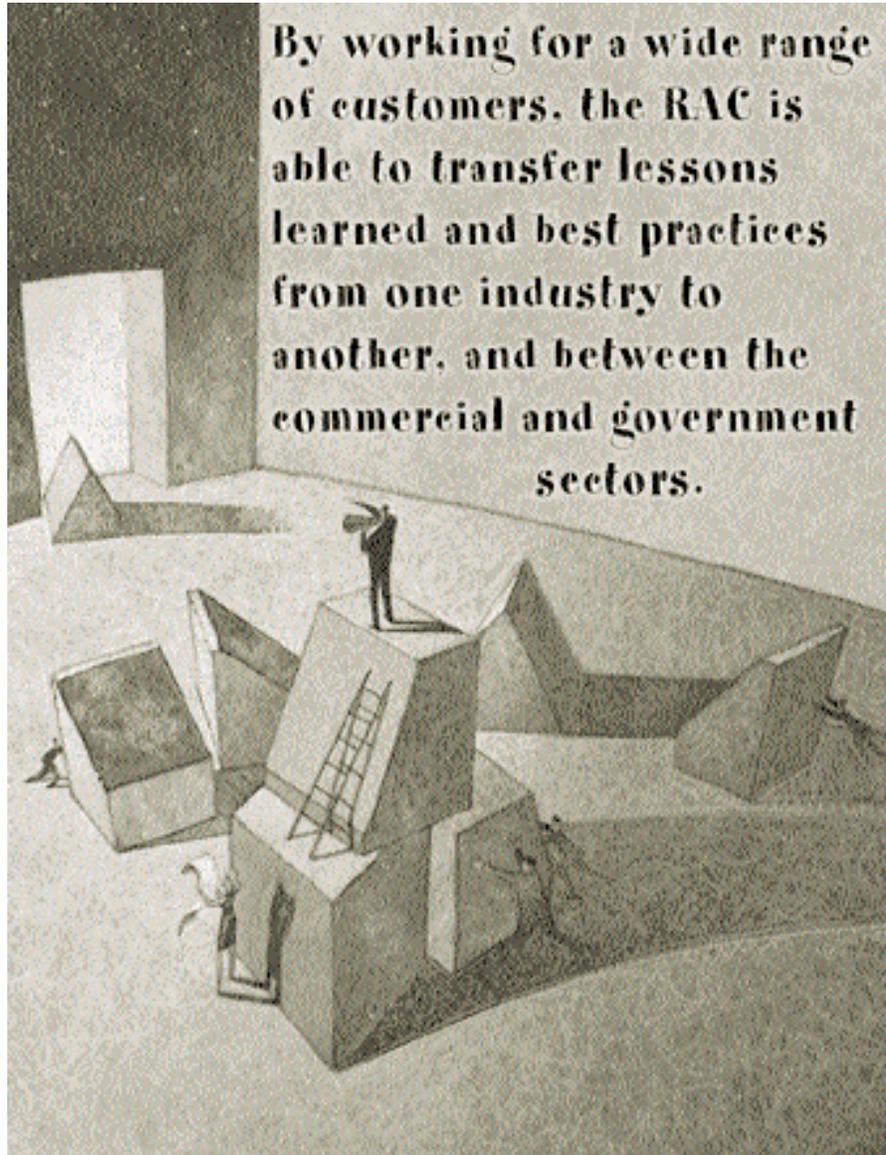
The Reliability Analysis Center (RAC) provides reliability, maintainability, quality, and supportability (RMQS) resources and services to program managers, the Department of Defense, the military services, other government agencies, and industry. The RAC is one of 13 Information Analysis Centers (IAC) sponsored by the Defense Technical Information Center (DTIC). The RAC, and indeed the IAC program as a whole, can help program and project managers:

- Cope when short-staffed.
- Analyze large quantities of available information in a particular subject area.
- Ensure that any previous research is considered in their system design.
- Find information from analogous systems for their new systems.
- Search for applicable, and establish contact with, leading researchers and scientists in a particular field.

The RAC facilitates the cost-effective implementation of RMQS throughout all phases of a product's or system's life cycle.

Support for Program Managers and Military Acquisition

RAC provides support to the defense acquisition community in general, and program managers specifically. Since its creation in 1968, the RAC has worked for a wide range of organizations in the public and private sectors. Our work for acquisition programs includes developing reliability programs, conducting selective reliability analyses, developing traditional reliability and ac-



By working for a wide range of customers, the RAC is able to transfer lessons learned and best practices from one industry to another, and between the commercial and government sectors.

celerated life tests, witnessing testing on behalf of the government, developing requests for proposals, and assisting in source selection.

For fielded systems, the RAC focuses on improving the availability of fielded sys-

tems. These projects include working with the Navy Depots to improve their overhaul process; with the U.S. Army Power Reliability Program to increase the availability of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance

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facilities; and with the U.S. Air Force Warner Robbins Air Logistics Center to improve the readiness of electronic countermeasure pods.

By working for a wide range of customers, the RAC is able to transfer lessons learned and best practices from one industry to another, and between the commercial and government sectors.

How does the RAC support program offices? Here are just a few examples.

- A Navy program office program analyst needs information on environmental stress screening for a cost-benefit analysis. She calls the RAC. Within a few hours, she has the necessary information—and at no cost.
- A logistics engineer in an Army program office is looking for commonly used and new methods for predicting basic system reliability. He sends an e-mail to the RAC and receives a reply with the information by the end of the day.
- A logistics analyst with an Air Force Program Office is trying to find a standard factor by which to reduce a contractor's failure rate predictions that will be used to determine how many initial spares should be purchased. He faxes his inquiry to the RAC and is called the next morning by the RAC engineer who gives him the answer to his question.
- A program office needs support to evaluate a reliability growth test proposed by the prime contractor and to monitor the management of the growth process. Lacking the experienced staff to do these long-term tasks, the program office quickly gets the RAC to work without going through the competitive contract process.

The Reliability Analysis Center is an IAC

The RAC is an Information Analysis Center (IAC). The IACs are government organizations regulated by DoD Directive 3200.12; DoD Scientific Technical Information (STI) Program, dated Feb. 11, 1998; and DoD Instruction 3200.14, Principles and Operational Pa-

rameters of the DoD Scientific and Technical Information Program, dated May 23, 1997. The Office of the Secretary of Defense, Director of Defense Research and Engineering provides policy oversight of the IACs. Administrative and operational management is provided through the Defense Information Systems Agency by the Defense Technical Information Center (ATTN: DTIC-AI), 8725 John J. Kingman Road, Ste. 0944, Fort Belvoir, VA 22060-6218. Appointed Contracting Officer Technical Representatives (COTRs) from technical host organizations provide technical management for the IACs.

A primary customer of the RAC and all the IACs is the military acquisition program manager. IACs have scientists, engineers, and information specialists experienced in specific technical areas to help program offices locate, analyze, and use STI. The IAC staffs establish and maintain comprehensive knowledge bases, including historical, technical, scientific, and other information collected throughout the world and pertinent to their respective technical communities. They also collect, maintain, and develop analytical tools and techniques, including databases, models, and simulations. Program and project managers can capitalize on the specific skills of their staff and maximize their tight budgets by calling on the unique and specialized skills of the IACs. The IACs can provide managers with affordable short- and long-term technical services.

The RAC provides technical expertise and information in the engineering disciplines of RMQS and facilitates their cost-effective implementation throughout all phases of the product or system life cycle. Reliability is an aspect of system performance that affects mission success, system availability and readiness, support costs, mobility, and system effectiveness. Designing for maintainability ensures that systems can be safely, economically, and efficiently kept in operating condition.

Quality is and has long been an important aspect of manufacturing, installa-

tion, and other processes. Supportability considers the overall infrastructure, resources, and investment needed to support a system over its operational life.

The RAC is operated by Alion Science & Technology and is located in Rome, N.Y. Patrick Hetherington is the RAC Director. The COTR for the RAC is Richard Hyle, who is with the Air Force Research Laboratory, Information Directorate in Rome, N.Y.

A Steering Committee with voting members from the military services and from DoD provides guidance to the RAC. George Desiderio, Deputy Director, Systems Engineering, Office of the Under Secretary of Defense (Acquisition, Technology and Logistics/Interoperability) is the Chair of the Steering Committee.

The RAC Supports the Program Manager in Many Ways

At the beginning of this article, we listed ways in which the RAC supports Program Offices and Program Managers. The examples given generally fall into two categories: technical support and consulting services.

Technical Support

Program managers have free access to eight hours of technical support. Technical solutions may be only a telephone call or e-mail message away. To provide quick, accurate answers we call on our staff or extended expert network, conduct bibliographic searches of our more than 70,000 references in the Reliability Analysis Center library, and draw upon our experience and other technical sources.

Consulting Services

For more extensive technical needs that go beyond our free technical support, program managers can quickly, without the need for a competitive award, get the RAC working as a member of the program office team. When a more detailed answer than can be provided using the RAC's Inquiry Services is needed, RAC can supply both short- and long-term consulting help (on-site when necessary) to satisfy your needs.

In addition to technical support and consulting services, the RAC provides three other key services.

Training Services

RAC presents training courses in virtually all aspects of reliability, maintainability, and quality in both open registration and on-site formats. Courses can be tailored to meet specific user requirements. Courses stress proven approaches and techniques for the designer, analyst, and manager. The RAC teaches about 1,000 public and private sector students each year.

Publications and Tools

RAC offers more than 50 authoritative publications on reliability, maintainability, quality, and supportability as well as software tools to help you design, build, and support effective systems and products. The RAC develops a wide variety of publications in the following categories:

- Analysis and Application Guides
- Commercial Practices
- Data Books
- Quality Improvement
- Reliable Application of Components
- Software Products.

The RAC develops these products leveraging the experience and knowledge that its staff gains in conducting a wide range of projects for our government and industry clients.

Current Awareness

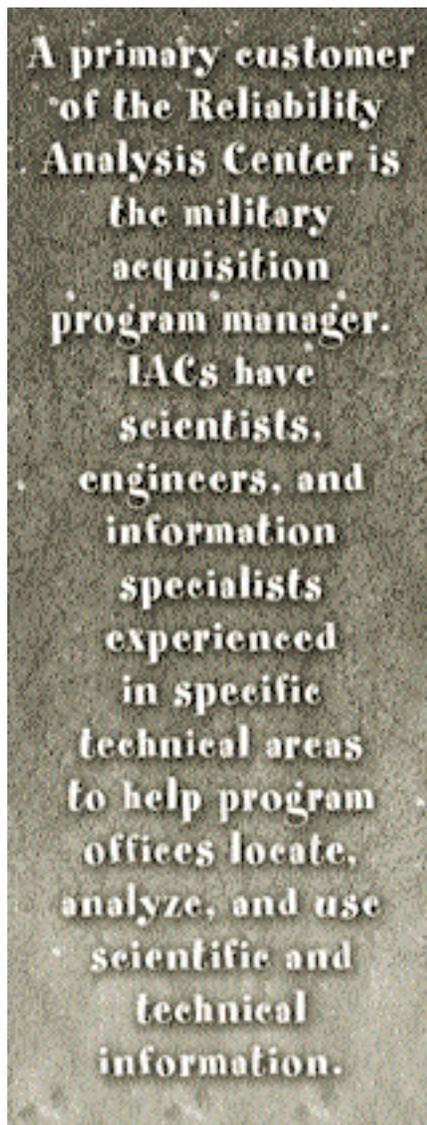
The RAC can help the technical staff of a program office to stay abreast of the latest news, advances in reliability, and the other assurance disciplines.

RAC JOURNAL

The RAC publishes a free quarterly technical journal containing articles covering engineering advances, policy and standards activities, technology applications, and upcoming events. The focus is on practical knowledge that can be applied to improve RMQS.

START Fact Sheet

The RAC publishes a series of Fact Sheets, available at no charge, entitled



Selected Topics in Assurance Related Technologies (START) intended to “start” the reader's knowledge in a specific technical subject area.

World Wide Web Access

Users can obtain information on related Web sites (including training, software tools, standards, etc.), conduct online searches of the RAC library, download free copies of the *RAC Journal* and *START* Fact Sheets, check the Calendar of Events, access useful tools free of charge, and order products.

Program Managers Have Access to RAC Resources

The RAC has more than 60 engineers and technical staff members to support its clients. In addition to our strong tech-

nical staff, we have access to more than 1,700 other technical staff members.

Subject Matter Experts

The RAC has a network of subject matter experts (SMEs) to supplement its own staff. In nearly all cases, subject matter experts provide a response gratis. Our SMEs include individuals from academia (e.g., Penn State and Rutgers), industry (e.g., ReliaSoft and JBF), and consulting (e.g., Wayne Nelson for accelerated life testing).

Data

RAC is a worldwide renowned source of reliability data. It maintains extensive quantitative and qualitative databases on components, assemblies and, most recently, systems, and makes the data available through several data products. Data is collected from numerous industry and government test and field sources and is updated on a continual basis.

The RAC created and manages the Data Sharing Consortium (DSC). The DSC compiles and disseminates data on parts and systems, and is open to all commercial, U.S. Government, and foreign organizations. By sharing data, DSC members save costs from the reduction and elimination of redundant testing, and have access to a larger base of data with which to evaluate the quality and reliability of parts and systems. Types of data contained in the DSC include screening, qualification, failure analysis, and field performance of components and systems.

Library

The RAC maintains a complete library that includes articles, books, journals, reports, and other technical documents dealing with RMQS topics. Many of these documents are in electronic format making searches and information retrieval quick and accurate. Our librarian ensures that an abstract, complete with key words, is entered into our library database for each document entered in the library.

An online feature allows visitors to the RAC Web site to search the library using

a concept or key word. The Reliability Analysis Center will only distribute copies of documents for which we hold the copyright, in accordance with copyright laws. In general, search results for RAC publications will indicate RAC as the “performing/publishing agency” or the “source.” These RAC products can be ordered from the RAC.

Putting the RAC to Work for You

For government clients, the process of putting the RAC to work is a straightforward and quick process. First, customers write a task white paper with RAC assistance. Then, the statement of work is sent to our COTR, who ensures

that the work is within the scope of the RAC charter, and prepares a Work Plan and Statement of Work (SOW). After the Work Plan and SOW have been finalized and approved, the RAC sends a technical and cost proposal to the customer. When all parties are satisfied with the SOW and technical and cost proposal, the customer issues a Military Interagency Purchase Request and the RAC starts work.

34 Years of Success

The RAC serves the RMQS communities with a wide range of products and services backed by 34 years of experience and successful work. Like all the

IACs, the RAC was established first and foremost to serve the needs of Department of Defense and military organizations. Program managers can especially benefit from the RAC because we are attuned to defense acquisition issues and concerns, can be placed on contract quickly and efficiently, and have worked on improving the reliability, availability, and readiness of many weapon systems.

Editor's Note: The author welcomes comments on this article. Contact him at NCriscimagna@alionscience.com. For more information on the RAC, go to <http://rac.alionscience.com>.

DAU SOUTH REGION GAINS NEW STRATEGIC PARTNERS

To extend its educational strategic partnerships and leverage increased learning opportunities, the Defense Acquisition University (DAU) South Region signed Memorandums of Understanding with Drake State Technical College and Oakwood College; and Letters of Intent with Grambling State University, Tuskegee University, and Bethune-Cookman College. The sign-

ing ceremony was held at the DAU South campus, located in Huntsville, Ala., on Jan. 28, 2003.

For more information on DAU South Region Strategic Partnerships, contact Dr. Jerry Davis, Associate Dean, Outreach and Performance Support, DAU South Region, at jerry.davis@dau.mil. For more information on the DAU South Region, visit the DAU Web site at <http://www.dau.mil>.



Standing from left: Dr. Legand Burge, Dean, College of Engineering Technology and Computer Sciences, Tuskegee University; Dr. Aubrey Long, Chairman, Division of Business Administration, Bethune-Cookman College; James McCullough, Dean, DAU South Region; Dr. Helen McAlpine, President, Drake State Technical College; Hank Valentine, CEO, Histori-

cally Black Colleges & Universities and Minority Institutions; Dr. Delbert Baker, President, Oakwood College; Dr. Obadiah Simmons, Dean, Continuing Education and Special Programs, Grambling State University; and Army Col. Ronald Flom, DAU Commandant.

Photo by Donald Clark

Advanced Technologies Program Is on the Battlefield

JIM GARAMONE

WASHINGTON, March 18, 2003—U.S. military planners cannot allow chemical or biological attacks to stop operations.

Two Advanced Concept Technology Demonstrations (ACTDs) are helping combatant commanders continue their missions in the face of chemical and biological threats.

The Restoration of Operations (RESTOP) ACTD and the contamination avoidance at seaports of debarkation ACTD are projects that find technologies to help keep airports and seaports open.

"If a base gets 'slimed,' operations still must continue," said Cindy Maclellan Wilson, the ACTD oversight executive for the two projects.

If an enemy uses chemical or biological weapons in a combat environment against a maneuver force, units can avoid or go around the contaminated area. That isn't possible with an airport or seaport. They are fixed and the facilities to unload planes and ships cannot be quickly duplicated elsewhere.

The ACTDs look at ways to alleviate the problem, better ways to quickly decontaminate areas, new procedures and concepts of operations, and new equipment to allow servicemembers to continue operations.

The RESTOPS project started in 2000. The idea was to restore operations on airfields quickly. The Defense Threat Reduction Agency and U.S. Pacific Command sponsored the effort.

"Chemical-biological situations are one of the hardest problems we try to handle," Wilson said. "We took a look at what concepts of operations and tactics, techniques, and procedures were being used and what was still needed."

The group conducted a technology call and received more than 170 technologies. The sponsors held field trials at the Army's Dugway Proving Ground, Utah, and selected 14 technologies and five concepts of operations they wanted to test.

"Before the ACTDs started, if you were subjected to a chemical or biological attack, that was the end game—the mission degradation was significant," Wilson said. "If we can keep moving at all, that's an improvement."

She said that unlike large acquisition programs, ACTDs often don't have hard numerical measures of effectiveness. "Commanders know, however, if something improves their effectiveness," she said.

With RESTOPS, one of the measures was sortie generation. "If your air base is contaminated, how do you keep your aircraft moving personnel and moving equipment?" she asked. "You know what your standard operating tempo is, so we said, 'let's minimize degradation as much as possible.'"

The ACTD included equipment, warning technologies, decontamination technologies, medical equipment, and personnel protection. Portions of the ACTD are being rushed to the Persian Gulf.

"One that appears to be extremely successful is the SAFE kit—Small Area Filtration Equipment," Wilson said. "These help you get fresh, clean air into a room that would otherwise be contaminated."

"It's a popular problem right now since everyone is going out and buying their duct tape and plastic sheeting," she said. "That's actually the militarily approved way to seal a room. If you've got a room that you need personnel working in, we cover up the vents, cover up the windows, then in the doorway

we put in a SAFE kit. This is a filtration system that seals into the doorway. It lets you get fresh, filtered air rather than getting carbon dioxide poisoning or being contaminated by chemical or biological agents.”

Another technology that has proved useful is the mobile chemical agent detector. This is a vehicle-mounted detection system that can detect agent vapors moving through an area. It can triangulate to identify chemical agent location and type.

Another useful tool is the RESTOPS information management system. “Basically it’s a plug-and-play in your command-and-control system for use in a biological or chemical situation,” Wilson said. “It helps show which areas of the base are contaminated, and commanders can move troops and resources as needed to protect or decontaminate them.”

Prior to this system, she said, commanders relied upon grease pencils, maps, and word of mouth to allow them to identify contaminated from uncontaminated areas of the base and advise their troops.

Some things don’t make the cut, which allows defense officials to redirect acquisition efforts and resources to more promising areas.

Officials tested RESTOPS technologies and procedures at Osan Air Base, South Korea, in February 2003. Some preliminary results have already been shared with the combatant commanders.

The time spent on RESTOPS gave the ACTD focused on seaports a leg up, Wilson said. The Contamination Avoidance at Seaports of Debarkation [CASPOD] ACTD had a 2002 start and is sponsored by U.S. Central Command.

“RESTOPS conducted a data survey its first year and looked at existing studies,” she said. That work was easily transferred to CASPOD. “Because of the groundwork, CASPOD was able to hit the ground running.”

Officials did a quick tabletop exercise in 2002 and were able to put together commercial off-the-shelf technologies quickly. Wilson received a Central Command memo saying that the flyaway capability CASPOD demonstrated had “significant military utility.” The command asked for additional money for the capabilities now and recommended the program for the other combatant commanders, she said.

Wilson said DoD sent the command the extra money so they could immediately purchase the theater chemical/biological response package. “It will be sent to the field shortly,” she noted. The package is protection suits, test kits, personnel safety equipment, detection strips, and special types of waste pumps to handle contamination.

The two projects also put thought into cross-contamination.

“What do you do if an airport is slimed and an aircraft is landing with equipment you need now?” she asked. “Can you land it? Once it’s landed, who’s going to touch the aircraft to off-load it? How do you ensure the equipment inside the aircraft hasn’t been contaminated? Is your runway now contaminated because you have this dirty aircraft on it?”

Seaports have to deal with similar problems and then some. Usually, DoD hires local stevedores to offload ships. “What’s their protection [from chemical and biological attacks]?” she said. “The problem isn’t just around your port; the chain link fence doesn’t stop it. What do you do?”

So the ACTDs not only deal with equipment and procedures for U.S. personnel, but also with the political realities that operations place DoD into.

Wilson said the best defense is to not get “slimed.” But assuming it happens, the answer is to be able to continue to operate. “These two ACTDs are among the first to seriously look at this problem,” she said.

Editor’s Note: This information is in the public domain at <http://www.defenselink.mil/news>.

Can't Get To Performing Without Storming

Working as a Team

NORMAN H. PATNODE

Why do some teams seem to speed shift straight to overdrive, produce amazing results, and have a blast doing it, while other teams just seem to stay permanently stuck in park, producing nothing and going nowhere?

As a professor teaching Program Management and Leadership in the Defense Acquisition University's former Level III Certification Course in Program Management—the 14-week Advanced Program Management Course—I've pondered this question often as I've watched over 50 teams go through the process of forming, storming, norming, and per-

You know, I always thought I knew something about leadership, but despite my best efforts, this pole is acting just like my program costs—no matter what I do, it keeps going up.

Patnode is a Professor of Program Management and Leadership at the Defense Acquisition University, Fort Belvoir, Va.



forming. Not all of them made it to performing. But many did.

So what separates the “overdrive” teams from those “stuck in park?” The ability to successfully storm. If you want to reach the pot of gold, you have to follow the rainbow. But the rainbow doesn't appear until *after* the storm.

Team Building

One of the most dramatic examples of this I've seen occurred one sunny morning out on a grassy parade field. I was facilitating a group of 12 students through some team building exercises. We had worked our way through awareness and trust, and were taking a short break after debriefing a challenging problem-solving exercise the group had just completed.

Toward the end of the break, as we sat in the grass sharing stories and waiting for the others to return, I asked the six students who were there if they'd like to try a little “extra” exercise. Having nothing better to do, they agreed.

Now this exercise, on the surface, appears quite simple. I asked the six of them to stand shoulder to shoulder in two lines of three, with the two lines facing each other. I then asked them to bend both their arms at the elbow, and with their forearms horizontal, to point at the line of folks opposite them with their index fingers. After repositioning a few folks slightly to put all their index fingers in a straight line, I placed a long, slender, lightweight rigid pole (a thin green tomato stake) so that it sat on top of their fingers. After explaining that they had to keep their index fingers in contact with the bottom of the pole at all times (“grabbing” the pole in anyway was against the rules—they had to simply let it rest on their fingers), I told them their task was to “simply” lower the pole to the ground.

I asked the group if they understood the task, and then released my hand

from the center of the pole. The pole immediately began to move—slowly and steadily *upward*. The group was not overly concerned by this, and indeed, judging from their giggling and laughter, appeared to find this unexpected turn of events amusing. Despite their numerous conversations and best efforts, the pole had soon moved from waist level to eye level. Since this is not a very comfortable position, I asked them if they'd like me to reset them so they could try again. They quickly agreed, and with a few quick words of encouragement from me they were off again. Their discussions remained quiet, calm, and extremely polite, and by now the other six students had returned and were watching with interest. As I explained that we had decided to do an “extra” exercise for fun, we all watched the pole slowly rise again to eyeball level. At this point the participants declared the task undoable, and asked if they could quit and do a “real” exercise. Noting to myself that this group got nowhere near the storming phase, I cheerfully agreed.

The full group of 12 then worked their way through three more problem-solving exercises, each significantly more challenging than the last. The group did well, and really began to pull together as a team. They had come to see each new exercise as a “challenge,” and they were now sharing their ideas and criticizing each other's ideas fast and furiously as they raced the clock to complete each new challenge.

I was delighted with their progress, and although we were nearly out of time, I decided to return to the “lower the pole” exercise. Since we hadn't debriefed the earlier “failure,” I wanted to try and squeeze some learning out of that experience.

I asked the group if they were ready for their final challenge of the morning. “Bring it on!!” they all chorused. They were a bit surprised, and a little concerned when I announced we'd be doing the “lower the pole” exercise again — after all, they'd all “seen” with their own eyes that it couldn't be done.

Recognizing the need for encouragement, I assured them that it could indeed be done, and asked the six students who had not previously done the exercise to please line up. I asked the others to step up close and watch. After placing the pole on their fingers and removing my hand, the pole began to, you guessed it, rise.

But it was different this time. Based on what was said, and how it was said, it was obvious this group was very concerned about the pole moving in the wrong direction. Without any real discussion, John and Tom both took over and began giving instructions. When they didn't get the results they wanted, they began shouting directions, louder and louder, but the pole continued to rise.

And then it happened—the accusations. Tom was yelling at Gary that it was all his fault, and that he was the one making the pole go up. Amazingly, save for a few murmurs of protest, Gary remained silent. But then John and Susan began to yell at Gary too. “Get your act together, or we're all going to fail because of YOU!” This was more than Gary could stand. He exploded! Yelling at no one in particular, but everyone at once, he pulled his fingers down a foot below the bar and exclaimed that it couldn't be his *%?!* fault because he wasn't even touching the !<?*# pole!

The best way I know to describe the intensity of this moment is to tell you that the six students who were observing each unconsciously took two or three steps backward. The looks on their faces said it all.

There was a moment of stunned silence among the participants. Trent was the first to speak, “I think I know why the pole's going up.”

“Let's hear it,” said Susan.

“Well, we've been told we have to keep our fingers in contact with the bottom of the pole, but the pole is so light that by the time we feel the pole on the top of our fingers, we've already moved it

PATH TO PERFORMANCE

Although each team is as unique as its members, teams develop and grow along a predictable path. The most commonly accepted model of team development was published in 1965 by Bruce Tuckman, and consists of four distinct phases—*Forming*, *Storming*, *Norming*, and *Performing*.

Forming

This stage begins with introductions and is typically characterized by questioning. Why are we here? What are we supposed to do? How are we going to get it done? It usually involves a fair amount of apprehension. The team members are cautiously exploring the boundaries of acceptable group behavior. Individual roles and responsibilities are unclear and processes have not yet been defined. During this stage, the team typically makes little, if any, progress toward achieving its goal.

Storming

Conflict emerges as team members struggle to enact their personal agendas and react against the efforts of others to control them. The authority and/or competence of individuals are often challenged. Discussions can become heated and quite emotional. Team members try to rely solely on their personal and professional experience and resist collaborating with most of the other members of the team. Impatient about the lack of progress, team members often argue about what actions should be taken next and opinions can become quite polarized. This is usually the most difficult phase

for a team, but it's a natural and necessary step.

Norming

The team begins to experience group cohesion for the first time. Norms emerge as the team works through the conflicts, and a sense of mutual respect and support develops between the team members. They begin to see themselves not as individuals, but as members of the team. They accept the ground rules and their roles in the team. The team discusses and develops its processes. Enthusiasm is high, and the team is tempted to go beyond the original scope of its tasking. The team may engage in fun and social activities.

Performing

Having gotten to know one another, the team members understand each other's strengths and weaknesses. They make full use of their strengths as they begin using their team processes to troubleshoot, solve problems, and make decisions. The team has a shared vision and begins to get a lot of work done. Disagreements still occur, but are now resolved positively, with team members readily making any necessary changes to team processes or organizational structure. In addition to processes and structure, the team also spends time attending to relationships, and team members look out for one another. Working together as a team is fun.

up—up off the fingers of the people next to us. And then they do the same thing, over and over. The pole keeps going up and up.”

“Man, is this a cruel party joke, or what?” interjected John, which brought a much needed laugh to the team. (The observers were beginning to feel comfortable enough to step back up to the group.) It was at this point that Tom said, “I guess we owe Gary an apology.” Susan and John were quick to apologize

for their earlier hasty judgments, and Gary was graciously accepting these apologies while confessing that only moments before he was SURE that the real problem had been Susan, so he was just as guilty as they were.

Then out of the blue, Cheryl made an insightful observation. “Our fingers are like the people on a team, only they're not working together . . . they all know the goal . . . but they're not working together.”

Trent piped in, “OK, so now we know the problem—it's not to lower the pole—it's to get our team member fingers to work together.”

“How do we do THAT?” asked Susan.

It was Gary, the previously declared “cause” of the problem, who offered the key—communication. “We have to get our fingers to talk to each other.”

Susan instantly shot back, “But we already tried that. We talked, and yelled, and even cursed at each other, but the pole still went up! I don't think talking will work, and I really don't want to go there again.”

“Think ‘communicate,’ not ‘talk,’” said Trent, and with that Gary slid his fingers together, capturing Susan's. Trent's eyes lit up and he did the same, capturing one of John's fingers. Gary instructed everyone to slide their fingers into groups. “Look, now we have three players on the team instead of 12—communication has to be easier.”

Tom suggested they shift to two groups of fingers, one at each end of the pole. Then, with quiet confidence, the group slowly and easily lowered the pole to the ground, their fingers “talking” through their shared sense of touch.

There was a long moment of quiet, hushed amazement as everyone realized what just happened—then the whole group erupted in loud, victorious cheers.

“Well, how many of you still think this exercise is unsolvable?” I asked as we stood in a circle preparing to debrief the experience we'd just shared.

"Ah-Ha!"

“What led to success? What prevented success in the earlier attempt? How are these two experiences different?” We discussed these questions at length, and squeezed a good deal of learning out of the experiences, but it was days later before I had the “ah-ha” that led to this article. I had witnessed the formation and growth, along a very compressed timeline, of two six-person teams. When I

fit this experience into the framework of the forming, storming, norming, and performing model of team development, it's clear that the first team never grew past the politeness of the forming stage, while the second team clearly charged into and through the storming phase.

Examining the Storm

The “storm” starts in different ways for different teams. Just as teams differ in many ways, “storming” can begin within a team in many different ways. It may be as subtle as someone sitting in a different chair, or as unmistakable as an explosive outburst of anger. Storming, like the meteorological phenomenon it's named after, comes in many forms. But in every case, storming doesn't end until the team addresses the needs and desires of each of the team members.

When people come together to form a team, they do so to accomplish some common goal they can't achieve by themselves. However, while the team members may agree in broad terms on the goal and what needs to be done to get there, they each bring their own individual needs and desires with them. At the outset the individual needs and desires of each member remain largely unknown to the other members of the team. It's not until these needs and desires are shared and addressed that a team begins to coalesce and “perform.”

So why is it so hard for people to share their needs and desires with the other members of their team? Well for starters, they're often strangers, so there's the real concern of embarrassment, ridicule, or even retribution, especially if the desires are self-centered or not politically correct. Thus, for most people there's a significant level of “discomfort” involved in sharing their needs and desires. In addition, because needs and desires, like assumptions, are often subconscious, team members sometimes aren't even aware of their needs and desires, so they don't get openly shared.

As long as the discomfort or fear remains, most people will avoid openly sharing their needs and desires. This leads to the polite, reserved behaviors

typically seen within teams in their early “forming” stage. But even at this stage, “norms” are inadvertently being set within the team. Team members begin to sit in the same chair—“their” chair. A few of the members begin to make decisions and to speak for the whole team, deciding what's to be done next and setting deadlines. Because these “norms” are not set explicitly—they usually happen without anyone talking about them—they often clash with the needs or desires of one of the team members. When this happens, it can open the door for the team to begin storming. But only if that team member feels safe enough to put his or her concerns on the table. If a team member believes that speaking up is more painful than living with the consequences of a proposed action or decision, and chooses to remain silent, then the team will miss the benefits of storming.

When something does get thrown on the table that is in direct conflict with someone else's need—something too painful to ignore—and the team member speaking up still feels a bit unsure of his or her safety, then the resulting challenge may be a bit clumsy and emotional. This can be painful (not meaning blood is spilled or punches are thrown), but until all team members have put all their needs on the table, and they've all been addressed by the

group, the team won't get to performing. It's necessary for a team to go through the awkward, uncomfortable discussions we've labeled as “storming.” So don't be afraid of it. Encourage it.

It's About Trust

Storming is saying what you honestly think, despite the risks involved. This takes a tremendous amount of trust, which highlights why it's so important to spend time up-front in team development addressing things such as ground rules, common values, and roles and responsibilities.

When the members of a team develop trust in each other, they're willing to present ideas and defend them because they know that everyone will listen to their ideas, think about them, and give them honest criticism. That's the benefit. The process of storming improves and polishes ideas by identifying and challenging assumptions, obstacles, and expected outcomes. Better ideas result in better solutions, and better solutions equate to higher team performance. By “storming” ideas before implementing them, teams can create their rainbow and follow it to the pot of gold.

Editor's Note: The author welcomes questions or comments on this article. Contact Patnode at Norman.patnode@dau.mil.

DFARS Transformation

The Department of Defense is kicking off a major transformation initiative to identify dramatic improvements and reductions to procurement policies, procedures, and processes in the Defense Federal Acquisition Regulation Supplement (DFARS).

A task force, under the direction of Deidre Lee, Director, Defense Procurement and Acquisition Policy, will consider bold changes and make proposal recommendations. The task force will also develop legislative proposals for consideration by the Congress for future changes to the DFARS.

The public is encouraged to participate in generating ideas for improvements. To submit your proposals, go to the following Web site:

<http://www.acq.osd.mil/dp/dars/transf.htm>

DPAP will consider and post all ideas, but its aggressive schedule precludes responding on an individual basis.

Power Electronics Building Blocks (PEBB) Program

PEBB Bringing a Whole New Perspective to Power Control and Distribution

JOSEPH C. PIFF

The Power Electronics Building Blocks (PEBB) program was a government-sponsored research and development program with the vision of changing the paradigm for designing and manufacturing electrical high-power conversion and control products. Since the U.S. Government does not manufacture products, success of this program would be measured by the acceptance of the new concept by the power electronics manufacturing industry and by the various commercial and military users of these products. A change in the design and manufacturing paradigm would effect a change of emphasis from pure operational efficiency to a combination of operational and design and manufacturing cost efficiency.

New Power Electronics Program Generated, Funded by ONR

The Office of Naval Research (ONR) exists to invest taxpayer dollars in programs that define basic knowledge and exploit that knowledge to develop technology options that provide affordable capabilities to the Navy and Marine Corps. ONR pursues an integrated Science and Technology (S&T) program from basic research through manufacturing technologies. All programs are to consider the affordability of the final product. Research areas include oceanography; advanced materials; sensors; electronics; surveillance; mine counter-



Piff is Manager, Technical Programs Department, Anteon Corp., in Arlington, Va. He holds an M.E. in Engineering Administration from The George Washington University and a B.S. in Engineering Physics from Cornell University. He has 30 years' experience as a defense contractor in planning, managing, coordinating, and executing R&D projects. Currently, he is working for ONR in several program offices. The author gratefully acknowledges the many Anteon staff members who furnished their expertise to the efforts described in this article, as well as Terry Ericson, ONR, who directed the program and developed the graphics.

measures; weapons; and surface ship, submarine, and aircraft technologies.

The Power Electronics Building Blocks (PEBB) program, conceived in the ONR Ship Hull, Mechanical and Electrical Systems Science and Technology Division, and initiated in late 1994, included Research and Development (R&D) of electronics, materials, and manufacturing techniques. ONR funded the program at Anteon Corp., where the company performed program management

assistance; PEBB design, fabrication, and testing; PEBB trade show; and PEBB communication system design and implementation work.

The primary responsibility of the ONR Program Management Officer, after conceiving the idea for the product and achieving an indication of interest from the user community, was to assemble a team of R&D organizations that could move from concept to reality in a relatively short period of time. At the same

time, he had to incorporate evolving DoD and ONR procedures into his program plan to ensure program acceptability by ONR senior management personnel, who ultimately have funding authorization authority over specific agency research programs.

The PEBB concept requires a whole new way of thinking about power control and distribution. Navy procurement personnel and ship design and procurement personnel at organizations that design and build our nation's ships (i.e., shipyards) must be prepared to consider these new ideas as they are readied for implementation. Major procurement and life cycle cost savings, and space and weight savings were predicted after the success of the PEBB program.

Assembling a Team

To most quickly achieve this new way of thinking, we began educating the appropriate personnel as soon as practical. We also began preparing the PEBB program products for Fleet implementation by developing prototype demonstrations of predicted shipboard equipment as quickly as possible.

A relatively large team was assembled that included academia, a Navy laboratory, Federal Government laboratories, industrial manufacturers, and system integrators for commercial and military customers (Figure 1). Together, they tackled the management challenges of implementing PEBB using several available techniques, including electronic communication and collaboration, definition of an open architecture, public demonstration of interim product, and technology review workshops.

Additionally, the policies and procedures of ONR dictated schedule challenges that had to be addressed. The PEBB program was the first Concurrent Engineering S&T program undertaken at ONR, as well as the first S&T program to initiate Integrated Product and Process Development (IPPD) procedures under the then new Department of Defense Directives issued by the Secretary of Defense in 1995.



The Power Electronics Building Blocks (PEBB) program fabricated a special, lower-power demonstration unit that could be demonstrated at trade shows. Employing the latest technology, the demonstration unit could operate on single-phase, 220V input power. At each show, we continued to demonstrate increasingly varied and sophisticated types of electrical loads powering practical operating systems.

Terry Ericson, ONR PEBB Program Management Officer, has stated that undertaking the management of a program implementing these new directives in a pervasive, highly aggressive technology program has been the greatest challenge of his career.

This article will address the management issues encountered during prosecution of the PEBB program.

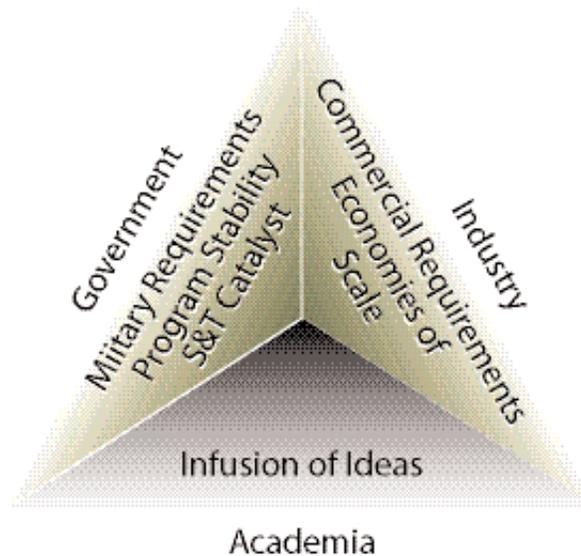
Market Information

Commercial and military organizations have been moving toward using electrical energy as the universal medium for transport of energy for several years. The concept of energy transport using electrical wires rather than by mass transport using steam, air, or other fluids in factories and in air, land, and sea vehicles offers many advantages, including reduced piece parts, ease of control, and minimized wear. The end result is the potential for a substantial increase in performance and a reduction in ownership cost of the end product.

The Navy has performed many studies of the benefits of employing more electric systems on ships, and concluded that both fabrication and operational benefits accrue. Additional cost benefits accrue if products have both a commercial and military application.

A primary enabling technology for the entire range of “more electric” applications is the rapid evolution in the field of power electronics (Figure 2, p. 49). A family of power electronics devices allows the production of power management modules that can handle all of the electric power control and conversion functions required to move power from the generating and storage sources to the ultimate loads. Consumers purchase the added value of electrification of our world in products such as automobiles that now, more often than not, incorporate electric windows and door locks. The PEBB program was initiated in recognition of the opportunities for cost reduction in power electronics by exploiting and improving emerging device technology (especially solid-state

FIGURE 1. Collaboration Triad



power devices), packaging concepts, and circuit topologies.

The mission of the PEBB program was to design, develop, and demonstrate Power Electronics Building Blocks for commercial and military applications. The PEBB concept was to convert from complete system designs for each application—the clean sheet of paper approach—to a system design achieved by selecting from a small set of standard modules, i.e., a modular design approach. A PEBB was defined as a universal power processor that changes any electrical power input into any desired form of voltage, current, and frequency output (Figure 3, p. 50). Considering the wide range of power handling requirements, a family of devices was expected.

ONR was the developer and primary sponsor of all PEBB and PEBB-related R&D. Commercial applications include electric automobiles, utility distribution systems, motor controllers, and alternative (e.g., solar, fuel cell) power systems. Military applications include high-power propulsion, auxiliary, and weapon systems for ships, submarines, aircraft, and land vehicles that use intelligent control to manage electric power systems efficiently and provide reliable, uninterrupted power. The Navy needs standardized, intelligent, solid-state power control devices, capable of managing a few Watts to mega-Watts to pre-

vent proliferation of high-cost, single application devices.

The Navy developed, fabricated, and demonstrated a family of universal, scaleable power control devices that deliver high-quality, digitally synthesized electric power for multiple applications. The PEBB, coupled with recently developed, power-dense MOS (Metal-Oxide Semiconductor)-Controlled Thyristor (MCT) switches, offers the opportunity to reduce size, weight, and cost of commercial and military power electronics systems by factors of 10 or more. A programmable multipurpose device, the PEBB is replacing many unique, high-cost power-conditioning elements used in previous system designs.

Engineering Approach

Product Description—Open Architecture. The PEBB is a complex device with electrical and mechanical boundaries that were purposefully set fuzzy at the beginning of the program to encourage broad, innovative, “out-of-the-box” thinking. A team of research and customer (or user) personnel was assembled to discuss the operational and physical requirements to be expected of the products and to place some structure and priority on the design concept. Team members were asked to develop a list of prioritized requirements for their application(s). Then, the team was assembled to discuss, weight, and score

the requirements to develop an indication of those features that were most important to the largest number of potential users.

In an effort to gain the greatest amount of customer satisfaction, the team used the “House of Quality” process to choose the best design characteristics for the Navy’s investment. We expected that some requirements would be contradictory, at least according to the laws of physics as we understood them, and would have to be negotiated to achieve something practical. To gain a consensus opinion of what a PEBB is or should be, a categorized and prioritized list of requirements was developed that was then used to set a relative level of need by each participant.

In late 1998, ONR came up with the descriptive nomenclature of “Plug and Play,” a concept very similar to that used in the personal computer industry. (Interestingly, the acronym for Plug and Play (P-n-P) plays off the solid-state device description of the interface: p-n or n-p.) Starting with a finite number of standard frames that are built to accommodate open, industry-standard electrical and mechanical interfaces, a manufacturer (or an individual) can purchase off-the-shelf components and assemble a functioning personal computer

A PEBB is defined as a universal power processor that changes any electrical power input into any desired form of voltage, current, and frequency output. Considering the wide range of power handling requirements, a family of devices was expected.

almost as easily as a child can assemble a structure from a set of blocks.

Because of the power levels involved, and to minimize the losses introduced by inefficient electrical design, the power electronics industry has been faced with the need to design specific solutions to each power conversion situation. The purpose of the PEBB program was to eliminate the need for most, if not all, of that unique design requirement in favor of a set of designated building blocks for assembly—much like a child’s set of blocks. However, for this concept to work, both the supplier and customer needed to benefit. Therefore, the program needed to develop boundaries.

On one side of the boundary, the “plug” side, the interface specifications needed to be well known so that every manufacturer could produce a product that would work with every other manufacturer’s product. On the other side of the boundary, the “play” side, there was room for unique engineering and, therefore, competition among suppliers, i.e., niche marketing. With this structure, PEBB manufacturers would have an incentive for entering the market with building blocks of their own.

Just as you can purchase a modem for your personal computer from any number of manufacturers, each with its own unique characteristics, the PEBB program developed an architecture that allows unique characteristic competition. For example, if a chip manufacturer wanted to sell complete inverters, that manufacturer would manufacture the chips, but would purchase all other components (e.g., filters, cabinets) from other manufacturers and assemble the complete system for sale. Likewise, that manufacturer may consistently buy components from the same set of suppliers or may have an in-house line of products, with a corresponding set of costs, which are assembled from components from multiple manufacturers. We wanted to encourage collaboration on the setting of standards for the interfaces between components. For plug and play to work, the system must be smart enough to recognize each com-

FIGURE 2. Trends in Power Semiconductor Devices

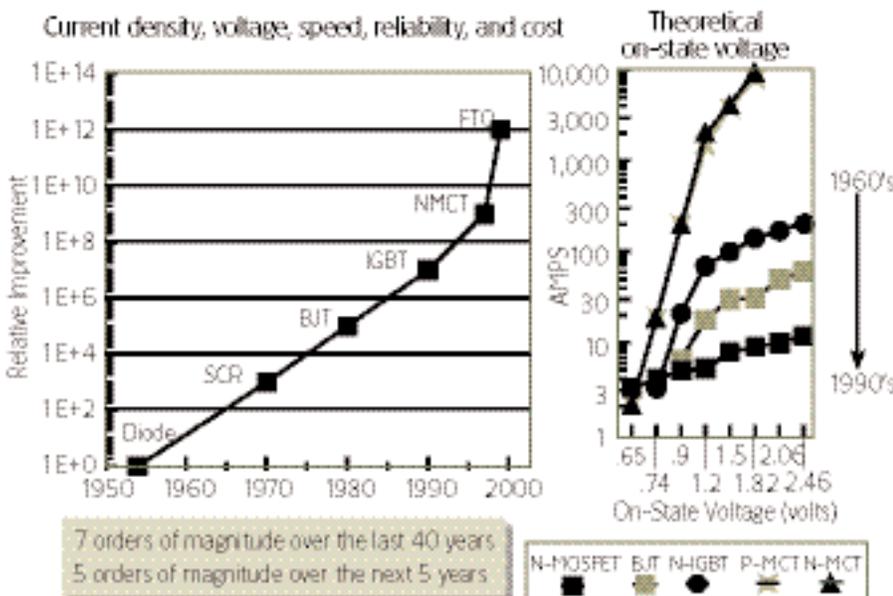
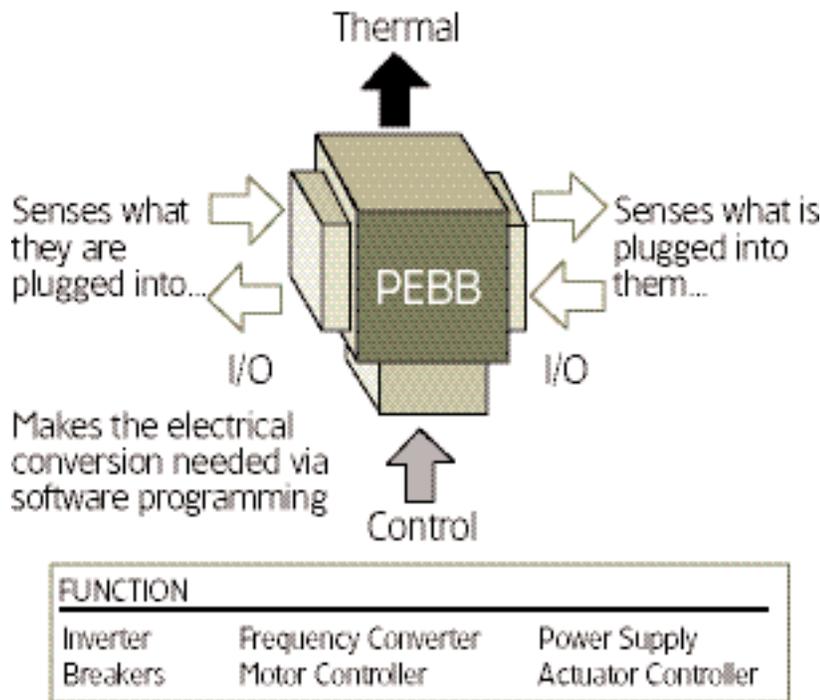


FIGURE 3. PEBB Systems—A Simple Set of Blocks for Power Electronics



ponent and adjust its operations to achieve the desired output with both the available input and grouping of components. However, the standards-setting process does not begin until a group of manufacturers in the hierarchical industry decide that standards are to their mutual financial advantage, so this part of the process is still ongoing.

Dual-Use Development. When commercial products are purchased and applied in military systems with little or no modification, the expectation is that, because of the competitiveness of the commercial market, the products are less expensive than products designed specifically for military application. The Navy desires: 1) to build systems based on pre-engineered, pre-tested, commercially applied building blocks instead of one-of-a-kind system developments; and 2) to buy hundreds of units from production lines that produce millions of units. Therefore, the PEBB concept was to initiate the development of a commercial product with pre-planned applicability to military systems. A market evaluation revealed that power electronics products were being engineered into commercial products and that this was a growing trend.

As conceived, the PEBB is software-reconfigurable; multi-purpose; smart; and is a universal device, replacing several specialized devices like circuit breakers, motor controllers, power conditioners, or inverters. The PEBB combines power-dense semiconductor developments with improved fabrication and packaging processes to reduce the size, weight, and cost of electric power conversion systems by a factor of 10 or more; and increases the efficiency in some areas by a factor of 100 (Figure 4 below).

Since it is a single, standardized unit of manufacture, production of this device

in large quantities reduces its cost. And since its controller incorporates a microprocessor, it provides an interface for device-level feedback and system-level control. A PEBB, jointly developed with industry, meets both commercial and Navy specifications. Thus, commercial use of PEBB technology contributes to even further cost reductions. Potential savings for the military are enormous if it draws upon the civilian sector to jointly develop a PEBB and its market.

The architectural similarity between Navy zonal electrical distribution and the proposed drive train for the Department of Energy (DOE) hybrid car is shown in Figure 5 (p. 52). The conceptual Naval zonal system shows zones for electrical propulsion equipment, power generation and conversion equipment, and “user” or “auxiliary” equipment. The conceptual electric/hybrid vehicle shows a power source (fuel cell, turbine, etc.), bi-directional inverters, an energy management and control system, energy storage, and an electric drive motor. In some applications, the power levels are similar, while the large loads onboard ships are significantly larger than those necessary in an automobile.

Concurrent Engineering. Concurrent Engineering was an early name for the currently implemented (and expanded) IPPD initiative within DoD. The DoD definition of IPPD is “a management technique that simultaneously integrates all essential acquisition activities through the use of multidisciplinary teams to optimize the design, manufacturing, and

FIGURE 4. PEBB Program Achievements vs. Goals

PERFORMANCE PARAMETER	UNITS	PRE-PEBB ACHIEVEMENT	PEBB GOAL	PEBB ACHIEVEMENT
Power Density	KW/ft ³	5	50	50-600
Turn-Off Current	A/cm ²	50	500	300
Turn-On di/dt	A/nsec	1	10	1500
Turn-Off Time	nsec	1200	120	400
Off State	Volts	1000	3500	6500
Switching Frequency	KHz	5	70	10-20

supportability processes. IPPD facilitates meeting cost and performance objectives from product concept through production, including field support.”

One of the key IPPD tenets is multidisciplinary teamwork through Integrated Product Teams (IPTs). These IPTs are staffed with experts in the various technical fields (e.g., design engineering, manufacturing, quality control, logistics, product support) required to bring the product to fruition. When studied, many of the tenets of IPPD can be related to the concepts implemented in the International Standards Organization (ISO) 9000 Quality Standards. IPPD was implemented in DoD by direction of the Secretary of Defense on May 10, 1995, several months after the PEBB program had begun operations.

Ericson, the ONR PEBB Program Management Officer, had already been working for several years prior to program initiation to establish realistic but aggressive goals for the program. He had been meeting with power electronics industry principals to determine the feasibility of the concept, to identify technical and manufacturing shortfalls, and to establish the alliances necessary for success. His IPT consisted of principals in the power electronics device design and manufacturing industry and those organizations that purchase those devices to assemble functioning power conversion units, along with Navy power electronics R&D personnel.

This team met frequently in the early years of the program and used the team communication system described on p. 52 to reduce the need for expensive face-to-face meetings. Its members possessed the correct mix of expertise to ensure that the design being developed could be produced using standard manufacturing equipment, would satisfy commercial/industrial and military requirements, and would have reasonable reliability and life cycle expectancy when deployed in practical applications.

The PEBB IPT, working with the PEBB Program Management Officer, established a series of intermediate milestones

The PEBB program was initiated in recognition of the opportunities for cost reduction in power electronics by exploiting and improving emerging device technology (especially solid-state power devices), packaging concepts, and circuit topologies.

for operating hardware. This new technology was a radical departure from current practice in the industry. As such, incremental demonstration of the developing capability was expected to be necessary for continuing acceptance of the feasibility of the concept. Therefore, ONR established three incremental demonstration milestones using standard Navy terminology for replacement equipment: function; form and function; and form, fit and function (Figure 6, p. 53).

- The first generation of PEBB devices used first-generation advanced power electronics solid-state technology to demonstrate in working models the functionality of the concept.
- The second generation of devices demonstrated multi-functionality by integrating the controlling microprocessor with the high-density power semiconductors to eliminate separate,

unique devices for each required power electronics function.

- Finally, the third generation of devices demonstrated all of the foregoing in a compact, power-dense package suitable for both commercial and military applications.

Each step along this path to ultimate success was defined in a manner that would yield solid information for the next design step. If any technological difficulties were encountered, they would be addressed long before the point of no return. Additionally, ONR encouraged the Naval Sea Systems Command to become familiar with the technology by participating on the IPT and by developing and testing units manufactured by their traditional commercial/industrial suppliers.

Communication Management

Program Reviews. Early in the PEBB program, the primary method of communication among program participants was the quarterly Program Review. The largest contractor in the program was the silicon chip designer/manufacturer, and that contractor usually organized and conducted the reviews at its site.

The first day was usually set aside for proprietary information exchange between this contractor and the government concerning new chip design progress. Then, one or two days of open presentations from various program participants allowed for discussion of the meaning of the PEBB concept and further refinement of the architecture of the device. These reviews included “breakout” sessions wherein the audience was broken into smaller parts by choosing specific topic areas for detailed discussion.

As the program progressed and the team communication system described on p. 52 was implemented and improved, these program reviews were scheduled less often and were held at the locations of other program participants, including universities, Navy laboratories, and other government agency sites. These

face-to-face meetings were highly successful at getting program participants into one-on-one discussions (especially during breaks in the presentations). These discussions were often the catalysts to major agreements for partnerships or for technological progress.

Team Communication. From the beginning of the PEBB program, it was obvious that an advanced communication system was going to be necessary to coordinate the operation of the program and to encourage program participants to collaborate during device development. The PEBB team of government laboratories, public and private universities, and commercial/industrial organizations was described as a “virtual company.” The virtual company was defined to mean that all participating organizations would be considered to be “units” of a company structure and, therefore, communication among these

units should be as seamless as it would be within a well-functioning single organization.

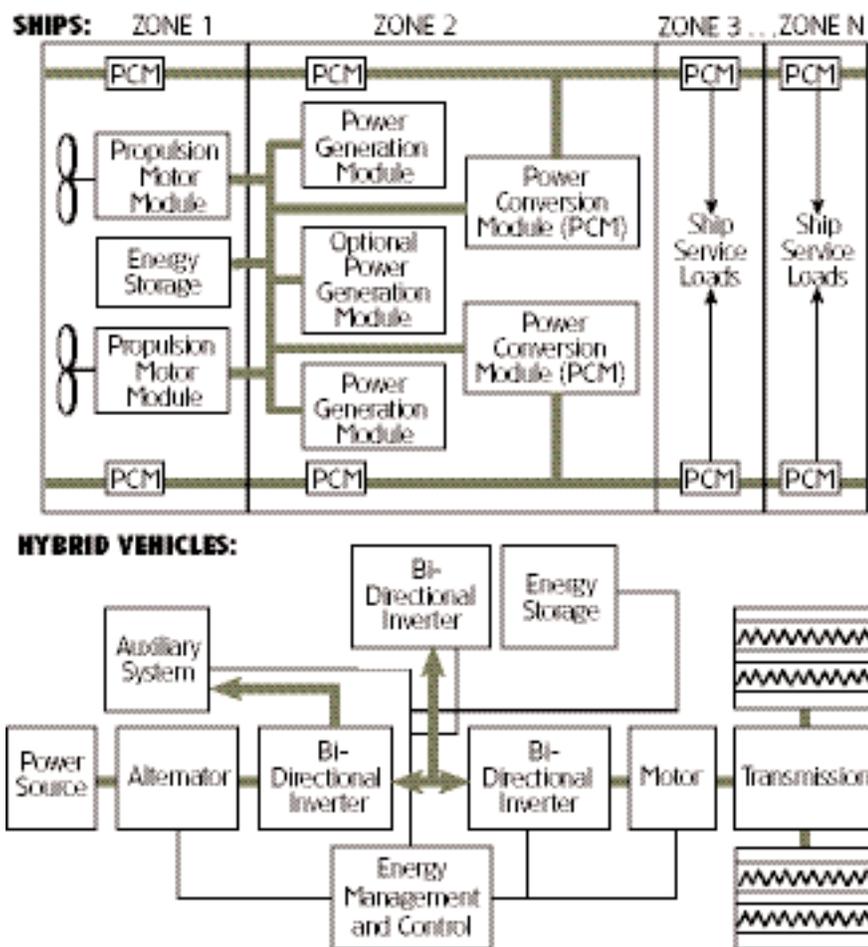
The team was formed, but the method of communication needed to be developed. Lotus Notes™, a commercially available product, was chosen because it provides e-mail, Internet browsing, Internet or Intranet site development and display, and database development and implementation for almost any conceivable purpose: project scheduling and tracking, collaborative document development, document routing, document and information sharing, and more.

Further, Lotus Notes includes a collaboration environment allowing for multiple program participants to comment on or edit a document. This allowed PEBB program participants to state their opinion about a topic, add more infor-

mation about the topic, or ask questions about what someone else said. This capability is especially useful, for example, for the process of developing product interface specifications. One of the purposes of the ONR-sponsored program reviews was to allow interested participants to get to know each other and open a dialogue that would continue between reviews.

To encourage this interaction, we established “forums” within Lotus Notes that included databases containing the design thinking to date, and areas where individuals could share and “discuss” ideas. The forums established included Modeling and Simulation; Applications/Systems; Commercialization; Processing; Passive Components and Materials; Packaging; PEBB Demonstration; Electromagnetic Compatibility/Electromagnetic Interference (EMC/EMI); and Form, Fit, and Function (3F), also known as Plug and Play.

FIGURE 5. Architectural Similarity of Ships and Hybrid Vehicles

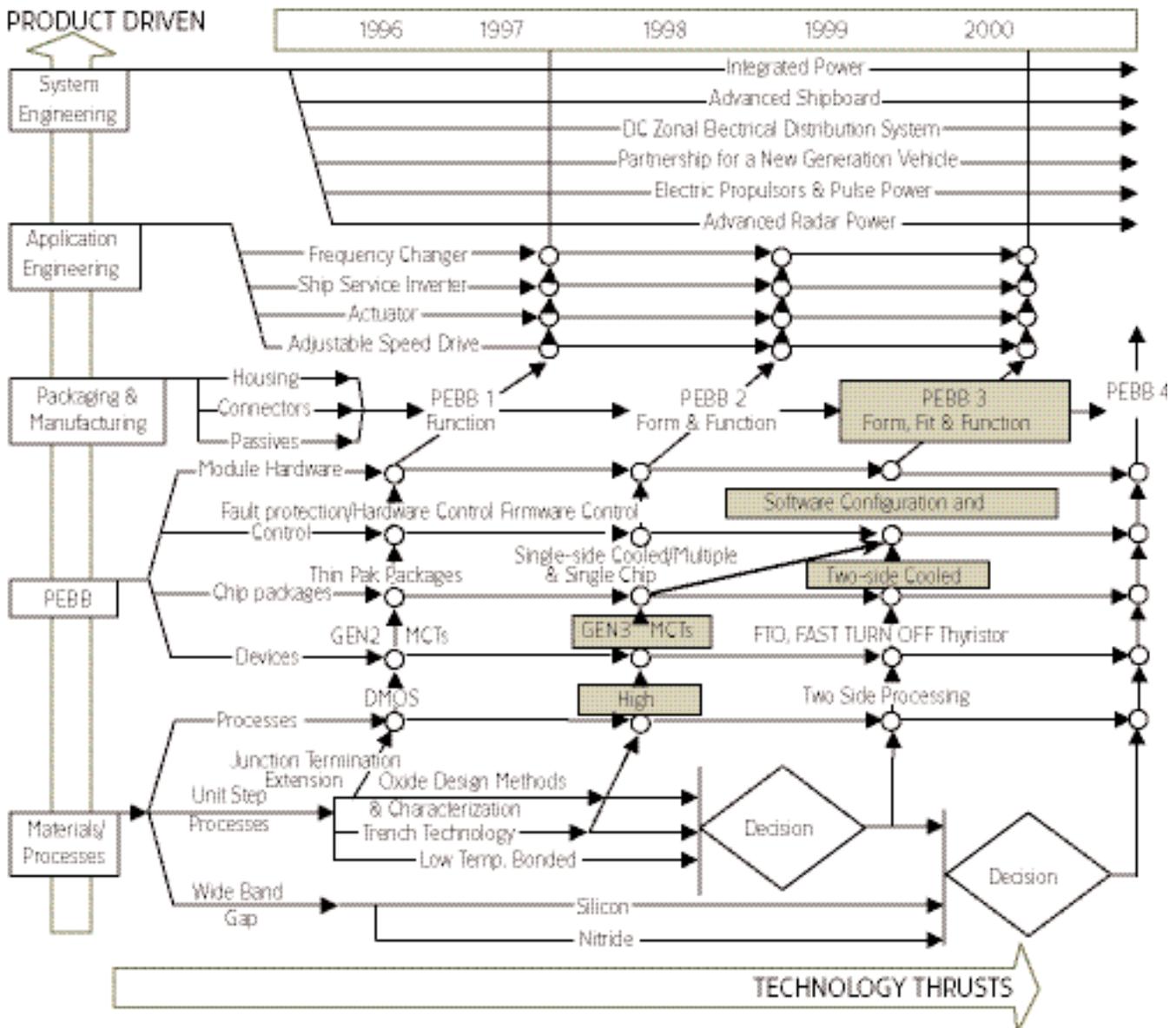


Public Demonstrations. For a large commercial market to develop, the PEBB vision needed to be shared with organizations that were not participating in the PEBB design and development program. As R&D projects yielded operating products, those devices were incorporated into practical operating systems that could be demonstrated at trade shows. For this purpose the PEBB program fabricated a special, lower-power demonstration unit that employed the latest technology, but that would operate on single-phase, 220V input power.

At each show, we demonstrated increasingly varied and sophisticated types of electrical loads. For example, we demonstrated an electrical motor operating a pump with a manual control valve to achieve a “needed” flow rate and compared that with operating the motor with PEBB control to achieve the same flow rate without the control valve and using less power, i.e., we could throttle the power rather than the flow.

The design of the PEBB supports control of electro-mechanical devices from a common base, thereby easing the

FIGURE 6. **PEBB Development Schedule**



manufacturer's requirements for developing specific control hardware and reducing the cost of delivery of final, operational product. For example, a linear motor manufacturer loaned a motor to be displayed as a load on the PEBB demonstrator. We eliminated the manufacturer's controller card and operated the motor with the latest version of the PEBB to demonstrate the ability to precisely control the acceleration rate of a projectile.

Workshops. In addition to the Forums implemented in Lotus Notes, specific topic-area workshops involving technology-specific experts were organized and conducted. We held an Applica-

tions Workshop and a Soft Switching and Resonant Converters Workshop.

Elements Contributing to Success of Program

The five-year, ONR-sponsored PEBB program was a highly aggressive technical program that developed new technology for application by commercial and military organizations. Commercial and military supply organizations have taken the concept and are proceeding with final engineering development. So, what were the elements that contributed to the success of this program?

First, a highly competent, highly dedicated program champion, Terry Ericson

of ONR, was consistently involved in all aspects of the program, from the intricate technical details to dealing with Congressional and Secretarial review and funding issues. His exceptional efforts to develop and hold together a large team of highly diverse personnel were perhaps the greatest contributor to the success of the PEBB Program.

Secondly, the communication system, both face-to-face and electronic, worked effectively to keep everyone informed as to the current state of development of the product and the plans for the future. However, the portion of this system designed to encourage the sharing of development ideas did not work as

well as desired. We believe that lack of training and, possibly, the competitive nature of the government contracting business was the greatest impediment to this effort. People were either unwilling or unable to find the time to learn the collaborative software functions. Moreover, the possibility of a lack of trust among participants negated the positive factors evident in the software implementation. For this type of effort to succeed in a "virtual company," a lot of effort to establish mutual trust will need to be expended.

Finally, the timing was just right. Our experiences in talking to people in attendance at trade shows was that both the commercial and military markets were ready for less costly, more compact design of power electronics systems. The technology, especially in silicon-based chips, was at the point where practical devices could be designed to achieve new levels of performance. Another measure of success of a technology development program is the number of new patents issued—over 70 patents were issued to PEBB program participants.

This development approach demonstrated the limitless possibilities for product development from concept to real-

ity when government, academia, and industry cooperate in the drive toward the major new technologies that will affect our lives in the 21st century.

A New Paradigm

ONR succeeded at instituting a new paradigm into the thinking of the designers of power electronics equipment. How does the Navy benefit? What are the next steps?

Several developments need to be continued in parallel. First, the heart of the PEBB is the switch as implemented in silicon. Further development of this technology to get the switching speed up from the current level of between 10 and 20 KHz to 70 KHz needs to be pursued. Several concepts are in process. At the same time, researchers in this technology area are considering material changes that could increase the high end of the temperature envelope, allowing a greater number of applications in harsh environments.

Secondly, continuing efforts to get industry to work together to establish interfaces between components and then effective minimum interface specifications are being pursued by ONR. Real plug and play cannot be achieved until this step is completed.

Finally, systems engineering needs to be pursued. The ONR PEBB Program Management Officer's next program responsibility is called the Advanced Electrical Power System (AEPS). The AEPS program will take Ericson's success one step further and begin speculating about the many alternative system designs for future systems using low-cost, flexible, modular, smart electrical high-power control and conversion devices. One of the many applications of this technology in the Navy is to use linear motors to launch and retrieve aircraft from the decks of aircraft carriers.

The ingenuity of our ship system design engineers will be tasked to employ this new technology in a manner that improves the operability, maintainability, and survivability of our Fleet assets and reduces the overall cost of these systems.

Editor's Note: The author welcomes questions or comments on this article. Contact him at JPiff@Anteon.com. For more information on topics discussed in, or related to this article, visit the AEPS/PEBB and ONR Web sites at <http://aeps.onr.navy.mil> and <http://www.onr.navy.mil>.

DAU AWARD PRESENTED TO OUTSTANDING STUDENT

The Defense Acquisition University (DAU), in partnership with the Bryant Adult Alternative High School, presented Bryant student Marlene Luchi with DAU's Outstanding Student of the Year Award. The presentation took place during a Bryant Honors ceremony at the school in Alexandria, Va., on Feb. 7.

Selected by the counseling staff at Bryant, Luchi has attended the school since 2000 and participates in many activities. She is currently President of the Bryant National Honor Society and also serves on the Leadership Committee. Luchi holds two jobs, one of which is at DAU as an assistant in the Office of the President. As a Partner in Education with Bryant School, DAU presents this award twice a year to recognize students who exemplify leadership, learning, and service. This is the first time the awardee has also been an employee at DAU.



From left: Air Force Col. William McNally, Air Force Chair, DAU Executive Institute; Marlene Luchi, recipient of the Outstanding Student of the Year Award; Army Staff Sgt. Duane Adens, DAU; and Navy Senior Chief, James Pratt, DAU Enlisted Advisor.

Photo by Barbara Zenker.

DAU SOUTH REGION HOSTS FIRST ANNUAL ACQUISITION, TECHNOLOGY, AND EDUCATION EXPO

Over 200 participants took part in the First Annual Acquisition, Technology, and Education Exposition, hosted by the DAU South Region, on Jan. 28, in Huntsville, Ala. Forty-five individual exhibitors from military, government, industry, and academia staffed over 30 exhibits. The day's events also included seminar sessions on the following topics:

- Overview of Defense Acquisition University
- DoD 5000 Series Changes
- Sustainment Systems Technical Support
- Cost Risk Analysis Tool

- Aviation Technology Assessment and Transition Process.

Due to its success, the Expo event is planned to be an even larger event next year.

For more information on the Annual Acquisition, Technology, and Education Exposition, contact Dr. Jerry Davis, Associate Dean, Outreach and Performance Support, DAU South Region, at jerry.davis@dau.mil. For more information on the DAU South Region, visit the DAU Web site at <http://www.dau.mil>.



Bruno Wengrowski, Professor of Contracting, DAU, delivers a presentation on "Sustainment Systems Technical Support."



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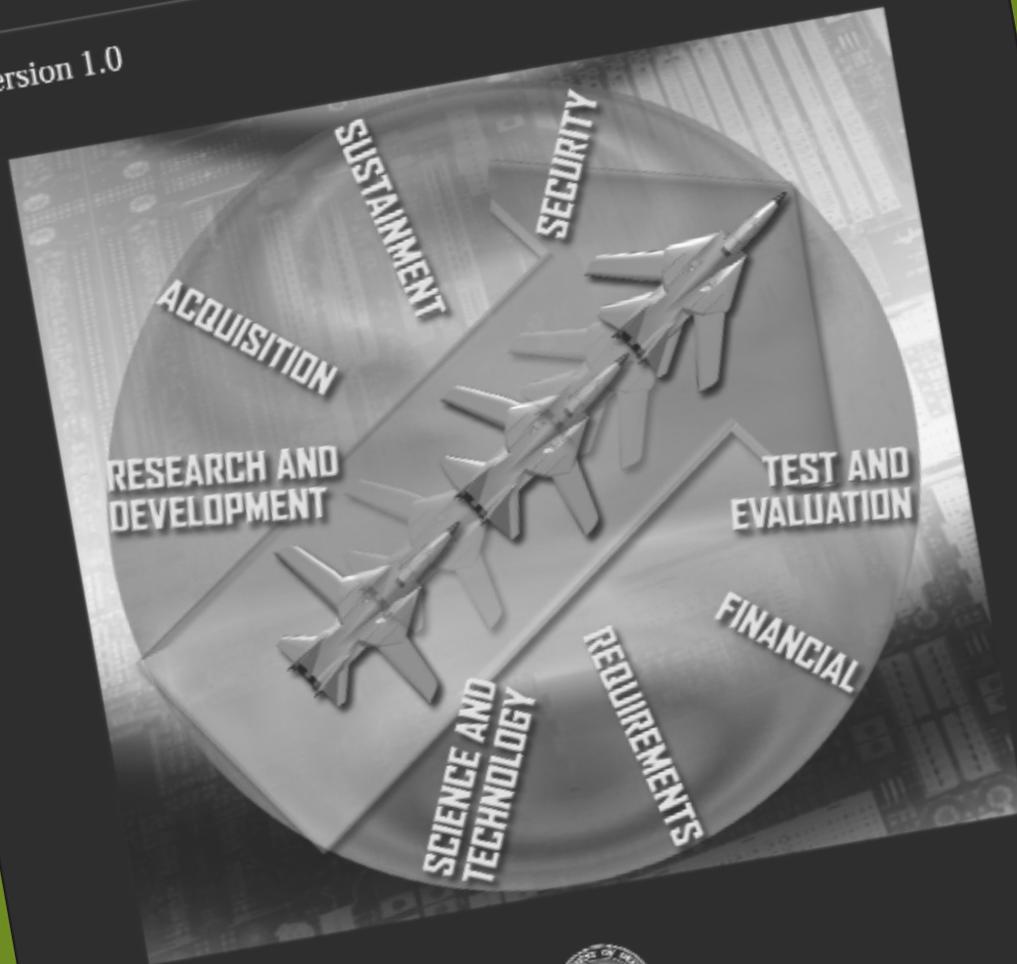
Director, Defense Procurement & Acquisition Policy Publishes New Manager's Guide



*Manager's Guide to Technology Transition
in an Evolutionary Acquisition Environment*

January 31, 2003

Version 1.0



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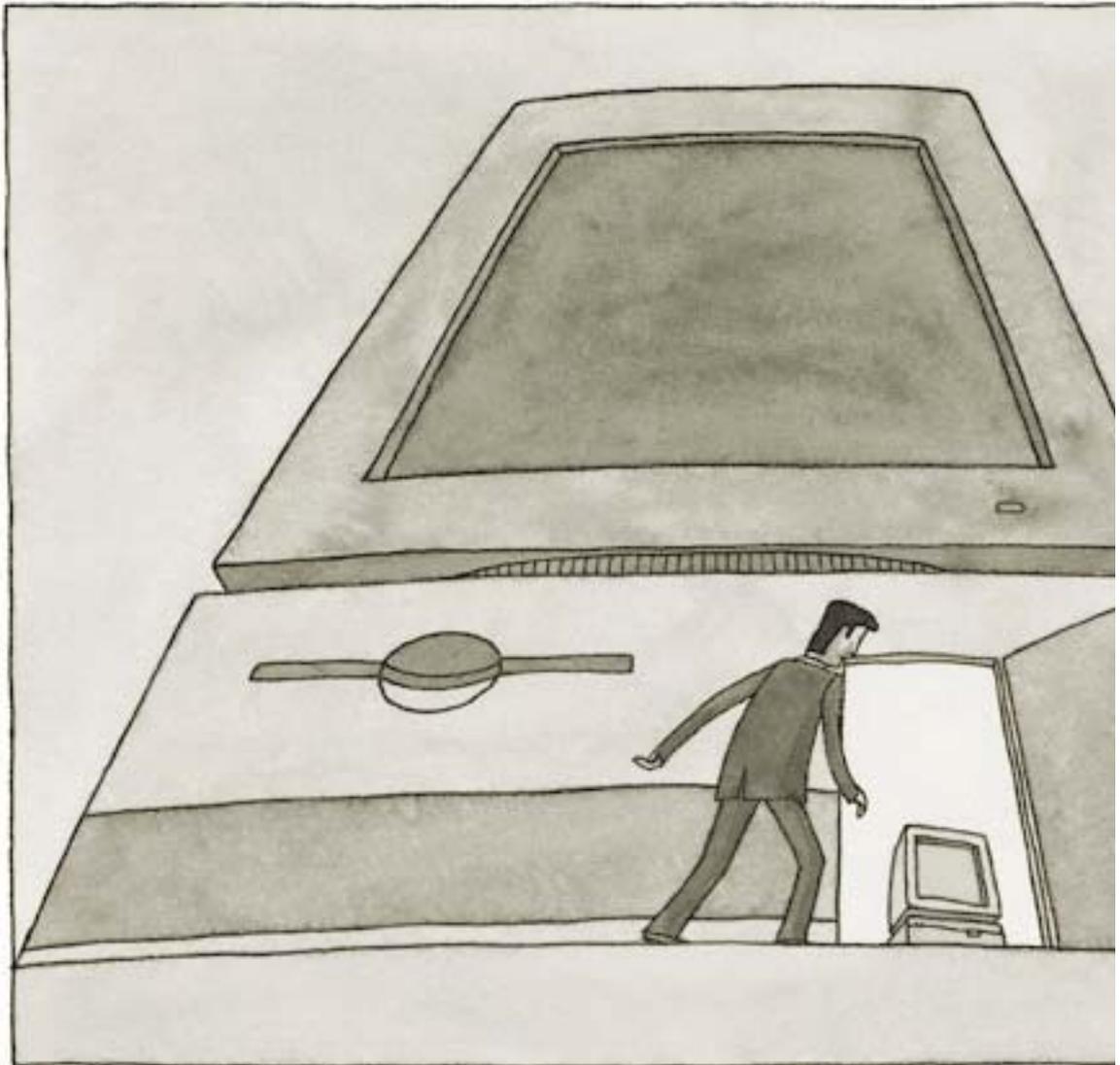
Security Support to Acquisition of Weapons Systems

Vital to Success on the Battlefield

ARION N. "PAT" PATTAKOS

The word *security* is not synonymous to a bad four-letter word. For some it may seem so if it adds further requirements, or seems to impede progress during research and development activities or the formal weapons systems acquisition process. The fact is that security, intelligence, and counterintelligence support to the acquisition of weapons systems is necessary for achieving success on the battlefield.

People in the protection business are not there to impede progress and yes, they are sensitive to the imperatives placed on program personnel dictated by cost, schedule, and performance. They are driven by the mandate to help field systems that have not been compromised, but nevertheless are open to exploitation by those not so friendly to our nation's interests. If you tend to equate security with a bad four-letter word, make it a good one such as *help*—a way to help field successful systems.



Program Protection Plan

DoD has now rescinded the outdated DoD 5000-series documents, and issued interim guidance pending the development and coordination of policies that are flexible and designed to more rapidly respond to warfighter needs.

Such concepts as evolutionary acquisition and spiral development are now important acquisition strategies, but the essentials of the various phases associated with the Milestone (MS) A through C decision points are the same in the interim guidance.

Concept and Technology Development are based on user needs and technology opportunities. When an affordable, militarily useful capability has been identified and demonstrated in a relevant environment (and can be developed for production in normally less than five

Pattakos is the Senior Advisor to the President/CEO of Beta Analytics International, Inc. He is a Certified Protection Professional (CPP) and an Operations Security Professional (OCP).

years), the System Development and Demonstration Phase is entered with a Milestone B decision. Milestone B is the point at which an acquisition program is initiated. Prior to this decision, the guidance states, is when the identification and protection of Critical Program Information (CPI) must be ensured. It is at Milestone B that a Program Protection Plan (PPP) is required once the CPI is identified (Figure 1).

ity to kill it, to counter it, to copy it, to shorten its expected combat life, or to cause a significant redesign of the system and hence expenditure of more research and development dollars.

If adversaries can do one or more of these damaging actions, an acquisition program must take steps to protect the identified CPI. In the case where programs do not have CPI, program managers must so certify in writing to the Milestone Decision Authority (MDA). If CPI does not exist, a PPP is not required.

Scientists, engineers, and other program personnel are schooled in applying various analytical processes to determine and achieve goals. Increasingly, so are Security and Counterintelligence (S/CI) personnel. This community of professionals recognizes that no longer is it acceptable to impose security requirements based strictly on book specifications or regulations. Rather, it is more effective to examine security needs in their specific environments. Just as program personnel are familiar with Risk Management techniques, so too are S/CI professionals.

The analytical process for protecting CPI is embodied in the requirement that program managers or their representatives prepare a PPP (as stated in Attachment 2 to DoD's 5000-series interim guidance). The PPP is required by MS B (if CPI exists) and thus logically must be prepared during the phases associated with pre-systems acquisition following the Milestone A decision. S/CI personnel counsel that developing the PPP as early as possible during MS A phases will avoid future security prob-

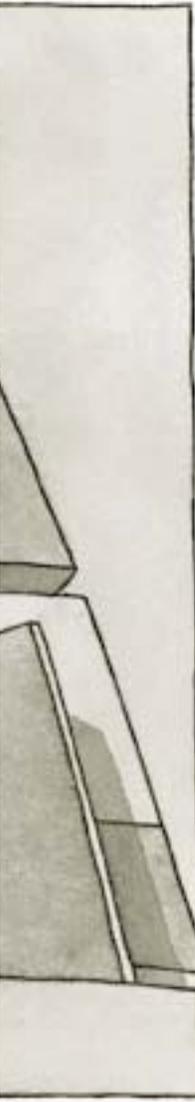
lems that might impact those project-sensitive areas of cost, schedule, and performance. The goal: our fielding of an effective system that is protected and secure from exploitation by the bad guys during combat.

PPP uses a Risk Management approach to identify, recommend, and implement security countermeasures designed to reduce risk to an acceptable level at an acceptable cost. When we use the term acceptable, we mean the person responsible for the system—the one who makes the resource decisions—usually the project manager or, in some cases, the MDA. A PPP describes what must be protected and why, against whom, what vulnerabilities might be exploited, and the necessary countermeasures for protecting the identified CPI.

A key step of the PPP process is the identification of what needs protection—the CPI—and why it needs protection. The “why” question is answered by establishing the adverse impact if an individual CPI is exploited based on the criteria cited (kill, counter, clone, etc). If more than one CPI is identified, metrics can be developed that establish the relative order of CPI importance. Such metrics give a clearer picture of the security risk when viewed in relationship to threat and vulnerability.

You Get What You Ask For

With CPI identification, it logically follows that we then must answer the question: “From whom do we need to protect CPI?” The counterintelligence community is charged with identifying the adversary collection threat to a system. Based on an Intelligence Production Request (IPR), written by the program managers or their representatives, a *Multi-Disciplined Counterintelligence Threat Assessment (MDCITA)* is prepared by Service counterintelligence analysts in coordination with members of the intelligence community. The notion “you get what you ask for” comes to mind here. Specifically, the preparation of the IPR is not a trivial exercise if you want an MDCITA that is a significant input to a well-prepared PPP. A program manager cannot just say, “gimmie threat” and



People in the protection business are driven by the mandate to help field weapons systems that have not been compromised, but nevertheless are open to exploitation by those who would kill the system, counter it, copy it, shorten its expected combat life, or cause a significant redesign of the system and hence expenditure of more research and development dollars.

Protecting CPI

When determining CPI, the term “crown jewels” should come to mind. CPI literally means that information, technology, or systems would cause significant harm if exploited by an entity inimical to our nation's interests. Among the criteria for determining such harm to a weapons system are our adversaries' abil-

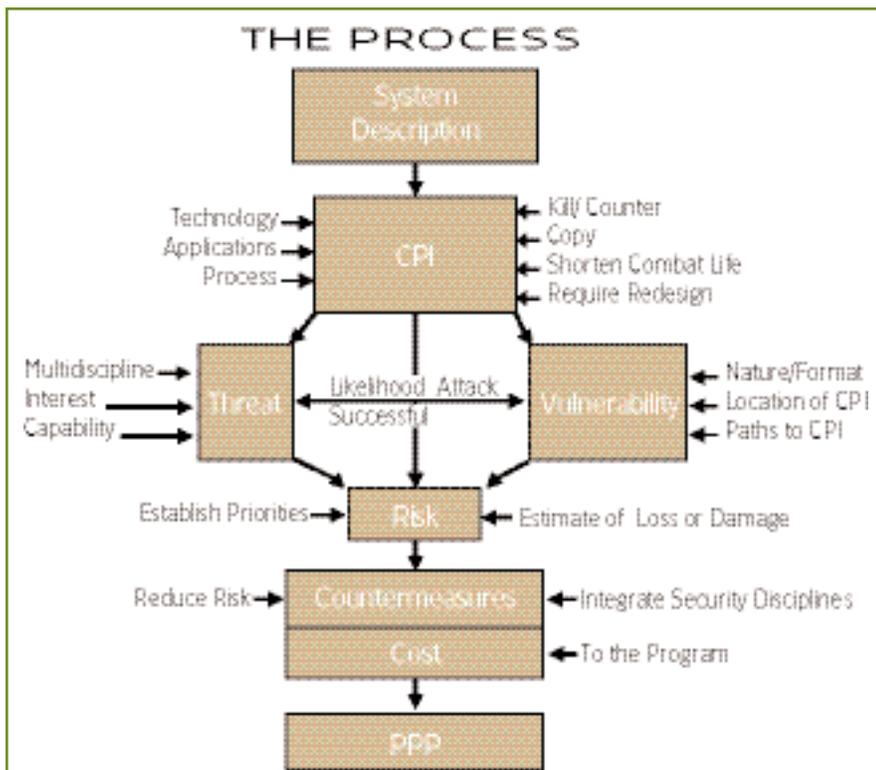


FIGURE 1. Program Protection Planning

expect a helpful response. Supporting SCI personnel can be of significant help in preparing an effective IPR.

Among other things, a successful IPR requires:

- A clear description of the system and its operational role.
- Details of the CPI and the rationale for its importance.
- The physical location of the CPI and how it exists (its form or format).
- CPI distinguishing traits/emissions and any sight or sensor sensitivities.
- System testing information.
- CPI relationship to key technologies such as those listed in the *Militarily Critical Technologies List*.
- Any anticipated foreign involvement.

A useful MDCITA provides details of adversaries' intent and capability to collect CPI using their human, signals, imagery, and their measurement and signature intelligence capabilities. Essentially, what is sought during this step is an estimate of the likelihood adversaries will target our system and how they might do it. Again, metrics can be developed to describe that likelihood.

An understanding of the threat supports an analysis of how our CPI might be collected by adversaries. This step provides characteristics of weaknesses or potential weaknesses that might be exploited by adversaries. What we seek to understand are those poorly protected pathways that adversaries might use to gain knowledge of our CPI. An exploitable weakness in the protection of CPI is the vulnerability. Some examples of typical vulnerabilities are:

- Lack of need-to-know enforcement
- Failing to use secure communications
- Poor classification management
- Poor computer security/information assurance
- Inadequate visitor controls
- Poor trash management
- Web sites that disclose too much
- Weak security training and awareness.

Metrics can be used to describe the degree of vulnerability.

Risk Reduction

The threat-vulnerability relationship provides an estimate of the likelihood of adversaries' success in accomplishing their target objectives (i.e., collecting

our CPI). The product of the adverse impact to our system (exploitation of CPI), and the threat-vulnerability relationship provides us with an estimate of the potential for loss (the risk) and provides the basis for a risk assessment. A risk assessment is not a mandated element for inclusion as part of a PPP, but is recommended to rank risks in relative order of severity. A risk assessment is the basis for establishing priorities for the effective application of security resources. It also provides a benchmark for determining the benefits of security countermeasures—the reduction of risk (Figure 2).

Security countermeasures are selected to reduce the risk of adversaries collecting and thus potentially exploiting CPI. One definition of the word countermeasure simply is anything that negates adversaries' ability to collect. Countermeasures may include personnel security measures, physical security, procedural measures, and technical security measures. Typical countermeasures include: implementing need-to-know policies; security clearances; implementing security classification guidance; encryption of communications; sound operations security practices; and many, many others.

The principal sections of a PPP include the elements previously described. However, more elements must be considered. These include attaching a time/event-phased security classification guide; a system security engineering management plan; an anti-tamper plan; and if foreign involvement or sales are contemplated, then a technology assessment and control plan is necessary.

While not mandated, developing an Operations Security (OPSEC) Plan is recommended. OPSEC deals with the generally unclassified evidence of sensitive activities or operations. In a message dated Jan. 14, 2003, the Secretary of Defense reminded all that the DoD has more than 700 gigabytes of Web-based data subject to adversary exploitation, and that by using the OPSEC process we could eliminate potential vulnerabilities from that source. Given the

amount of easily available information, determining the information (indicators) that may reveal CPI is critical.

The Counterintelligence community is dedicated to providing the support needed by the research, technology, and acquisition communities. To that end, DoD has designated 450 CI positions (150 per Service) specifically for such support. A Department of Defense Counterintelligence Field Activity (CIFA) has been established that has elements and organizations that support research, technology, and weapons system development. The Joint Counterintelligence Training Academy (part of CIFA) provides a two-week research and technology protection course with such related subjects as Risk Management and PPP.

Policy requires that a Counterintelligence Support Plan (CISP) should be prepared for each Research, Development, Test and Evaluation facility, for those acquisition programs with CPI, and may be extended to those contractor or academic institutions with CPI. The CISP is viewed as a contract between a CI supporting element and the organization supported. The CI representative, the supported element security manager, and the commander/program manager signs the CISP at the local level. Headquarters-level approvals are also necessary. The CISP outlines how 36 support activities, from threat briefings and debriefings to CI support to defensive information operations, will be conducted. The CI commitment to support program managers, commanders, and the entire research and technology community clearly is there.

Tug of War

A subject that has received much attention is when to classify and hence protect technology. S/CI professionals would like to see critical technologies (potential CPI) identified as early as possible during the MS A to MS B phases. Pre-milestone A would be great, some opine. However, the tug of war between enabling basic research and protecting the technologies that will be (or are) key to our systems is understood.

The Security and Counterintelligence (S/CI) community of professionals recognizes that no longer is it acceptable to impose security requirements based strictly on book specifications or regulations. Rather, it is more effective to examine security needs in their specific environments.

National Security Decision Directive 189 and Executive Order 12958 mandate that basic scientific research not clearly related to the national security may not be classified. Our technical know-how

is advanced with the open development and acquisition of knowledge inherent in basic research. But, it appears reasonable to accept the notion that protection is required when the “how” of applying that knowledge to a weapons system is determined. In DoD funding terms, this point lies somewhere between 6.1 (Basic Research) and 6.3 (Applied Research).

Security—A Profit Center

Security should be viewed as a profit center or at least as value added. We profit by fielding systems that support the warfighter if the systems are available when and where needed. Our adversaries' ability to kill, to counter, to clone a system, or to shorten its useful effective combat life does decrease a system's value and the way we profit. Such adverse impacts, in fact, expend resources in terms of lives and money. S/CI personnel, in coordination and cooperation with program personnel, are dedicated to making security work by taking appropriate security and counterintelligence actions at the right time.

The crest of the 902d Military Intelligence Group states: *Strength Through Vigilance*. It does indeed make good common sense.

Editor's Note: The author welcomes questions or comments on this article. Contact Pattakos at Pattakos@betaanalytics.com.

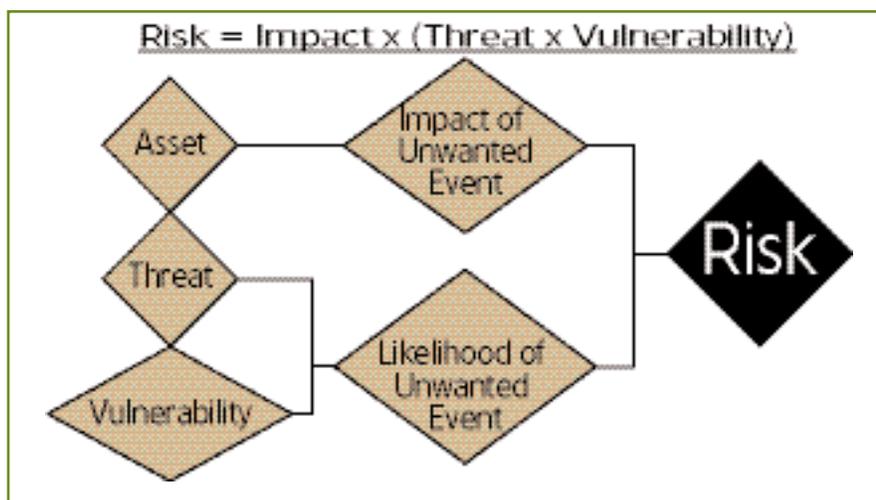


FIGURE 2. Risk Formula

Edward C. "Pete" Aldridge to Retire

The Department of Defense announced today [March 31, 2003] that Under Secretary of Defense for Acquisition, Technology and Logistics (AT&L) Edward C. "Pete" Aldridge, Jr., will retire from government effective May 23, 2003. Principal Deputy Under Secretary (AT&L) Michael W. Wynne will serve as Acting Under Secretary of Defense (AT&L) effective that date.



The Secretary of Defense remarked: "Pete Aldridge is a leader who has brought vision and results to a critically important position. His record of accomplishment in nearly two decades of service in the Department of Defense will be felt for many years to come. I am grateful for his willingness to serve and help us [in] defining priorities that are transforming this Department. He will be missed and he will leave with our best wishes and full intention to turn to him frequently for counsel and advice."

Reflecting on his career, Aldridge said, "Every job I have had has been exciting, demanding, satisfying, and worthwhile and has contributed in a variety of ways to our national security." He continued, "Now it is time, for personal reasons, to move on to a more relaxed period of my career. I will continue to support the national security interests of this country, albeit in a less direct way."

Aldridge was sworn in to his current position on May 11, 2001. His 42-year career includes 18 years of service in the Pentagon—first as an operations research analyst, as the Director of Planning and Evaluation under Rumsfeld during his first tour as Secretary of Defense, as Under Secretary and then Secretary of the Air Force under President Reagan, and currently as the Under Secretary of Defense (AT&L).

The other non-government periods of Aldridge's career have been spent in the defense industry, working on weapons and space systems vital to our warfighters. Immediately prior to his current position, he served as the President of The Aerospace Corp., a non-profit organization dedicated to solving critical national problems through science and technology. Prior to that, he served as the President of McDonnell Douglas Electronic Systems.

Aldridge has received awards from numerous societies, including Rotary National Award for Space Achievement in 1994. He is affiliated with numerous associations and societies, including the American Institute of Aeronautics and Astronautics, where he served as the President from 1997-98.

In the 1980's Aldridge was at one time an astronaut-in-training in preparation for his participation as a payload specialist on the first planned mission from Vandenberg Air Force Base, Calif., which was canceled because of the Challenger

accident.

Aldridge was born in Houston in 1938 and spent his youth in Shreveport, La. He earned his bachelor's degree in Aeronautical Engineering from Texas A&M University in 1960 and a master's degree in Aeronautical Engineering from Georgia Tech in 1962.

In his resignation letter to the President, Aldridge discussed the theme of "Acquisition Excellence" that he formulated during his nomination and confirmation, and the five goals he sought to accomplish during his tenure at the Department of Defense:

"First, I wanted to improve the credibility and effectiveness of the acquisition and logistics support process. Second, I wanted to improve the morale and quality of the acquisition workforce. Third, I wanted to improve the health of the defense industrial base. Fourth, I needed to support the decision process rationalizing our weapon systems and defense infrastructure with our new defense strategy. And fifth, I wanted to initiate those high-leverage technologies that would provide the war-winning capabilities of the future."

Aldridge summarized, "All in all I think we have made significant progress on accomplishing these five goals and setting in place the acquisition, technology and logistics support activities that you and Secretary Rumsfeld want to have for DoD."

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

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If you are an expert on one or more topics and are willing to referee articles for the ARQ, email norene.fagan-blanch@dau.mil.

DAU Course Application— Get the Latest Facts

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- Defense industry employees working on DoD contracts apply under their own category.
- Foreign personnel registering under a Foreign Military Sales process apply under a special category. Email Art McCormick at arthur.mccormick@dau.mil if you have questions.

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Go to www.dau.mil and click on *Enroll Here*. Apply for all courses at this site, including distance learning and hybrid courses.

HOW DOES THE APPLICATION PROCESS WORK?

Each DoD Military Service, e.g., Army, Navy, etc., is assigned quotas in DAU classes. Each agency, including non-DoD, has a specific training office that acts on applications. Each agency, including DoD non-military departments, funds training costs, such as TDY, assists with TDY orders, places its students in a wait or reservation status, or may disapprove an application. Students should contact their agency's POC if they have questions about the status of their application, why they are on a wait list, or how they should prepare their TDY orders. The POC list can be found at www.dau.mil/registrar/apply.asp at the bottom of the page.

HOW MUCH DO COURSES COST?

At this time, DAU does not charge tuition for its courses, except for foreign students who register under a Foreign Military Sales process. This category of foreign student, Department of Transportation-related agencies, industry, and non-DoD federal employees fund their own students' travel and per diem costs. For military and civilian DoD employees, there are no travel or per diem costs to the student or the student's agency to attend DAU courses as long as the proper procedures are followed. The Director, Acquisition Career Management Office (DACM) associated with each DoD agency will cover these costs, and students need to follow their processes.

WHAT ARE CLASS MODES?

Web-enabled courses are strictly computer-based training. The course schedule shows classes running from Oct. 1 to Sept. 30 since enrollment is constant throughout the fiscal year. Once approved for the course, students have 60 days to complete it, 28 days for BCF-102, 90 days for CON-101. After applying, students will receive various messages from "the system," including log on and password information. Students won't be able to log on until they receive a message saying they have a confirmed registration. Students will receive a message telling them whom to contact in case of technical difficulties or questions for an instructor. These messages should be saved for future reference.

Hybrid courses are composed of a Web-enabled phase, lasting about 45 days, followed a couple weeks later by a classroom phase lasting 5 days, except for PMT-352 which lasts 6 weeks. Students must apply for the B phase of a hybrid. They will automatically be enrolled in phase A when they receive a reservation in phase B. Students won't be able to start phase A until about 60 days before phase B starts (45 days for phase A plus 15 days after the Web-enabled phase ends and the classroom phase begins). This is done because the instructor wants the knowledge students acquired in phase A to be fresh in mind when they arrive to class. Students will receive a message telling them whom to contact in case of technical difficulties or questions for an instructor. These messages should be saved for future reference.

On-site or Residential Courses are traditional classroom courses. On-site courses are conducted at sites outside of the DAU campus network. Residential classes are held at a DAU regional campus.

HOW TO CONTACT THE DAU REGISTRAR?

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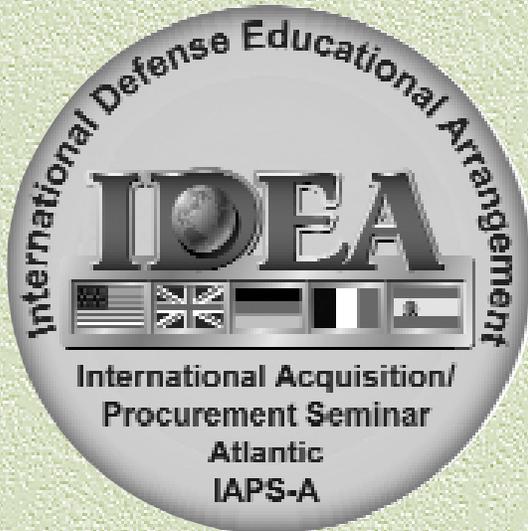


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Fifteenth Annual International
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Sponsored by the International Defense
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Visit our Web site:

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The Fifteenth Annual Acquisition/Procurement Seminar—Atlantic (IAPS-A) will include industry and government presentations and case-based learning, to allow a robust, positive exchange of information and feedback. The theme of the seminar will be “Interoperability in the International Environment.”

The seminar is sponsored by the International Defense Educational Arrangement (IDEA), which consists of defense acquisition educational institutions in the United States, the United Kingdom, Germany, France, and Spain.

Those eligible to attend are Defense Department/Ministry and defense industry employees from the four sponsoring nations who are actively engaged in international defense acquisition programs. Other nations may participate by invitation.

This year's seminar will be held June 23-27, 2003, at DAU/DSMC, Fort Belvoir, Va. The last day of the seminar, June 27, will be dedicated to the educational aspects of international acquisition.

Participants will be responsible for their own travel and hotel arrangements and expenses. There will be a registration fee of \$125.00 (cash or U.S. check only) for attending the seminar. This will be collected on the first day of registration. While the seminar is unclassified, international participants must obtain a visit clearance through their embassy.

Invitations, confirmations, and administrative instructions will be issued after May 1, 2003.

To register for the seminar, please go to the DAU Web site at http://www.dau.mil/international/international_15.htm.

Contact an IDEA Team member for additional seminar information:

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A COMPARISON OF THE DEFENSE ACQUISITION SYSTEMS OF AUSTRALIA, JAPAN, SOUTH KOREA, SINGAPORE, AND THE UNITED STATES

Author: Stefan Markowski

Editor: Tony Kausal

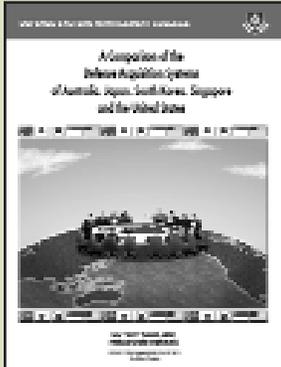
This guidebook describes the national armament systems of Australia, Japan, South Korea, Singapore, and the United States. Beginning with an introduction to the political environment, the acquisition organizations, systems, and processes involved, Kausal and Markowski describe the effects of differences in national culture and traditions, time zones, currencies, fiscal year schedules, and language barriers. Tying these differences to each nation's national armament system, the authors make the case that international armaments cooperation is a difficult but rewarding challenge.

Online

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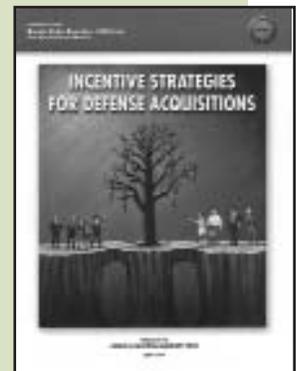
To request a printed copy of *Acquisition Guide for Interactive Electronic Technical Manuals* (September 1999), choose one of three options: 1) Fax a written request to the DAU Publications Distribution Center at (703) 805-3726; 2) mail your request to Defense Acquisition University, Attn: OP-CI, 9820 Belvoir Road, Suite 3, Fort Belvoir VA 22060-5565; or 3) e-mail jeff.turner@dau.mil.

INCENTIVE STRATEGIES FOR DEFENSE ACQUISITIONS GUIDE

Printed on behalf of the Office of the Deputy Under Secretary of Defense for Acquisition Initiatives by the Defense Acquisition University Press

Incentives should exist in every business arrangement because they maximize value for all parties. DoD needs to adopt strategies that attract, motivate, and reward contractors to encourage successful performance. Using commercial practices will enhance DoD's ability to attract nontraditional contractors. This guide amplifies existing policy regarding use of incentives in defense acquisitions. It explores cost-based and noncost-based incentive strategies. It clearly defines use of performance objectives or product functionality vs. detailed requirements to seek best value acquisitions. It answers these questions:

- Why are we concerned with contractual incentives?
- What elements contribute to an effective incentive strategy?
- How can we build and maintain an effective environment for a successful business relationship?
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ACQUISITION GUIDE FOR INTERACTIVE ELECTRONIC TECHNICAL MANUALS

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PERFORMANCE-BASED SERVICE ACQUISITION IN THE DEPARTMENT OF DEFENSE

Printed on behalf of the Office of the Deputy Under Secretary of Defense for Acquisition Reform by the Defense Acquisition University Press, March 2001

The Department of Defense has the responsibility to acquire services with the most efficient practices and processes. Performance-Based Service Acquisition (PBSA) strategies strive

to adopt best commercial practices. They provide the means to reach world-class commercial suppliers, gain greater access to technological innovations, maximize competition, and obtain the best value to achieve greater savings and efficiencies.

This handbook highlights key elements of PBSA, investigates the use of market research, introduces the performance-based work statement, and establishes measurable performance standards. It covers incentives and remedies, using assessment and quality control plans, and it enumerates evaluation factors of source selection. Finally it discusses contract administration, particularly in regard to post-award orientation and documentation of contractor performance.

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TEST AND EVALUATION MANAGEMENT GUIDE

4th Ed., November 2001

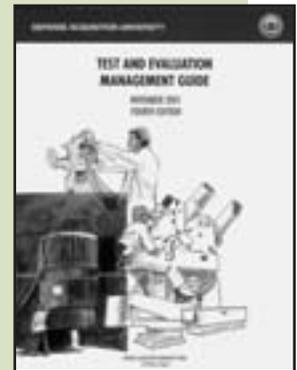
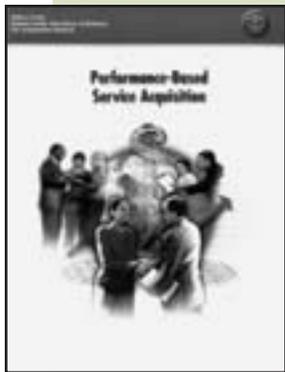
The objective of a well-managed T&E program is to provide timely and accurate information. This guide has been developed to assist the acquisition community in obtaining a better understanding of whom the decision makers are and determining how and when to plan test and evaluation events. The guide is written for current and potential acquisition management personnel who are familiar with basic terms and definitions employed in program offices.

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Pentagon Officials Tell Congress Missile Defense System “Moving Forward”

ARMY SGT. 1ST CLASS DOUG SAMPLE

WASHINGTON, March 21, 2003—Faced with the threat by North Korea of a nuclear warhead reaching the United States, senior Pentagon officials told the House Armed Services Committee March 20 they are moving forward with a billion-dollar missile defense system.

“We have achieved a number of successes in the missile defense test program, which have added momentum to the development effort and bolstered our confidence that we will be able to meet the challenges that lie ahead,” Edward C. “Pete” Aldridge Jr., Under Secretary of Defense for Acquisition, Technology and Logistics, told the committee.

Aldridge, joined on Capitol Hill by Thomas Christie, DoD Director for Operational Test and Evaluation, and J.D. Crouch II, Assistant Secretary of Defense for International Security Policy, testified on the progress of a missile defense testing facility in Alaska and on U.S. missile defense policy.

Last year, President Bush ordered the Pentagon to field a “hit to kill” missile defense capability by the year 2004. The United States currently has no defense against long-range missiles and limited defense against shorter-range missiles.

Aldridge said the Pentagon's confidence in the program lies in tests done by the Missile Defense Agency



A PAC-3 missile circa 1999 at White Sands, N.M. The PAC-3 missile greatly increases the effectiveness of the Patriot Air Defense System in negating tactical ballistic missiles, cruise missiles, and air-breathing threats.

Photo courtesy Lockheed Martin

(MDA), which has oversight of the program. Those tests, although criticized as being highly controlled, show promising results despite several misses.

In September, an Aegis sea-based theater defense radar aboard the cruiser *USS Lake Erie* was able to track all stages of a Minuteman III ICBM launched from Vandenberg Air Force Base, Calif. In October, the Navy destroyer *USS John Paul Jones* used its Aegis radar system in a test to track long-range target ballistic missile.

Overall, MDA has recorded four successful tests out of five for the long-range ground-based intercepts, and was three-for-three for the short- to medium-range sea-based intercepts. The agency was five out of seven for short-range ground-based intercepts, Crouch said.

“When tests have failed, we understand what went wrong and have taken measures to correct the problem,” Crouch said. “Some test failures are to be expected with advanced technology development programs.”

But the Pentagon cannot afford to fail in this program. North Korea has had an active ballistic missile program for years, Crouch testified.

“North Korea caught us by surprise when it launched its three-stage Taepo-Dong I space-launch vehicle/ballistic missile in August 1998,” he said. Now, he said, the Taepo Dong II long-range missile is capable of delivering a nuclear weapon-sized payload to parts of the United States and “could be flight-tested at any time,” he noted.

Crouch said that, according to the National Air Intelligence Center, the Taepo Dong II missile might be exported to other countries in the future. Iran and other countries also are working on space-launch vehicles and intercontinental-range ballistic missiles that could be ready for testing in the next few years, he said.

“We knew North Korea was developing longer-range missiles, but we were surprised at the presence of a third stage on the missile,” Crouch explained. “We have been surprised many times in the past by foreign ballistic missile developments. We likely will be surprised again in the future,” he added.

The problem for the Pentagon is that some in Congress believe the military is moving forward too fast on a costly, unproven missile defense system.

Christie said that he “understands and shares concerns raised by members of Congress” regarding the precedent of field operational systems without adequate testing. But he told the committee the MDA must move forward with completion of the test bed to further missile defense development.

“If we don't develop an operational concept and an attack comes, then we will have failed in a most serious way,” he told the committee.

The MDA says it will cost \$7.7 billion and \$8.7 billion over the next two fiscal years and about \$8 billion a year thereafter to run the program. The Pentagon began building a missile defense test site in Alaska last summer. It is scheduled for completion next year.

The Pentagon missile defense plan calls for 20 ground-based interceptors to protect against an intercontinental-range ballistic missile threat. Those missiles will be stored in silos at Fort Greeley, Alaska, and at Vandenberg.

Crouch said the United States has asked the United Kingdom and Denmark for permission to upgrade early warning radars in their countries to track ballistic missile threats from the Middle East.

“The U.K. has granted permission, and we look forward to hearing from Denmark later this year,” he said.

To address the medium-range threat, Crouch said three Navy Aegis-class ships will be equipped with up to 20 SM-3 Standard missiles.

“This will provide a highly mobile missile defense capability to help protect U.S. forces and allies and provide some limited protection for the U.S. homeland against shorter-range missiles launched from ships off our coasts,” Crouch said.

For short-range threats, Crouch said that Army would continue to field additional air-transportable and mobile Patriot Advanced Capability-3 missile units with up to 346 PAC-3 missiles and 42 PAC-3 radars. The PAC-3 missile is the first upgrade of the Patriot system to feature a “hit to kill” missile that can help defeat chemical and biological threats.

Editor's Note: This information is in the public domain at <http://www.defenselink.mil/news>.

DAU Alumni Association Celebrates Anniversary

Twenty Years of Value and Service to the Acquisition Community

SYLWIA GASIOREK-NELSON

For 20 years, the DAU Alumni Association (DAUAA)—a world-class association of acquisition professionals—has been actively working to provide value and service for its members. This year DAUAA will be celebrating its 20th anniversary during the Annual Symposium, to be held June 17-19 at DAU Headquarters, Capital and Northeast Regional campus, Fort Belvoir, Va. This year's theme—Delivering Warfighting Capabilities Today and Tomorrow through Evolutionary Acquisition—will serve as a review of the acquisition initiatives of today and tomorrow now foremost in the minds of the acquisition community.

Describing the value of the symposium, Frank Varacalli, DAUAA President said, "We'll use the symposium to bring life to the policies and emerging practices of Evolutionary Acquisition by exposing the attendees to DoD and Congressional leadership and to successful practitioners. As we have in the past, we'll present a series of workshops to complement the distinguished speakers."

2003 Symposium

This year's symposium will bring together a large diversified group of professionals from government and the defense industry, representing many career fields: program management, contracting, logistics, engineering, manufacturing, software, and test and evaluation. Also participating will be financial professionals, information technologists,



Senior acquisition executives attending the 2002 DAUAA Acquisition Symposium. From left: Michael Wynne, Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics); Frank Anderson Jr., DAU President; and John Phillips, Vice President for After Market Growth, Honeywell.

and senior defense and government executives as well as many distinguished speakers and panelists.

These include Heather Wilson, Congressional Representative, N.M.; Michael Wynne, Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics; Deidre A. Lee, Director, Defense Procurement and Acquisition Policy; Army Gen. Paul Kern, Commanding General, Army Materiel Command; Claude Bolton Jr., Assistant Secretary of the Army for Acquisition, Logistics and Technology;

John Young, Assistant Secretary of the Navy, Research, Development and Acquisition; Dr. Marvin Sambur, Assistant Secretary of the Air Force for Acquisition; Dr. Ronald M. Segal, Director, Defense Research and Engineering; Louis A. Kratz, Assistant Deputy Under Secretary of Defense for Logistics Plans and Programs; Frank Anderson, DAU President; Army Col. Ronald Flom, DAU Commandant; and many others.

The two-day event will provide a wide variety of workshops, seminars, and panels on several relevant topics:

Gasiorek-Nelson is a full-time editor for PM Magazine, DAU Press, Fort Belvoir, Va.

Suzanne D. Patrick, Deputy Under Secretary of Defense (Industrial Policy) at the 2002 DAUAA Acquisition Symposium.



- Contracting for Evolutionary Acquisition
- Congressional View on Evolutionary Acquisition
- Performance Based Logistics
- Research and Development and Evolutionary Acquisition

The DAUAA Annual Symposium is a great opportunity to network, to share and promote ideas, and to stay current with acquisition policies.

- Interoperability for the Future Combat System
- DoD Initiatives for Software Productivity
- The Defense-wide Information Assurance Initiative.

According to DAU Professor Wayne Glass, who is the current DAUAA Vice President for Operations, the symposium is a great opportunity to network, to share and promote

ideas, and to stay current with acquisition policies. "It's all about evolutionary acquisition and spiral development," Glass said. "These concepts are crucial to preserve the ability of systems to adapt to the changing needs of today's acquisition environment. It's all about capability—how to improve and how to sustain."

Other highlights of the annual event will include a special presentation to DAUAA Corporate Sponsors; the Acker Award presentation; a 20th Anniversary cake-cutting ceremony; and a Golf Tournament on June 16, which is a voluntary kick-off event, traditionally held in the afternoon on the day before the symposium.

About the DAUAA

Today, with the membership now over 1,250, the association is headed by Varacalli, an ardent supporter and friend of the Defense Acquisition University. Working closely with Glass, Varacalli runs the association with advice and counsel from elected officers, a board of



Mark Salesky (right), 2001 DAUAA President, presents the David Acker Award for Skill in Communication to Wynne at the 2002 DAUAA Acquisition Symposium.

directors, board of advisers, Service representatives, and a DAU Liaison.

DAUAA Goals

The main goal of the association is to focus on providing value and service to its members, on establishing and maintaining interpersonal networks, and on growing as the primary association of Defense Acquisition Professionals. "The goals for the future depend largely on what our membership tells us is important to them," said Varacalli. "I hope to maintain a continuing dialogue through improvements in our Web site and by working with the DAU regional centers and local chapters."

Of course, within those broad goals, the association has two primary objectives:

- To provide a means for continuing professional growth within the defense acquisition community.
- To promote DAU's reputation as a world-class acquisition learning center.

Corporate Sponsors

One of the greatest successes to date has been getting the Corporate Sponsor program off the ground. This initiative provides the broadest possible outreach in strengthening the partnership between the defense acquisition workforce and the defense industry.

"By becoming a sponsor," Varacalli explained, "companies can help us advance reciprocal learning opportunities, and can participate in developing the government and industry acquisition workforce to meet the accelerating needs of Evolutionary Acquisition." To date, the association has four Corporate Sponsors: Raytheon, Lockheed Martin, Boeing, and Northrop Grumman. Several more companies have indicated intent to become Corporate Sponsors.

Why Join?

DAUAA ANNUAL SYMPOSIUM

As one of the most significant events organized by DAUAA, and held annually at the DAU Headquarters, Fort Belvoir, Va., the symposium provides opportunities for DAUAA members to learn and

grow professionally. It also emphasizes the importance of networking, sharing knowledge, and learning from other's experiences in meeting the needs of the Continuous Learning workforce.

MONTHLY BROWN-BAG SEMINAR

The Capital Area Chapter (CAC) also sponsors monthly brown-bag seminars with leaders in defense acquisition. The association is also exploring the possibility of sponsoring smaller symposia in conjunction with the DAU regional centers.

"We are working with the DAU regional centers and campuses," said Varacalli, "to organize and support local chapters to enhance the Distributed Learning experience." This could also occur, he added, "at our new local chapters as they are established, as a means of strengthening our acquisition community."

THE ASSOCIATION HOME PAGE

The official DAUAA Web site at <http://www.dauaa.org> provides a source of information for its members and an opportunity to network with other members in the defense acquisition community. "Today, a wealth of information is available from the Internet through extremely powerful search engines," Varacalli noted. "Our mission is to try and focus some of that information for our members and to promote an exchange of ideas. We're far from that goal, and we're seeking input on how we might best succeed."

One of the new items on the DAUAA site is the *Employment Opportunities* link, which posts selected job opportunities available only to association members. The association is also exploring the possibility of a resume or job search feature.

ACCESS TO DAU'S ACKER LIBRARY

The DAU Acker Library supports the curriculum of the DAU and its research in defense acquisition. The library maintains an extensive collection of books, newspapers, and journals in the field of management, with special emphasis on defense systems acquisition management. Full borrowing privileges

DAU Alumni Association— In The Beginning

On Oct. 20, 1983, graduates of many Defense Systems Management College courses met at the College to establish a DSMC Alumni Association. Army Brig. Gen. Benjamin J. Pellegrini, then DSMC Commandant, enthusiastically endorsed the idea and expressed the support of DSMC management. The 60 graduates at the initial meeting received endorsements from many graduates unable to attend.

A draft of the constitution was presented by the organizers for review and comment by attendees. Based on comments received, the constitution was completed and approved by the first Board of Directors of the DSMC Alumni Association on Dec. 9, 1983.

Professor Joanne L. Barreca, a graduate of PMC 83-1 and member of the DSMC Policy and Organization Department faculty, was named the first president. Retired Air Force Lt. Col. Frederick W. Wynn, a graduate of PMC 71-1 (the first class), and later a DSMC faculty member, was the first vice president.

The Alumni Association planned to conduct a symposium annually, normally in June, to discuss changes to the acquisition process and its management as well as DSMC matters. A yearly business meeting of the association would be held in conjunction with the symposium.

By the end of 1985, the membership was approaching 1,000. Today it numbers over 1,250 members.

In 2001, the DSMC Alumni Association (DSMCAA) officially changed its name to the Defense Acquisition University Alumni Association (DAUAA).



Frank Varacalli (second from right), current DAUAA President, accepts a \$2,500 sponsorship check on behalf of DAUAA from Raytheon, DAUAA's first corporate sponsor. The presentation was made during a Defense Industry Training Roundtable, held at DAU Headquarters, Fort Belvoir, Va., on Nov. 20, 2002. Presenting the check is Raytheon representative Curt Newell (second from left). Also participating in the presentation are Frank Swofford (left), DAU Industry Chair; and DAU Professor Bill Bahnmaier (right), who serves as the current Vice President for Membership, DAUAA.

are restricted to current faculty, staff, and students; however, alumni may register for weekend borrowing—a privilege extended to few others.

The library is also available online at <http://library.dau.mil> and is an open Web site, which offers a complete selection in the catalog. Additionally, the site offers helpful library-type services such as help desk, links to the most common databases, learning resource center, and many other library links.

NEWSLETTER

This monthly online publication keeps the association membership informed of current happenings in the acquisition community, current events at the Defense Acquisition University and its Regions, and other activities of interest to members of the organization. Emphasizing the importance of the newsletter, Glass said, “We’ve started an electronic news update and our focus there is to give our members a ‘heads-up’ on important events and activities within the acquisition commu-

nity, as well as provide news from DAU Headquarters and regional campuses.”

Along these lines, the association is also facilitating the subscription process for *Program Manager* and *Acquisition Review Quarterly*. The DAUAA Web site provides a link to the DAU Web site, where postage-free subscription forms are available at http://www.dau.mil/forms/subscribe_form.pdf.

DAUAA AWARDS PROGRAM

The awards program established by the association is linked to its objectives and recognizes success and initiative in promoting and advancing the acquisition profession. The awards program recognizes three constituencies: the members of the association, the directors who manage its daily affairs, and the broader acquisition community from which the association draws support and to whom it provides support.

The **David Acker Award** is the most prestigious of the association awards,

and is presented annually to the individual who, in the opinion of the 16 elected directors, has most influenced the course of acquisition innovation and excellence by his or her skill in communication.

The award consists of a bronze full-face relief of David Acker, encircled by a ring bearing the name of the award and the association's name. Recent recipients include: Michael W. Wynne, Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics (2002); Dr. George R. Schneider, Director, Strategic and Tactical Systems, Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (2001); and Chuck Cochrane, Department Chair, Acquisition Policy Department, DSMC (2000).

DAUAA MEMBERSHIP

The *Regular* membership category is open to graduates of all DAU courses (and respective faculties of DAU). The *Associate* membership category is for those in government and industry who are currently serving, or who have previously served, in defense acquisition program management positions, but who do not qualify for Regular membership. More information on becoming a member is available at <http://www.dauaa.org>.

We Invite You to Join

From the Alumni Association's rich beginnings, it has worked hard to provide services that reflect the needs and concerns of acquisition professionals. As described in this article, the DAUAA Annual Symposium is just one of the resources and benefits made available to association members.

You are invited to become a part of this fine organization, and DAUAA is looking forward to seeing all of you at the symposium. In an appeal to current and potential members, Varacalli said, “We need ideas and the energy that new members bring. We’re always searching for ways to make the symposia relevant and for committee volunteers to make it happen.”



The acquisition ladder is a tough climb without the right education...DAU.

When was the last time you or one of your associates attended one of the 85 different acquisition courses offered by the Defense Acquisition University at one of its 12 locations around the country?

Did you know industry personnel may also attend?

Are you current on the DoD 5000-series cancellations and revisions? Do you know the latest acronyms and terms?

When was the last time you or your associates took an introductory, intermediate, or advanced course in acquisition, technology and logistics?

Did you know that DAU now offers 18 certification courses that are taught entirely or in part using distance learning? Or check out one of the 41 self-paced learning modules now on our Continuous Learning Center Web site (<http://clc.dau.mil/>).

We also offer fee-for-service consulting and research programs. And take advantage of our competitively priced conference facilities.

Maybe it's time to talk to your training officer about some additional training opportunities. Or call the DAU Registrar at 1-888-284-4906 to see how we can structure an educational program just for you.

Visit the DAU Web site for the DAU 2003 Catalog and other publications at <http://www.dau.mil>. To apply for all DAU classes in the catalog, including Distance Learning classes, go to <http://www.dau.mil> and visit the DAU Course Schedule. To apply for a course, click on the "Enroll Here" link found in the DAU Home Page banner.



Aldridge Appoints Domain Owners



ACQUISITION,
TECHNOLOGY AND
LOGISTICS

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3010

17 MAR 2003



MEMORANDUM FOR UNDER SECRETARY OF DEFENSE (COMPTROLLER)

SUBJECT: Appointment of Domain Owners to Support Implementation of
Financial Management Enterprise Architecture (FMEA)

In support of the FMEA governance structure, I hereby appoint the following executives
as Domain Owners:

- Logistics — Honorable Diane K. Morales, DUSD(L&MR)
- Installations and Environment — Mr. Raymond F. DuBois, DUSD(I&E)
- Acquisition/Procurement — Ms. Deidre A. Lee, DIR(DPAP)

The AT&L Domain Owners will be responsible for implementing the Financial
Management Enterprise Architecture within their respective domains. I look forward to
hearing their progress on this important Departmental effort.


E.C. Aldridge, Jr.

Editor's Note: This information is in
the public domain at the Director,
Defense Procurement and Acquisition
Policy Web site:
<http://www.acq.osd.mil/dpap/>.



Fresh Ideas, Shared Experiences, New Partnerships

Honoring 12 Exceptional Mentor-Protégé Teams

SYLWIA GASIOREK-NELSON

Teams of Department of Defense prime contractors and their protégés from Small, Disadvantaged Businesses (SDB) were honored with the Nunn-Perry Award during the annual DoD Mentor-Protégé Conference, held March 17-19 in Crystal City, Va.

Presenting the awards this year were Frank Ramos, Director, Office of Small and Disadvantaged Business Utilization; H. C. "Barney" Barnum Jr., Deputy Assistant Secretary of the Navy (Reserve Affairs); George T. Schultz, DoD Mentor-Protégé Program Manager; and retired Korean War Veteran, Army Cpl. Rodolfo "Rudy" P. Hernandez.

Emphasizing the importance of DoD's Mentor-Protégé Program, Schultz said, "We are here to celebrate the success of a proven program, recognize mentors and protégés, and witness the growth of significant partnerships—all made possible by the DoD Mentor-Protégé Program. The success of the program continues to accrue through the energies of good people building strong mentors and protégés under the auspices of the Department of Defense. I take this opportunity to salute all of you."

In his keynote speech, Barnum recognized the significance of teamwork. "Those in corporate America are helping so the job will be done. And only together as teams—not as superstars, but as teams—we're all being successful," he said.

Frank Ramos, Director, Office of Small & Disadvantaged Business Utilization, delivers closing remarks.



Keynote speaker, H.C. "Barney" Barnum Jr., Deputy Assistant Secretary of the Navy (Reserve Affairs).

Gasiorek-Nelson is a full-time contract editor for PM Magazine, DAU Press, Fort Belvoir, Va.

Comparing corporate leadership to the Marine Corps, Barnum said that it's like taking care of the troops, guiding the men and women to realize mission accomplishment, bringing out the best in them, assisting them in setting their goals—goals important for the whole team.

The results of leadership and mentoring, he added, are equal. "That's what this Mentor-Protégé program is all about—helping people to prepare for the many responsibilities they'll assume as they progress in their careers."

Commending this year's award winners, Barnum said, "I congratulate all those who are being recognized this morning for their drive, determination, and enthusiasm, which has resulted in realizing mission accomplishment. The partnership between the mentors and

winners today have become the flagship award winners of the year."

Expressing gratitude to all who supported the program, Ramos emphasized that the challenge today is to develop stronger and more versatile protégés in order to meet the needs of the Department of Defense. "Thank you for your program support, which we will need on a continuing basis. Congratulations to all of the winning teams," he said.

And the Award Goes to ...

The recipients of the Nunn-Perry Award were selected based on each mentor-protégé team's success in achieving cost-efficiencies, enhancing each protégé's technical capabilities, and increasing prime contracting and subcontracting awards to SDBs. This year's winners:

- Government Solutions, Inc.
- Terradigm, Inc.
- Earth Tech, Inc.—Bhate Environmental Associates, Inc.
- Electronic Data Systems—Force 3, Inc.
- HydroGeoLogic, Inc.—MicroPact Engineering, Inc.
- Manufacturing Technology, Inc.—General Precision Manufacturing Inc.
- Q.E.D. System, Inc.—LPI Technical Services
- Raytheon Missile Systems—The ENSER Corporation
- Science Applications International Corporation—Command Technologies, Inc.
- Shaw Environmental & Infrastructure—Advent Environmental, Inc.
- Shaw Environmental & Infrastructure, Inc.—EM Federal Corporation
- Hamilton Sundstrand Corporation—Aimco Precision, Inc.
- Northrop Grumman Space Technology—Upper Mohawk, Inc.

Nunn-Perry Award

The Nunn-Perry Award is named in honor of both former Senator Sam Nunn, who sponsored legislation to create the Defense Department's Mentor-Protégé Program, and former Secretary

of Defense William Perry in recognition of his implementation of the program.

This award recognizes mentor-protégé teams that have excelled in technical developments, cost efficiencies, and increased business opportunities for SDBs.

The DoD's Mentor-Protégé Program, which began in 1991, is a national initiative to encourage large defense contractors to develop the technical capabilities of SDBs. It also qualifies



George Schultz, DoD Mentor-Protégé Program Manager, delivers welcoming remarks.

protégés," he emphasized, "has truly produced powerful, beneficial, and rewarding results."

Concluding the ceremony Ramos said, "I'm pleased to report that our Mentor-Protégé program has become the flagship small business program within the Federal Government and that our award

The Nunn-Perry Award is named in honor of both former Senator Sam Nunn, who sponsored the Mentor-Protégé Program legislation, and former Secretary of Defense William Perry in recognition of his implementation of the program.

organizations employing the severely disabled to compete more effectively for defense-related work.

Editor's Note: To learn more about the Mentor-Protégé program, visit the DoD Mentor-Protégé Program Web site at <http://www.acq.osd.mil/sadbu/programs/index.htm>.

2003 NUNN-P

Government Solutions, Inc.—Terradigm, Inc.



Mentor: Government Solutions, Inc., Vienna, Va. **Protégé:** Terradigm, Inc., Albuquerque, N.M.

Earth Tech, Inc.—Bhate Environmental Associates, Inc.



Mentor: Earth Tech, Inc., Long Beach, Calif. **Protégé:** Bhate Environmental Associates, Inc., Birmingham, Ala.

Electronic Data Systems—Force 3, Inc.



Mentor: Electronic Data Systems, Herndon, Va. **Protégé:** Force 3, Inc., Crafton, Md.

HydroGeoLogic, Inc.—MicroPact Engineering, Inc.



Mentor: HydroGeoLogic, Inc., Herndon, Va. **Protégé:** MicroPact Engineering, Inc., Herndon, Va.

Manufacturing Technology, Inc.—General Precision Manufacturing Inc.



Mentor: Manufacturing Technology, Inc., Fort Walton Beach, Fla. **Protégé:** General Precision Manufacturing, Inc., Pensacola, Fla.

Q.E.D. System, Inc.—LPI Technical Services



Mentor: Q.E.D. System, Inc., Virginia Beach, Va. **Protégé:** LPI Technical Services, Chesapeake, Va.

ERRY AWARDS

Raytheon Missile Systems—The ENSER Corporation



Mentor: Raytheon Missile Systems, Tucson, Ariz. **Protégé:** The ENSER Corporation, Pinellas Park, Fla.

Science Applications International Corporation—Command Technologies, Inc.



Mentor: Science Applications International Corporation, McLean, Va. **Protégé:** Command Technologies, Inc., Warrenton, Va.

Shaw Environmental & Infrastructure—Advent Environmental, Inc.



Mentor: Shaw Environmental & Infrastructure, Inc., Baton Rouge, La. **Protégé:** Advent Environmental, Inc., Mt. Pleasant, S.C.

Shaw Environmental & Infrastructure, Inc.—EM Federal Corporation



Mentor: Shaw Environmental & Infrastructure, Inc., Baton Rouge, La. **Protégé:** EM Federal Corporation, Centreville, Va.

Hamilton Sundstrand Corporation—Aimco Precision, Inc.



Mentor: Hamilton Sundstrand Corporation, Rockford, Ill. **Protégé:** Aimco Precision, Inc., Phoenix, Ariz.

Northrop Grumman Space Technology—Upper Mohawk, Inc.



Mentor: Northrop Grumman Space Technology, Redondo Beach, Calif. **Protégé:** Upper Mohawk, Inc., Beaver Creek, Ohio.

DoD Announces Plans to Stimulate Undergraduate Research

WASHINGTON (March 14, 2003)—The Department of Defense (DoD) today announced plans to award 19 grants, totaling \$4.7 million, that will support approximately 650 undergraduate students, in its first annual Awards to Stimulate and Support Undergraduate Research Experiences (ASSURE) program. The ASSURE program will be executed collaboratively with the National Science Foundation (NSF) through its Research Experiences for Undergraduates (REU) Sites Program. All awards are subject to the successful completion of negotiations between DoD, NSF, and the grantee institutions.

Undergraduate programs are critical to DoD's overall education investment strategy. The ASSURE program supports undergraduate research in DoD-relevant disciplines and is designed to increase the number of high-quality undergraduate science and engineering majors. ASSURE serves as a complementary program to the DoD National

Defense Science and Engineering Graduate (NDSEG) Fellowship Program for graduate students in science and engineering.

ASSURE aims to provide valuable research opportunities for undergraduates, typically through an eight- to 10-week summer research program, located at the grantee's institution. The program often draws students from institutions where access to research opportunities is limited. The program also emphasizes the recruitment of women and under-represented minorities.

Today's announcement is the result of a merit competition conducted by NSF in partnership with DoD. ASSURE grants will be used mainly for three-year sites, although a few sites will have a five-year duration.

Editor's Note: This DoD News Release is in the public domain at <http://www.defenselink.mil/news>.

UNIVERSITIES SELECTED FOR RESEARCH FUNDING

WASHINGTON (March 12, 2003)—The Department of Defense (DoD) today announced plans to award 17 grants to universities selected for research funding. The grants total approximately \$8.5 million in fiscal year 2003 and up to \$17 million per year starting in fiscal year 2004. Sixteen academic institutions will receive the grants to conduct multidisciplinary research in 12 topic areas of basic science and engineering. These grants will be made under the DoD Multidisciplinary University Research Initiative (MURI) program. All awards are subject to the successful completion of negotiations between DoD research offices and the academic institutions.

MURI is a program designed to address large multidisciplinary topic areas representing exceptional opportunities for future DoD applications and technology options. The awards will provide long-term support for research, graduate students, and laboratory instrumentation development that supports specific science and engineering research themes vital to national defense.

The average award will be \$1 million per year over a three-year period. Two additional years of funding will be possible as options to bring the total award to five years. Out-year funding is subject to satisfactory progress in the research and the availability of funding appropriations.

Today's announcement is the result of a rigorous merit competition over many months under the DoD MURI program. In response to the MURI broad agency announcement solicitation, many letters of intent to submit proposals were received leading to 83 full proposals requesting \$497 million for multidisciplinary research. After a thorough evaluation by DoD technical expert teams, 17 of these proposals were found to be suitable for funding.

Editor's Note: The list of projects selected for fiscal year 2003 funding may be found on the Web at <http://www.defenselink.mil/news>.

ATTENTION

BECOME A DEFENSE ACQUISITION UNIVERSITY ALUMNI ASSOCIATION

CORPORATE SPONSOR

In the past, defense industry organizations and personnel have needed, but not always received, the same acquisition training and education opportunities that are currently offered by the Defense Acquisition University (DAU) to government employees. The DAU Alumni Association (DAUAA) has recently begun a Corporate Sponsorship program to help DAU fill that gap. This program envisions a more balanced approach to education and training that will be mutually beneficial to both industry and the government.

Raytheon, Lockheed-Martin, Northrop Grumman, Boeing, and Rockwell-Collins have already become DAUAA Corporate Sponsors. We hope to add you as a sponsor in 2003.

Corporate Sponsorship of the DAUAA is open to any defense industry firm that practices business according to federal and state laws that prohibit discriminatory practices. Sponsors cannot be companies with whom U.S. law prohibits conducting DoD business. Foreign governments or their agents cannot participate in DAUAA sponsorship.

For a nominal consideration/fee, your company receives these benefits:

- Up to 20 annual memberships are allocated for each Corporate Sponsor. Employees chosen by the sponsor will receive an annual DAUAA Associate Membership at no extra cost.
- Preferential formal and social opportunities at DAUAA's Annual Acquisition Symposium at the Capital and Northeast Region campus, Fort Belvoir, Va.

- Employees of a sponsor may attend the symposium at the discounted member rates.
- Sponsors will receive a reserved exhibit space at no cost.
- Program participation opportunities for both individual speakers and panel participation is offered preferentially to sponsors, although the DAUAA reserves the right to select program speakers based on the overall structure of the symposium.
- Sponsoring companies may have their name and logo in the annual symposium program and/or handouts.
- Sponsor executives will be offered seating in proximity to invited DoD officials at plenary sessions and meals.
- Your company is featured on the DAUAA Web site (<http://www.dauaa.org>), with a one-page description of your company, its products and services. (Note: DAUAA is prohibited by IRS rules from advertising or endorsing specific products or services, so it reserves the right to withhold all or part of the description not compliant with IRS rules.)

Sponsorship status becomes effective the date of receipt of your application, along with the nominal consideration/fee. DAUAA is a non-profit organization, and sponsorship contributions are tax deductible. DAUAA reserves the right to change or expand benefits at any time when approved by the governing DAUAA Board of Directors.

Although this sponsorship program is still in its early stages, companies are already inputting ideas and suggestions into planning for the June 2003 DAUAA Symposium.

MARK YOUR CALENDARS NOW FOR THE
DEFENSE ACQUISITION UNIVERSITY ALUMNI ASSOCIATION
20TH ANNUAL ACQUISITION SYMPOSIUM

JUNE 17-18, 2003, SCOTT HALL, FORT BELVOIR, VA.



Call for Papers

Precision Strike Technology Symposium 2003

Desired Topics

Weapons
Effects
C4ISR
Targeting
Strike Transformation
Coalition Warfare

The Precision Strike Association will sponsor its thirteenth annual Precision Strike Technology Symposium on 14-16 October 2003 at the Kosiakoff Conference Center of The Johns Hopkins University Applied Physics Laboratory, Laurel MD.



**PRECISION STRIKE
ASSOCIATION**
Affiliate, National Defense
Industrial Association

Individuals desiring to present a paper are required to submit an abstract no later than Friday, June 6, 2003. Presentations may be to the SECRET level. Abstracts must be UNCLASSIFIED, non-marketing, address-relevant technologies applicable to the symposium topics, and be no longer than 500 words. Innovative concepts and ideas are particularly welcomed, and multimedia presentations are strongly encouraged.

Abstracts for proposed papers are to be sent to the Precision Strike Association by:

E-mail: info@precisionstrike.org (preferred)
Fax: 301-475-9367
Mail: Precision Strike Association
P.O. Box 1606
Leonardtown MD 20650

Requirements & Schedule

Papers should be suitable for a 20-minute presentation. Abstracts should include the intended classification of the paper and must include the point of contact, complete address, e-mail, telephone, and fax number. Specific format requirements will be provided to those individuals whose abstracts are selected.

The following schedule applies:

June 6

Deadline for Abstracts

Week of July 7

Acceptance Notification Sent by E-mail

Oct. 14-16

Symposium

Papers should address advanced technologies and Out-of-the-Box concepts that will help achieve the goals of Precision Engagement throughout the full range of military operations.

Inquiries For questions, contact Leslie Mueller at 301-475-6513 or via e-mail at info@precisionstrike.org

PSTS 2003

Acquisition & Logistics Excellence

An Internet Listing Tailored to the Professional Acquisition Workforce

Surfing the Net

Department of Defense

Under Secretary of Defense (Acquisition, Technology and Logistics) (USD(AT&L))

<http://www.acq.osd.mil/>

ACQWeb offers a library of USD(AT&L)

documents, a means to view streaming videos, and jump points to many other valuable sites.

Director, Defense Procurement and Acquisition Policy (DPAP)

<http://www.acq.osd.mil/dpap>

Procurement and Acquisition Policy news and events; reference library; DPAP organizational breakout; acquisition education and training policy and guidance.

DoD Inspector General

<http://www.dodig.osd.mil/pubs/index.html>

Search for audit and evaluation reports, Inspector General testimony, and planned and ongoing audit projects of interest to the acquisition community.

Deputy Director, Systems Engineering, USD (AT&L/IO/SE)

<http://www.acq.osd.mil/io/se/index.htm>

Systems engineering mission; Defense Acquisition Workforce Improvement Act information, training, and related sites; information on key areas of systems engineering responsibility.

Defense Acquisition Deskbook

<http://deskbook.dau.mil>

Automated acquisition reference tool covering mandatory and discretionary practices.

Defense Acquisition History (DAH) Project

<http://www.army.mil/cmhpg/acquisition/acqhome.htm>

The DAH Project is a multi-year program to produce a detailed history of defense acquisition since 1947, to be published in six volumes. The site features a quarterly online newsletter, project status announcements, acquisition history links, and contact information.

Defense Acquisition University (DAU)

<http://www.dau.mil>

DAU Course Catalog, *Program Manager* magazine and *Acquisition Review Quarterly* journal; course schedule; policy documents; guidebooks; and training and education news for the Defense Acquisition Workforce.

Defense Acquisition University Distance Learning Courses

<https://dau.mil/registrar/apply.asp>

Take DAU courses online at your desk, at home, at your convenience!

Army Acquisition Corps (AAC)

<http://dacm.rdaisa.army.mil>

News; policy; publications; personnel demo; contacts; training opportunities.

Army Acquisition

<http://acqnet.saalt.army.mil>

A-MART; documents library; training and busi-

ness opportunities; past performance; paperless contracting; labor rates.

Navy Acquisition Reform

<http://www.ar.navy.mil>

Acquisition policy and guidance; World-class Practices; Acquisition Center of Excellence; training opportunities.

Navy Acquisition, Research and Development Information Center

<http://hardic.onr.navy.mil>

News and announcements; acronyms; publications and regulations; technical reports; "How to Do Business with the Navy"; much more!

Naval Sea Systems Command

<http://www.navsea.navy.mil>

Total Ownership Cost (TOC); documentation and policy; Reduction Plan; Implementation Timeline; TOC reporting templates; Frequently Asked Questions.

Navy Acquisition and Business Management

<http://www.abm.rda.hq.navy.mil>

Policy documents; training opportunities; guides on areas such as risk management, acquisition environmental issues, past performance, and more; news and assistance for the Standardized Procurement System (SPS) community; notices of upcoming events.

Navy Best Manufacturing Practices Center of Excellence

<http://www.bmpcoe.org>

A national resource to identify and share best manufacturing and business practices being used throughout industry, government, and academia.

Naval Air Systems Command (NAVAIR)

<http://navair.navy.mil>

Provides advanced warfare technology through the efforts of seamless, integrated, worldwide network of aviation technology experts.

Space and Naval Warfare Systems Command (SPAWAR)

<https://e-commerce.spawar.navy.mil>

Your source for SPAWAR business opportunities, acquisition news, solicitations, and small business information.

Joint Interoperability Test Command (JITC)

<http://jitc.fhu.disa.mil>

Policies and procedures for interoperability certification. Access to lessons learned; link for requesting support.

Air Force (Acquisition)

<http://www.safaq.hq.af.mil/>

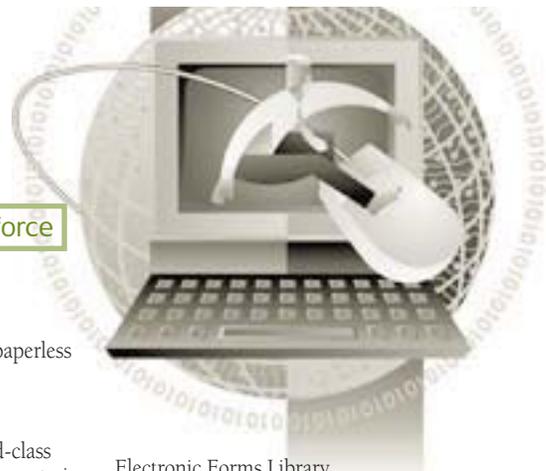
Policy; career development and training opportunities; reducing TOC; library; links.

Air Force Materiel Command (AFMC)

Contracting Laboratory's Federal Acquisition Regulation (FAR) Site

<http://farsite.hill.af.mil/>

FAR search tool; *Commerce Business Daily* Announcements (CBDNet); Federal Register;



Electronic Forms Library.

Defense Systems Management College (DSMC)

<http://www.dau.mil>

DSMC educational products and services; course schedules; job opportunities.

Defense Advanced Research Projects Agency (DARPA)

<http://www.darpa.mil>

News releases; current solicitations; "Doing Business with DARPA."

Defense Information Systems Agency (DISA)

<http://www.disa.mil>

Structure and mission of DISA; Defense Information System Network; Defense Message System; Global Command and Control System; much more!

National Imagery and Mapping Agency

<http://www.nima.mil>

Imagery; maps and geodata; Freedom of Information Act resources; publications.

Defense Modeling and Simulation Office (DMSO)

<http://www.dmsomil>

DoD Modeling and Simulation Master Plan; document library; events; services.

Defense Technical Information Center (DTIC)

<http://www.dtic.mil/>

Technical reports; products and services; registration with DTIC; special programs; acronyms; DTIC FAQs.

Defense Electronic Business Program Office (DEBPO)

<http://www.defenselink.mil/acq/ebusiness/>

Policy; newsletters; Central Contractor Registration; Assistance Centers; DoD EC Partners.

Open Systems Joint Task Force

<http://www.acq.osd.mil/osjtf>

Open Systems education and training opportunities; studies and assessments; projects, initiatives and plans; reference library.

Government-Industry Data Exchange Program (GIDEP)

<http://www.gidep.corona.navy.mil>

Federally funded co-op of government-industry participants, providing an electronic forum to exchange technical information essential to research, design, development, production, and operational phases of the life cycle of systems, facilities, and equipment.

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Surfing the Net

Federal Civilian Agencies

Acquisition Reform Network (ARNET)

<http://www.arnet.gov/>
Virtual library; federal acquisition and procurement opportunities; best practices; electronic forums; business opportunities; acquisition training; Excluded Parties List.

Committee for Purchase from People Who are Blind or Severely Disabled

<http://www.jwod.gov>
Provides information and guidance to federal customers on the requirements of the Javits-Wagner-O'Day (JWOD) Act.

Federal Acquisition Institute (FAI)

<http://www.faionline.com>
Virtual campus for learning opportunities as well as information access and performance support.

Federal Acquisition Jump Station

<http://nais.nasa.gov/fedproc/home.html>
Procurement and acquisition servers by contracting activity; CBDNet; Reference Library.

Federal Aviation Administration (FAA)

<http://www.asu.faa.gov>
Online policy and guidance for all aspects of the acquisition process.

General Accounting Office (GAO)

<http://www.gao.gov>
Access to GAO reports, policy and guidance, and FAQs.

General Services Administration (GSA)

<http://www.gsa.gov>
Online shopping for commercial items to support government interests.

Library of Congress

<http://www.loc.gov>
Research services; Congress at Work; Copyright Office; FAQs.

National Technical Information Service (NTIS)

<http://chaos.fedworld.gov/onow/>
Online service for purchasing technical reports, computer products, videotapes, audiocassettes, and more!

Small Business Administration (SBA)

<http://www.SBAonline.SBA.gov>
Communications network for small businesses.

U.S. Coast Guard

<http://www.uscg.mil>
News and current events; services; points of contact; FAQs.

Committee for Purchase From People Who are Blind or Severely Disabled

<http://www.jwod.gov>
Provides information and guidance to federal customers on the requirements of the Javits-Wagner-O'Day (JWOD) Act.

U.S. Department of Transportation MAR-ITIME Administration

http://www.marad.dot.gov/offices/cargo_perf.html

Topical Listings

Provides information and guidance on the requirements for shipping cargo on U.S.-flag vessels.

MANPRINT (Manpower and Personnel Integration)

<http://www.MANPRINT.army.mil>
Points of contact for program managers; relevant regulations; policy letters from the Army Acquisition Executive; as well as briefings on the MANPRINT program.

DoD Specifications and Standards Home Page

<http://www.dsp.dla.mil>
All about DoD standardization; key Points of Contact; FAQs; Military Specifications and Standards Reform; newsletters; training; nongovernment standards; links to related sites.

Joint Advanced Distributed Simulation (JADS) Joint Test Force

<http://www.jads.abq.com>
JADS is a one-stop shop for complete information on distributed simulation and its applicability to test and evaluation and acquisition.

Program Management Community of Practice (PMCoP)

<http://www.pmcop.dau.mil>
Includes risk management, contracting, system engineering, total ownership cost (TOC) policies, procedures, tools, references, publications, Web links, and lessons learned.

Earned Value Management

<http://www.acq.osd.mil/pm>
Implementation of Earned Value Management; latest policy changes; standards; international developments; active notebook.

Fedworld Information

<http://www.fedworld.gov>
Comprehensive central access point for searching, locating, ordering, and acquiring government and business information.

GSA Federal Supply Service

<http://pub.fss.gsa.gov>
The No. 1 resource for the latest services and products industry has to offer.

Commerce Business Daily

<http://www.govcon.com/>
Access to current and back issues with search capabilities; business opportunities; interactive yellow pages.

If you would like to add your acquisition or acquisition and logistics excellence-related Web site to this list, please put your request in writing and fax it to Sylvia Gasiorek-Nelson, (703) 805-2917.

Industry and Professional Organizations

DAU Alumni Association

<http://www.dauaa.org>
Acquisition tools and resources; government and related links; career opportunities; member forums.

Electronic Industries Alliance (EIA)

<http://www.eia.org>
Government Relations Department; includes links to issue councils; market research assistance.

National Contract Management Association (NCMA)

<http://www.ncmahq.org>
"What's New in Contracting?"; educational products catalog; career center.

National Defense Industrial Association (NDIA)

<http://www.ndia.org>
Association news; events; government policy; *National Defense* magazine.

International Society of Logistics

<http://www.sole.org/>
Online desk references that link to logistics problem-solving advice; Certified Professional Logistician certification.

Computer Assisted Technology Transfer (CATT) Program

<http://catt.bus.okstate.edu>
Collaborative effort between government, industry, and academia. Learn about CATT and how to participate.

Software Program Managers Network

<http://www.spmn.com>
Site supports project managers, software practitioners, and government contractors. Contains publications on highly effective software development best practices.

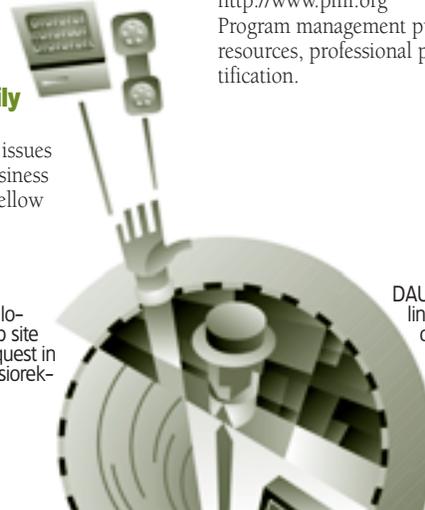
Association of Old Crows (AOC)

<http://www.crows.org>
Association news; conventions, conferences and courses; *Journal of Electronic Defense* magazine.

Project Management Institute

<http://www.pmi.org>
Program management publications, information resources, professional practices, and career certification.

DAU encourages the reciprocal linking of its Home Page to other interested agencies. Contact the DAU Webmaster at: webmaster@dau.mil.



Program Manager Writer's Guidelines in Brief (<http://www.dau.mil/pubs/pm/articles.asp>)

Purpose

The purpose of *Program Manager* Magazine is to instruct members of the DoD Acquisition, Technology & Logistics (AT&L) Workforce and Defense Industry on policies, trends, legislation, senior leadership changes, events, and current thinking affecting program management and defense systems acquisition, and to disseminate other information pertinent to the professional development and education of the DoD Acquisition Workforce.

Subject Matter

Subjects may include, but are not restricted to, all aspects of program management; professional and educational development of DoD's AT&L Workforce; acquisition and logistics excellence; Defense industrial base; research and development; test and evaluation; modeling and simulation; commercial best business practices; and interviews with Government-Industry Defense executives.

Program Manager is not a forum for academic papers, fact sheets, technical papers, or white papers (these are typically recognized by their structured packaging, e.g., Introduction, Background, Discussion, Methodology, Recommendations, Conclusions). Those papers are more suited for DAU's journal, *Acquisition Review Quarterly*. *Program Manager* Magazine publishes, for the most part, feature stories that include real people and events. Stories that appeal to our readers—who are senior military personnel, civilians, and defense industry professionals in the program management/acquisition business—are those taken from real-world experiences vs. pages of researched information.

Good writing sounds like comfortable conversation. Write naturally and avoid stiltedness. Except for a rare change of pace, most sentences should be 25 words or less, and paragraphs should be six sentences. Vary your syntax. Avoid falling into the trap of writing one declarative sentence after another. Package your article with liberal use of subheads.

Length of Articles

Program Manager is flexible regarding length, but articles most likely to be published are generally 2,000–3,000 words or about 10 double-spaced pages, each page having a 1-inch border on all sides. However, do not be constrained by length requirements; tell your story in the most direct way, regardless of length. Do not submit articles in a layout format, nor should articles include any footnotes, endnotes, or references. *Be sure to define all acronyms.*

Photos and Illustrations

Articles may include figures, charts, and photographs. They must, however, be in a separate file from the article. Photos must be black and white or color. *Program Manager* does not guarantee the return of photographs. Include brief, numbered captions keyed to the photographs. Place a cor-

responding number on the lower left corner, reverse side of the photographs. Also, be sure to include the *source* of the photograph. *Program Manager* publishes no photos from outside the Department of Defense without express permission. Photocopies of photographs are not acceptable.

With the increase in digital media capabilities, authors can now provide digital files of photos/illustrations. (Our author guidelines at <http://www.dau.mil/pubs/pm/articles.asp> contain complete instructions on transferring these files.) Note that they must meet the following publication standards set for *Program Manager*: color and greyscale (if possible); EPS files generated from Illustrator (preferred) or Corel Draw (if in another format, provide program format as well as EPS file); TIFF files with a resolution of 300 pixels per inch; or other files in original program format (i.e., Powerpoint).

Biographical Sketch

Include a short biographical sketch of the author(s)—about 25 words—including current position and educational background.

Clearance

All articles written by authors employed by or on contract with the U.S. Government must be cleared by the author's public affairs or security office prior to submission. In addition, each author must certify that the article is a "Work of the U.S. Government." This form is found at the end of the PM Author Guidance. Click on "Copyright Forms" and print the last page only, sign, and submit with the article. Since all articles appearing in *Program Manager* are in the public domain and posted to the DAU Web site, no copyrighted articles will be accepted. This is in keeping with DAU's policy of widest dissemination of its published products.

Submission Dates

Issue	Author's Deadline
January–February	1 December
March–April	1 February
May–June	1 April
July–August	1 June
September–October	1 August
November–December	1 October

Submission Procedures

Articles (in MS Word) may be submitted via e-mail to *collie.Johnson@dau.mil* or via U.S. mail to: DAU PRESS, ATTN C. JOHNSON, 9820 BELVOIR RD, SUITE 3, FORT BELVOIR VA 22060-5565. For photos/illustrations accompanying your article, send us the original photos or follow the guidance under "Photos and Illustrations"—opposite column. All submissions must include the author's name, mailing address, office phone number (DSN and commercial), and fax number.

PM

A Bimonthly Magazine
of the Defense
Acquisition University