

# P M

## PROGRAM MANAGER



DAU BUILDING COMMUNITIES OF PRACTICE

### Corporate University Best In Class (CUBIC) Awards

DAU Named a Winner in Four Categories



DAU President Frank J. Anderson Jr. (right) accepts a CUBIC Award for the University's selection as the 2002 Best Overall Corporate University. Presenting the award is Harry H. "Hap" Brakeley III, Managing Partner, Accenture Learning.



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COMMONALITY**

**TECHNICAL PERFORMANCE  
MEASUREMENT**

**ACTIVITY BASED COSTING**

*Deputy Secretary of Defense Paul Wolfowitz Cancels DoD  
5000-Series Documents—Issues Interim Guidance*

# PROGRAM MANAGER

Vol XXXI, No. 6, DAU 171

Some photos appearing in this publication may be digitally enhanced.



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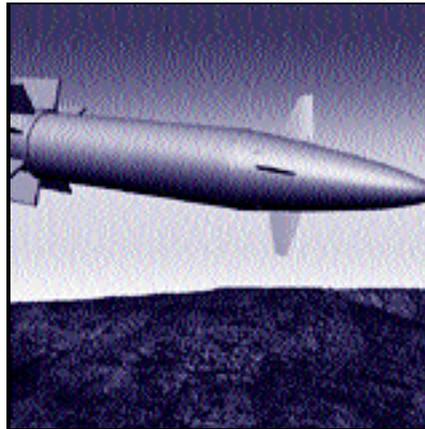
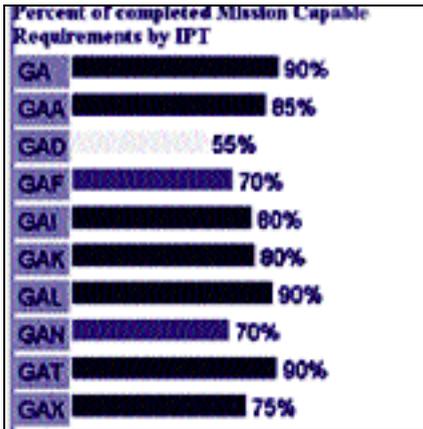
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# Releasing the Power of Innovation in Acquisition Management

## DoD 5000 Series Acquisition Policy Documents Cancelled, DEPSECDEF Issues Interim Guidance

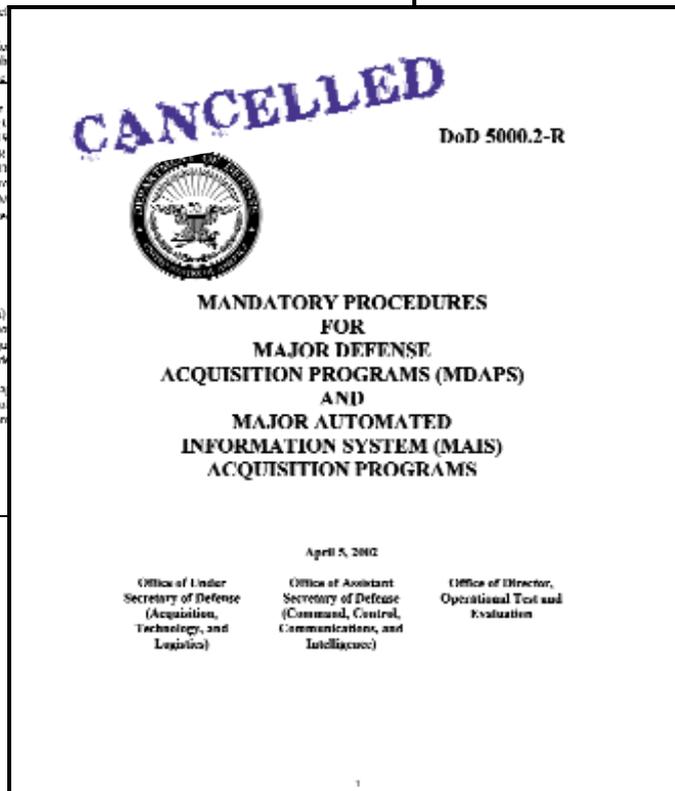
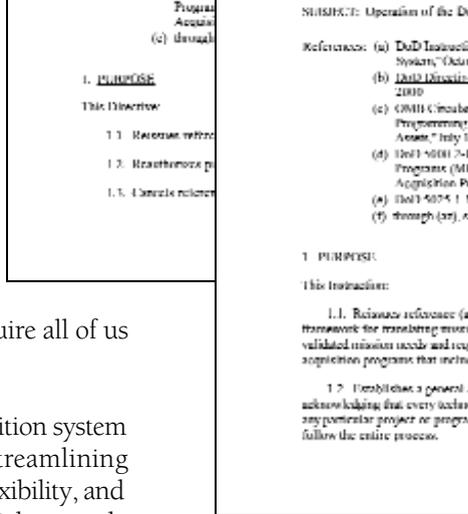
BARBARA ROSTOSKY BRYGIDER

**T**ransformation is the word that can be heard throughout the Department from Secretary of Defense Donald Rumsfeld down to the soldiers in the field. As the Department transforms its military to be more responsive to today's world, so too must the acquisition process that provides the ships, tanks, planes, and other systems to the warfighter.

### Changing the Acquisition System

With this renewed sense of awareness of the challenges and opportunities of our new security environment, the Department has undertaken a significant initiative to enable the "power of innovation in acquisition management" that will require all of us to think differently.

We are changing the acquisition system to improve the process, streamlining policies to give you more flexibility, and changing the nature of oversight to push decisions and responsibilities to the lowest levels. This initiative is part of an overall strategy to attract and retain a talented acquisition, technology and logistics workforce that will capitalize on more flexible policies to rapidly deliver affordable, sustainable capability to the warfighter. This strategy includes an ac-



*Brygider* is a policy analyst in the Office of the Director, Defense Procurement and Acquisition Policy, OUSD(AT&L), The Pentagon, Washington, D.C.

quisition system that facilitates flexibility, policies that permit innovative practices, finding and training innovative managers, and finally, giving those managers the “freedom to manage.”

### **Cancellation of DoD 5000 Series Acquisition Policy Documents**

The first step in changing the acquisition system began when Deputy Secretary of Defense Paul Wolfowitz issued a crucial policy memorandum on Oct. 30, 2002, that cancelled the series of DoD 5000 acquisition policy documents and issued interim guidance to take the place of those documents. The current policy is considered overly prescriptive and not conducive to an acquisition environment that fosters flexibility, efficiency, creativity, and innovation.

Cancelled by the Wolfowitz’ memorandum are: 1) the current DoD Directive 5000.1, *The Defense Acquisition System*, 2) the DoD Instruction 5000.2, *Operation of the Defense Acquisition System*, and 3) the DoD 5000.2 Regulation, *Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs*. While the interim guidance is in place, the Department has until Jan. 15, 2003, to develop and coordinate the final streamlined policy.

The DoD Directive 5000.1 and the DoD Instruction 5000.2 policy revisions retain basic principles, statutory requirements, and focus on outcomes and best business practices, not processes. Independent testing and resource reviews are still required. The cancelled DoD 5000.2 Regulation becomes a guide with lessons learned and information on how to develop documents such as the Test and Evaluation Master Plan (TEMP); and provides guidance, not requirements, on practices and procedures in the acquisition system.

### **Other Key Policy Initiatives**

The streamlined DoD 5000 removes prescriptive procedures while highlighting other key policy initiatives. Examples of policy initiatives crucial to permitting further innovative practices are Performance Based Acquisition,

**The first step in changing the acquisition system began when Deputy Secretary of Defense Paul Wolfowitz issued a crucial policy memorandum on Oct. 30, 2002, that cancelled the series of DoD 5000 acquisition policy documents and issued interim guidance to take the place of those documents.**

where requirements are articulated using required results rather than prescribed methods; the Future Logistics Enterprise, where the logistics footprint is reduced by operating an end-to-end logistics business as a single enterprise; and developing Integrated Requirements and Acquisition processes based on capabilities, integrated architectures, and collaboration between users and acquirers throughout the entire process.

The 5000 policy streamlining and other policy changes are just one facet of releasing the power of innovation in program management. There have been several changes implemented since the

advent of the new administration that have pushed decision making to the lowest levels. These changes include a Defense Acquisition Board that includes the Service Secretaries, Evolutionary Acquisition and Spiral Development as the preferred strategy, realistic pricing of programs, and an emphasis on total ownership costs. All these policies contribute to giving the program manager more room to innovate and freely manage his or her program.

### **The Human Element**

Having the freedom to manage is useless unless we have the right managers. The most important element in the acquisition system is the human element—the program manager. Indeed, program managers are the key to innovation, and the Department has undertaken a significant human capital strategic planning effort to attract, develop, and reward personnel.

When hiring new personnel, marketing strategies are aimed at required skill sets for recruiting potential program managers. To fully develop new personnel as well as the program managers already in the Department, cross-functional assignments, career mobility, and of course, training, are receiving more focus. Training innovative program managers will be done through the new Program Management Training (PMT) series courses at the Defense Acquisition University using Harvard case-based learning. Continuous learning courses also play an important role in training program managers after certification—with 32 courses now available on the Web, 24 hours a day, at any location—and help program managers stay current with the latest policy changes.

### **The Keys to Innovation**

The keys to innovation—having a flexible acquisition system, having the right policies, and having the right people with the freedom to manage—will result in providing better performing systems to the warfighter in less time, and at less cost. We are entering a period of transformation and this transformation can and will release the “power of innovation” in you.

# Wolfowitz Cancels DoD 5000 Series Documents



THE DEPUTY SECRETARY OF DEFENSE  
WASHINGTON, D.C. 20301-1000



OCT 30 2002

MEMORANDUM FOR DIRECTOR, WASHINGTON HEADQUARTERS  
SERVICES

SUBJECT: Cancellation of DoD 5000 Defense Acquisition Policy Documents



I have determined that the current subject documents require revision to create an acquisition policy environment that fosters efficiency, flexibility, creativity, and innovation. Therefore, I am cancelling these documents effective immediately; issuing interim guidance by separate memorandum; and directing the Under Secretary of Defense for Acquisition, Technology, and Logistics to jointly prepare revised documents, with the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) and the Director, Operational Test and Evaluation, within 120 days.

Please issue an SD-106-2, *DoD Publication System Change Transmittal* cancelling each of the following documents, and include the associated statement on each form:

- DoD Directive 5000.1, *The Defense Acquisition System*, October 23, 2000. "The detailed policies included in this Directive require revision to create an acquisition policy environment that fosters efficiency, flexibility, creativity, and innovation. A replacement document will be issued within 120 days."
- DoD Instruction 5000.2, *Operation of the Defense Acquisition System*, April 5, 2002. "The detailed procedures included in this Instruction require revision to create an acquisition policy environment that fosters efficiency, flexibility, creativity, and innovation. A replacement document will be issued within 120 days."
- DoD 5000.2-R, *Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs*, April 5, 2002. "The detailed procedures included in this Regulation require revision to create an acquisition policy environment that fosters efficiency, flexibility, creativity, and innovation. This document is cancelled and will not be reissued."

**Editor's Note:** This information is in the public domain at <http://www.acq.osd.mil/ar/#5000>.



THE DEPUTY SECRETARY OF DEFENSE  
WASHINGTON, D.C. 20301-1000



OCT 30 2002

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS  
CHAIRMAN OF THE JOINT CHIEFS OF STAFF  
UNDER SECRETARIES OF DEFENSE  
DIRECTOR DEFENSE RESEARCH AND ENGINEERING  
ASSISTANT SECRETARIES OF DEFENSE  
GENERAL COUNSEL, DEPARTMENT OF DEFENSE  
INSPECTOR GENERAL, DEPARTMENT OF DEFENSE  
DIRECTOR, OPERATIONAL TEST AND EVALUATION  
ASSISTANTS TO THE SECRETARY OF DEFENSE  
DIRECTOR, ADMINISTRATION AND MANAGEMENT  
DIRECTOR, NET ASSESSMENT  
DIRECTORS OF THE DEFENSE AGENCIES  
DIRECTORS OF DOD FIELD ACTIVITIES

SUBJECT: Defense Acquisition

I have determined that the current DoD Directive 5000.1, *The Defense Acquisition System*, DoD Instruction 5000.2, *The Operation of the Defense Acquisition System*, and DoD 5000.2-R, *Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs*, require revision to create an acquisition policy environment that fosters efficiency, flexibility, creativity, and innovation. Therefore, by separate memorandum, I have cancelled those documents effective immediately.

By this memorandum, I am issuing the attached interim guidance in place of the cancelled documents. The intent of the guidance is to rapidly deliver affordable, sustainable capability to the warfighter that meets the warfighter's needs. Additional supporting discretionary best practices, lessons learned, and expectations have been posted to the DoD 5000 Resource Center at <http://dod5000.dau.mil>.

I am directing the Under Secretary of Defense for Acquisition, Technology, and Logistics, with the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) and the Director, Operational Test and Evaluation, to jointly prepare revised documents within 120 days.

Attachments:  
As stated

**Editor's Note:** This information is in the public domain. To download the attachments to Wolfowitz' memorandum, go to <http://www.acq.osd.mil/ar/#5000>.

# DAU Sets Industry Standards as Best in Class Corporate University

PAUL T. MCMAHON

**F**ORT BELVOIR, Va. (Nov. 19, 2002)—The Defense Acquisition University (DAU), a corporate university dedicated to the training and education of the Department of Defense Acquisition, Technology, and Logistics (DoD AT&L) workforce, walked away a winner in four different categories (three organizational awards and one individual award) at the 2002 Corporate University Best In Class (CUBIC) Awards.

- Best Overall Corporate University
- Best Virtual Corporate University/Best Use of Technology
- Most Innovative Corporate University (second place)
- Corporate University Leader of the Year

This year's awards were presented Nov. 19, in Orlando, Fla., as part of Corporate University Week 2002—the industry's largest conference and exhibition devoted entirely to corporate universities.

Criteria for the awards included alignment to organizational business strategy, blended learning adaptation, and enculturation of learning throughout the organization. The judges also considered integration of educational partners into the corporate university.



Defense Acquisition University (DAU) President Frank J. Anderson Jr. (right) accepts a Corporate University Best in Class (CUBIC) Award on behalf of DAU for the University's selection as 2002 Best Overall Corporate University. Presenting the award is Harry H. "Hap" Brakeley III, Managing Partner, Accenture Learning. The CUBIC Awards honor and recognize corporate universities that apply true best practices. Anderson received the award, along with three others—Best Virtual Corporate University/Best Use of Technology, Most Innovative Corporate University (second place), and Robert D. Roland Corporate University Leader of the Year—on Nov. 19, 2002, in Orlando, Fla., as part of "Corporate University Week 2002."

The CUBIC Awards honor and recognize corporate universities that apply true best practices. A prestigious panel of leading corporate university experts gathered to objectively evaluate the true



**McMahon** is Customer Relationships Manager (CRM) for the Defense Acquisition University at Fort Belvoir, Va.

effectiveness of world-class corporate universities. Over 50 corporate universities were competing for this year's awards.

Under the guidance of Under Secretary of Defense for Acquisition, Technology and Logistics, Edward C. "Pete" Aldridge, and his Principal Deputy, Michael Wynne, DAU transformed from a traditional university to a corporate university in 2001-2002, emphasizing Web-based training, performance con-

sulting in the workplace, and forming strategic partnerships with universities, industry, and professional organizations.

DAU President Frank J. Anderson Jr., was selected as the Robert D. Rolland Corporate University Leader of the Year in recognition of his strategic role in determining how learning is driven and integrated throughout DAU and the workplace. The judges also considered his vision of the corporate university's future, the high level of commitment

demonstrated by DAU employees, and how well the operational team and staff organization is aligned with mission.

DAU, headquartered 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 to approximately 129,000 practitioners in the DoD AT&L workforce.



Anderson (right) accepts Best Virtual Corporate University/Best Use of Technology award on behalf of DAU, from Norm Kamikow, President, *Chief Learning Officer* magazine.

Anderson (right) accepts the Robert D. Rolland Corporate University Leader of the Year award from Karen Barley, Vice President, Corporate University Enterprise.



Anderson (right) accepts a second place (runner-up) award for Most Innovative Corporate University on behalf of DAU, from Ed Cohen, Director, Center for Performance Excellence, Booz, Allen & Hamilton.

# DAU Launches New Online Modules

## Continuous Learning Opportunities for the DoD AT&L Workforce

SYLWIA GASIOREK-NELSON

The Defense Acquisition University (DAU) Continuous Learning Center (CLC) has recently launched two new Continuous Learning Online Modules: *DoD Government Purchase Card Tutorial* and *Introduction to Lean Enterprise Concepts*. Both modules represent the CLC's latest efforts to provide continuous learning opportunities to the DoD AT&L workforce. The CLC's basic mission is to provide a single portal for easy access to a multitude of continuous learning opportunities, performance support, and information.

### DoD Government Purchase Card Tutorial

DoD designed this module for the entire workforce, including DoD AT&L workforce members, program managers, acquisition logisticians, sustainment logisticians, contracting personnel, financial managers, and Defense contractors.

The DoD Government Purchase Card (GPC) Tutorial was developed to train government purchase cardholders, approving officials, and certifying official nominees. According to a Sept. 27, 2002, memorandum signed by Deidre Lee, Director, Defense Procurement and Acquisition Policy, this training is mandatory.

*Gasiorek-Nelson is a full-time contract editor for Program Manager Magazine, Defense Acquisition University Press, Fort Belvoir, Va.*



The DoD GPC Tutorial contains 10 lessons that present mandatory requirements and other guidelines to consider and apply when using the GPC.

- Lesson 1: Introduction to the DoD GPC Tutorial
  - Lesson 2: GPS Responsibilities
  - Lesson 3: Unauthorized Use of the GPC
  - Lesson 4: GPC Controls and Procedures
  - Lesson 5: GPC Billing Cycle
  - Lesson 6: GPC Disputes
  - Lesson 7: GPC Efficiencies
  - Lesson 8: Documenting GPC Purchases
  - Lesson 9: GPC Ethics
  - Lesson 10: DoD GPC Tutorial Summary
- Recognize the various rules of increasing Cardholder monthly or office purchase limits.
  - Define the requirements when changing Approving Officials.
  - Recognize circumstances of account termination.
  - Identify the key roles and responsibilities of various players involved with GPC.
  - Recognize the various rules involved with account suspension.
  - Recognize the rights and responsibilities of Certifying Officials across agencies.

By completing this course, learners will be able to recognize, identify, or define the following requisite knowledge and actions required to serve as government purchase cardholders, approving officials, or certifying officials.

- Recognize restrictions on GPC use.
- Define split purchases.
- Identify types of Cardholder and Non-Cardholder fraud.
- Recognize how to report GPC fraud.
- Recognize the importance of separating GPC roles and responsibilities.
- Identify GPC purchase flow.
- Recognize guidelines to consider when making micro-purchases.
- Define limits to making purchases with the GPC.
- Recognize the walk-through procedures in contracting of emergency purchases.
- Recognize the suppliers and recognize the priority for each source.
- Recognize procedures for the closing of the billing cycle.
- Identify the structure behind the GPC account numbers, and define certification information.
- Define disputes and identify possible dispute causes and procedures to follow when using the GPC.
- Recognize forms used for disputing charges to the GPC.
- Identify procedures to follow during form completion.
- Recognize appropriate feedback from disputes.
- Recognize the Cardholder's responsibilities in dispute procedures.
- Define sustainment items.
- Identify accommodation/convenience checks.
- Recognize procedures for accommodation/convenience checks.
- Define procedures for ordering against indefinite delivery/indefinite quantity contracts, federal supply schedule contracts, basic ordering agreements, and blanket purchase agreements.
- Recognize benefits of making payments with the GPC for printing services.
- Identify differences between using the GPC and the DD Form 1556 for payments in training.
- Recognize the Cardholder's responsibility to maintain purchase documentation and its importance.
- Identify ethical standards of conduct and their regulatory/legal foundation.

Commenting on the new DAU CLC module, Bob Faulk, Director, DAU Con-

tinuous Learning, said, "Among its many benefits, the tutorial provides an alternative to off-site training and costly TDY expenses. It is accessible as an online reference tool and provides a source for the mandatory two-year refresher training."

He also emphasized that more than 1,000 students successfully completed the four-hour module, within the first 60 days of going "live" on the CLC site. "The GPC tutorial is the hottest module currently on the CLC site. We have added 3,500 new registered users since the Aug. 28, 2002, release of the DoD GPC Tutorial," Faulk said.

The average cumulative time for module completion is four hours, and four Continuous Learning Points (CLPs) are earned upon completion. Students can take this self-paced module over time,

returning to the last accessed page when convenient. The module includes periodic review questions and a post-test. The post-test requires a minimum score of 70 percent and may be retaken as many times as necessary. A certificate of completion is awarded at the successful completion of the post-test. Upon earning the certificate, it may be accessed electronically anytime from the student's personal transcript file within the CLC.

## **Introduction to Lean Enterprise Concepts**

As a result of a strategic partnership signed on May 22, 2002, between DAU and the MIT-sponsored Lean Aerospace Initiative, MIT and DAU jointly developed the Introduction to Lean Enterprise Concepts module to improve the professional knowledge of the DoD AT&L workforce, MIT students, representatives of the Defense industry, and



<ul style="list-style-type: none"> <li>• Commercial Off-the-Shelf (COTS) Acquisition for Program Managers</li> <li>• Commercial Item Determination</li> <li>• Commercial Item Determination CD-ROM Students Only</li> <li>• Commercial Item Determination: Executive Overview</li> <li>• Contracting Overview</li> <li>• Contracting Incentives</li> <li>• Cost Estimating Overview</li> <li>• DoD 5000 Tutorial</li> <li>• DoD Government Purchase Card Tutorial</li> <li>• Earned Value Management System</li> <li>• Fiscal Law Tutorial</li> <li>• Fundamentals of the Integrated Product Teams</li> <li>• General Services Administration (GSA) SmartPay Web-based Training (WBT)-Purchase Card Program</li> <li>• International Armaments Cooperation, Part 1</li> <li>• International Armaments Cooperation, Part 2</li> <li>• International Armaments Cooperation, Part 3</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction to Lean Enterprise Concepts</li> <li>• Knowledge Management: Building Your Community of Practice</li> <li>• Market Research Training Modules</li> <li>• Other Transactional Authority (OTA) for Prototype Projects: Comprehensive Coverage</li> <li>• Other Transactional Authority for Prototype Projects Overview</li> <li>• Past Performance Information</li> <li>• Past Performance Information CD-ROM Students Only</li> <li>• Performance-based Payments Executive Overview</li> <li>• Performance-based Logistics</li> <li>• Requirements Generation</li> <li>• Risk Management</li> <li>• Scheduling</li> <li>• Simplified Acquisition Procedures</li> <li>• Six Sigma: Concepts and Process</li> <li>• Understanding and Utilizing Performance-based Payments</li> <li>• Work Breakdown Structure (WBS) Overview</li> </ul>
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other organizations interested in Lean Enterprise Principles.

This self-paced module covers the following eight lessons:

- **Lesson 1:** Course Welcome to the Introduction to Lean Enterprise
- **Lesson 2:** Defining Lean
- **Lesson 3:** Welcome to the Importance of Lean
- **Lesson 4:** Developing an Enterprise Perspective
- **Lesson 5:** Lean Enterprise Principles and Practices
- **Lesson 6:** Identifying Waste in Lean Enterprise
- **Lesson 7:** Ideas for Implementing Lean
- **Lesson 8:** Summary of Introduction to Lean Enterprise Concepts.

Applying lean concepts results in improved quality, reduced cost, reduced time, more flexibility, employee empowerment, and long-term competitive success. By completing this module learners will be able to:

- Identify key lean concepts.
- Recognize milestones in the historical development of lean.
- Recognize definitions of lean.
- Recognize principles of lean.

The average cumulative time for module completion is three and a half hours, and three and a half CLPs are earned upon completion. According to Faulk, "We have been advised that this module is a part of the Army Materiel Command's move to adopt Lean; and that the DAU's Lean tutorial and Lean Web site take up one of the six pages on the Army's brochure. This should generate some significant interest in this continuous learning module."

The DAU CLC provides over 30 modules available online (see preceding page). Students may take the self-paced modules over time, returning to the last accessed page when convenient. Each module includes periodic review questions and a post-test. The post-test requires a minimum score of 70 percent and may be retaken as many times as

necessary. A certificate of completion is awarded upon successful completion of the post-test. Upon earning the certificate, it may be accessed electronically anytime from the student's personal transcript file within the CLC.

To access the modules, go to the DAU CLC Web page at <http://clc.dau.mil>. To access the modules for credit points, login using your Login ID and Password, select the "Learning Center," and then

select the "Course Information & Access" link. For information about the modules, select the computer icon next to the module title. To launch the modules, select the module name from the list of modules.

For more information on the CLC, visit the DAU CLC Web site at <http://clc.dau.mil>. For additional assistance or questions on the DAU CLC, contact Faulk at [bob.faulk@dau.mil](mailto:bob.faulk@dau.mil).

## Attention Subscribers to Program Manager & Acquisition Review Quarterly

### IMPORTANT FREEDOM OF INFORMATION ACT (FOIA) NOTICE

**Y**our *Program Manager* magazine and *Acquisition Review Quarterly* journal subscription information is subject to the Freedom of Information Act (FOIA). By law, subscription lists showing a business address are public information. Lists of subscribers who receive Defense Acquisition University publications at their home address, however, will not be released.

We offer these options for your consideration:

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9820 BELVOIR ROAD STE 3  
FORT BELVOIR VA 22060-5565**

# Aldridge Calls for David Packard Excellence in Acquisition Award Nominations



THE UNDER SECRETARY OF DEFENSE  
3010 DEFENSE PENTAGON  
WASHINGTON, D.C. 20301-3010

08 NOV 2002

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: David Packard Excellence in Acquisition Award Nominations

This memorandum serves two purposes: (1) to update and reissue the Under Secretary of Defense (Acquisition, Technology & Logistics) (USD(AT&L)) policy on "Recognition and Awards for Acquisition Personnel" (attached), originally published June 9, 1996, revised November 3, 1997, October 13, 2000, and October 2001; and (2) to solicit nominations for the annual David Packard Excellence in Acquisition Award. The Policy is updated to incorporate the organization name change of the Director, Defense Procurement and Acquisition Policy effective October 1, 2002.

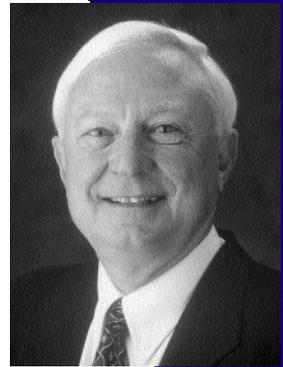
The nomination period for the annual David Packard Excellence in Acquisition Award that recognizes organizations, groups, and teams that have demonstrated exemplary innovation and best acquisition practices is now open. Each Military Department and the Defense Logistics Agency may submit nominations for up to five teams, and all other Components and OUSD(AT&L) principals may nominate two teams. Specific guidelines on the eligibility, nomination, and selection criteria are provided at TAB 3 of the policy and will be followed in the review process. Submit nominations no later than February 1, 2003, to:

Office of Under Secretary of Defense (AT&L)  
ATTN: Director for Administration  
3150 Defense Pentagon, Room 3D1020  
Washington, DC 20301-3150

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# Selected Acquisition Reports

## From September 2002

The Department of Defense has released details on major defense acquisition program cost and schedule changes since the June 2002 reporting period. This information is based on the Selected Acquisition Reports (SARs) submitted to the Congress for the Sept. 30, 2002, reporting period.

SARs summarize the latest estimates of cost, schedule, and technical status. These reports are prepared annually in conjunction with the President's budget. Subsequent quarterly exception reports are required only for those programs experiencing unit cost increases of at least 15 percent or schedule delays of at least six months. Quarterly SARs are also submitted for initial reports, final

reports, and for programs that are rebaselined at major milestone decisions.

The total program cost estimates provided in the SARs include research and development, procurement, military construction, and acquisition-related operation and maintenance (except for pre-Milestone B programs which are limited to development costs pursuant to 10 USC §2432). Total program costs reflect actual costs to date as well as future anticipated costs. All estimates include anticipated inflation allowances.

The current estimate of program acquisition costs for programs covered by SARs for the prior reporting period (June 2002) was

\$1,118,668.7 million. After subtracting the completed legacy portion of NAVSTAR Global Positioning System (GPS), the adjusted current estimate of program acquisition costs was \$1,110,336.3 million. There was a net cost increase of \$1,383.2 million or 0.1 percent during the current reporting period (September 2002). This increase was due primarily to higher Evolved Expendable Launch Vehicle (EELV) launch service costs resulting from payload weight growth and revised life cycle cost estimates for National Polar-Orbiting Operational Environmental Satellite System (NPOESS). The cost changes between June 2002 and September 2002 are summarized below:

	Current Estimate (\$ in Millions)
June 2002 (70 programs) . . . . .	\$1,118,668.7
Less completed Legacy portion of NAVSTAR GPS . . . . .	-8,332.4
June 2002 Adjusted (70 programs) . . . . .	\$1,110,336.3
Changes Since Last Report:	
Economic . . . . .	\$ 0.0
Quantity . . . . .	0.0
Schedule . . . . .	+80.3
Engineering . . . . .	+7.5
Estimating . . . . .	+1,291.0
Other . . . . .	0.0
Support . . . . .	+4.4
Net Cost Change . . . . .	\$ +1,383.2
Plus initial acquisition-related operation and maintenance . . . . .	+463.6
cost estimates for NPOESS (National Polar-Orbiting Operational Environmental Satellite System); previous reports limited to development cost per 10 USC §2432	
September 2002 (70 programs) . . . . .	\$ 1,112,183.1

For the September 2002 reporting period, there were quarterly exception SARs submitted for seven programs. The Navy's Future Aircraft Carrier (CVNX) program is reporting a schedule delay of six months or more. The Air Force's Evolved Expendable Launch Vehicle (EELV), NAVSTAR GPS, and Joint Air-to-Surface Standoff Missile (JASSM) programs are also reporting schedule delays of six months or more. Initial reports are being submitted for the Army's Joint Tactical Radio System (JTRS) Cluster 1 and JTRS Waveform programs following approval of System Development and Demonstration (Milestone B) in June 2002. Finally, the Air Force's National Polar-Orbiting Operational Environmental Satellite System (NPOESS) program is rebaselining the SAR from a Planning Estimate to a Production Estimate to reflect approval of Acquisition and Operations (Key Decision Point C) in August 2002. Details of the changes for these seven programs are as follows:

### **Army**

**JTRS (Joint Tactical Radio System) Cluster 1**—An initial SAR was submitted for the JTRS Cluster 1 following approval of System Development and Demonstration (Milestone B) in June 2002.

**JTRS (Joint Tactical Radio System) Waveform**—An initial SAR was submitted for the JTRS Waveform following approval of System Development and Demonstration (Milestone B) in June 2002.

### **Navy**

**CVNX (Future Aircraft Carrier)**—The SAR was submitted to report a schedule slip of 12 months (from February 2002 to February 2003)

in the Early Operational Assessment (EOA), and a slip of five months (from September 2002 to February 2003) in the start of system development and demonstration (Milestone B) due to a delay in the approval of the Operational Requirements Document (ORD). Validation of the ORD is in process. There were no cost changes reported.

### **Air Force**

**EELV (Evolved Expendable Launch Vehicle)**—The SAR was submitted to report a schedule slip of 10 months (from July 2003 to May 2004) to the planned heavy launch vehicle first operational flight. The delay is due to payload scheduling issues and does not represent an issue with the launch vehicles. Program costs increased \$529.4 million (+2.9 percent) from \$18,385.1 million to \$18,914.5 million, due primarily to a launch service adjustments associated with payload weight growth. That is, several satellites that EELV will launch have experienced weight growth which will require larger launch vehicles.

**JASSM (Joint Air-to-Surface Standoff Missile)**—The SAR was submitted to report a schedule slip of nine months (from December 2003 to September 2004) to the estimated F-16 required assets available milestone. This delay was due to a slip in release of the software tape for the F-16 operational flight profile schedule. Program costs increased \$43.6 million (+1.4 percent) from \$3,119.6 million to \$3,163.2 million, due primarily to additional Navy funding required to integrate JASSM on the F/A-18 E/F.

**NAVSTAR Global Positioning System (GPS)**—The SAR was submitted to report a schedule slip of 14 months (from May 2003 to July 2004) in the first launch of the Block IIR satellite modernization. The primary causes for the delay were: (1) difficulties with signal processing discovered late in the hardware layout and testing process, and (2) scale-up of the two power supply assemblies proved more time consuming than had been anticipated. Program costs decreased \$25.4 million (-0.4 percent) from \$5,962.6 million to \$5,937.2 million, due primarily to a transfer of funding from the modernized to the legacy satellite efforts.

**NPOESS (National Polar-Orbiting Operational Environmental Satellite System)**—The SAR was submitted to rebaseline the program from a planning to a production estimate following approval of Acquisition and Operations Key Decision Point C on Aug. 22, 2002. Previously, the NPOESS SAR was limited to development costs only (per 10 USC §2432). Program costs increased \$835.6 million from \$5,366.5 million to \$6,202.1 million, due primarily to a revised life cycle cost estimate based on the shared system performance responsibility contract. Adding in the \$463.6 million of acquisition-related operation and maintenance costs (not previously reported in the development-only SAR) brings the total current estimate for NPOESS to \$6,665.7 million.

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# Technical Performance Measurement— A Program Manager's Barometer

## DCMA Pilots a Modified Approach to TPMs

MIKE FERRARO

**T**echnical Performance Measurement has been in widespread use for many years and is recognized as a highly useful method that can identify deficiencies in meeting system requirements, provide early warning of program problems, and be used to monitor technical risks. However, its utility is dependent on proper Technical Performance Measure (TPM) structure and integration with other program management tools, such as the Earned Value Management System (EVMS).

In recent years research has focused on monitoring and obtaining TPM variances, similar to those generated for cost and schedule through the EVMS and providing direct linkage to EVMS control account reporting. This can enhance overall program management, but only if TPMs are established early and formatted properly. You also need a well defined program Work Breakdown Structure (WBS) that is directly associated with the Key Performance Parameters (KPPs) of the system being designed, with clear links to the associated EVMS control accounts.

### The Make-Up of Technical Performance Measures

So what makes up a TPM? Foremost, it needs to measure something of importance to the program—a KPP that is essential to proper system operation in order to meet a mission requirement. Some programs may track a few of these



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TPMs or maybe a few dozen. Contractors may have many more TPMs in order to track derived requirements and to ensure proper technical progress toward major system requirements. A typical KPP may be system or subsystem weight. A weight TPM may have an objective (defined as the goal or required value at the end of the technical effort) or both an objective and a threshold (defined as the limiting acceptable value

**Problems are risks that have achieved a 100 percent probability. If possible, you want to manage risks and future issues, not manage problems and future impacts.**

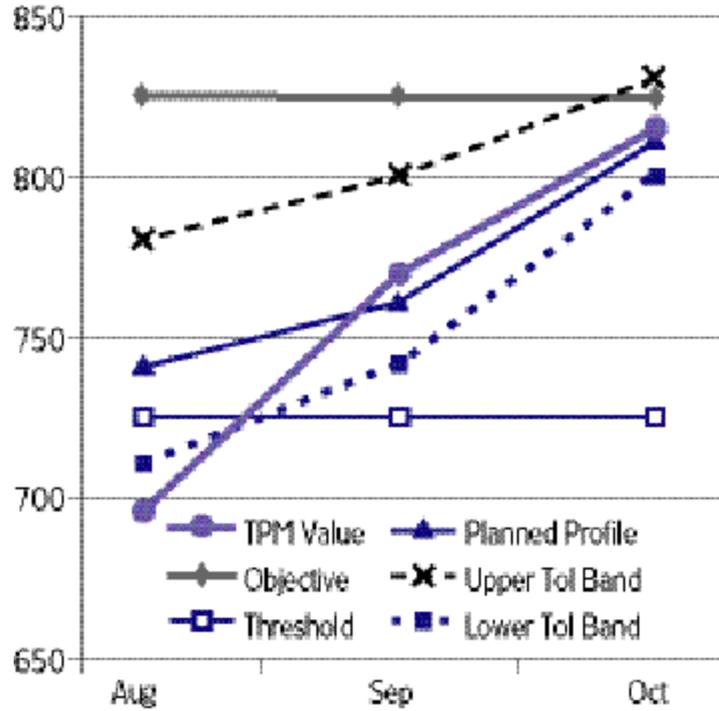


FIGURE 1. **Sample Technical Performance Measures (TPM) Chart**

that if not met can jeopardize the project). A TPM can also have tolerance bands that show the allowed variation, which is based on the projected estimation error.

Figure 1 shows a sample TPM chart. These can be simple or complex and come with various formats and methods of depiction. But most importantly, every TPM needs a planned profile, defined as: the projected time-phased achievement for the KPP from the beginning of the development (or re-planning effort) to the time the goal must be met. Without a planned profile there can be no meaningful technical variance calculated, and the risk in meeting the KPP will be underestimated because the time horizon is too long when only an objective or threshold value is used.

### EVMS, Risk, and TPMs

The EVMS and the cost and schedule variances, as well as other measurement data they generate, are proven and useful tools for program management. Variance thresholds—generally a percent of Budgeted Cost of Work Scheduled or Budgeted Cost of Work Performed—are set to ensure significant problems are brought to management's attention.

However, problems are risks that have achieved a 100 percent probability. Waiting until a problem shows up in the EVMS, no matter how quickly or often the data are generated, may be too late to form a preventive, strategic, long-term solution. If possible, you want to manage risks and future issues, not manage problems and future impacts.

In a 1995 paper titled "Technical Performance Measurement, Earned Value, and Risk Management: An Integrated Diagnostic Tool for Program Management," retired Navy Cmdr. Nick Pisano wrote:

*"Currently reported earned value data contain invaluable planning and budget information with proven techniques for program management; however, shortcomings of the system are its emphasis on retrospection and lack of integration with technical achievement."*

Use of TPMs can help with the problem of retrospection since TPMs are indicators of current progress in meeting technical requirements. This also makes them much more effective as a risk management tool. Synergy and optimal use of TPMs comes from integration with

WBS to TPM Correlation DATE: 06/10/01

WBS	TPMs	TPM Coverage*	BCWP Affected by TPMs	TPM T.S.	New BCWP "TPM Informed"
2.1 Airframe Structure	Airframe Weight	0.50	125.0	0.97	121.25
	Aircraft Weight	0.05	12.5	0.97	12.13
	Weapons Weight	0.20	50.0	1.00	50.00
	Cooling System Wt	0.03	7.5	0.78	5.85
	Displays/Wiring Wt	0.02	5.0	0.80	4.00
	Navigation Sys Wt	0.05	12.5	0.99	12.38
	Radar Weight	0.08	20.0	0.93	18.60
	TOTAL	<b>0.93</b>	232.5		224.20
	Other (not affected by TPMs)	0.07	17.5	1.00	17.50
	NEW TOTAL	1.00	250.0		241.70

Quantification of WBS element Composite Technical Score **0.97**

**FIGURE 2. Initial Recalculation of Cost and Schedule Variances**

the EVMS, preferably a quantitative integration. But first, TPMs must be established and used to develop the allocation of resources to the EVMS control accounts.

**TPMs and the Integrated Baseline Review (IBR)**

The draft March 2001 "Guide to the Integrated Baseline Review," published by the National Defense Industrial Association, talks about the need for the IBR to capture "the entire scope of technical work." To achieve the Statement of Work (SOW) and Statement of Objectives (SOO) requirements, the team doing the IBR must have familiarity with both documents, and the technical plan in place. This leads to an assessment of technical risk and eventually to allocation of the resources necessary to meet the technical requirements within the confines of the agreed-to schedule.

The end result is a Performance Measurement Baseline, which provides the Budgeted Cost of Work Scheduled and is the measure against which schedule and cost variances are calculated through the EVMS. However, capturing the scope of what needs to be done is not the same as capturing the time-phased performance that needs to be accomplished for requirements to be met.

According to the IBR Guide, before the IBR is performed you must identify technical risk—the ability of the project plan to meet requirements. In addition, to

control risks you will need to maintain accurate performance data, integrated with cost and schedule. One way to do this is to establish time-phased TPMs prior to the IBR, use them as the basis for resource allocations, and track TPM variances from the planned profile as early indicators of cost and schedule, as well as technical progress and potential problems.

I know this is difficult. After all, how can one be expected to understand so early what the KPP progress should be at certain stages or milestones? What if our estimates are well off the mark and show that progress is not sufficient as measured by our plan? Our plan is just a best guess on eventual design performance, which is sometimes associated with highly technical issues that have never before been addressed. But, I would rather allocate resources against a preliminary technical performance

plan, which contains the best expert estimates I can get, than against a work completion plan.

The technical performance plan can be modified as more information becomes available. These modifications can lead to early resource reallocations, if necessary. TPM tolerance bands can accommodate the uncertainty of early estimates. Techniques can be devised to increase estimate accuracy. If a forward-looking planned profile can't be determined, you can work backward from "must have" performance milestones.

The point is that once this has been accomplished, the link has been established between scheduled technical performance, scheduled work accomplishment, cost, and personnel allocations. Now technical performance, and cost and schedule variances can be integrated and used in a complementary fashion for comprehensive program management.

**What Will This Look Like?**

Pisano and his team developed an approach to integrate technical performance by noting the technical variance, or percent deviation from expectation, and correlating it to a confidence level equivalent to the probability of achieving the TPM value by the next milestone. That confidence level (factor) was then applied to the earned value for the WBS element associated with the KPP for which the TPM was an indicator. His approach led to the development of a Technical Performance Measurement Software (TPMS) package that facilitated

SUMMARY DATE: 06/10/01

WBS	CV% Current	CV% New "TPM Informed"	SV% Current	SV% New "TPM Informed"	No. of TPMs	TPM Cov.	Comp. Tech. Score
1.1 Aircraft Weight	-1.67	-4.65	1.69	-1.21	7	1.00	0.97
2.1 Airframe Structure	-2.00	-5.50 Y	-2.72	-5.95 Y	7	0.93	0.97
3.1 Weapons Load	-2.00	-2.62	2.56	1.95	2	0.60	0.93
4.1 Cooling Capacity	-3.45	-15.20 R	-3.33	-13.19 R	2	0.50	0.90 Y
5.1 Display Functionality	-17.14 R	-18.16 R	-17.65	-18.35 R	1	0.10	0.95
6.1 Avionics Weight	-6.00 Y	-10.36 R	-4.76	-8.52 Y	2	0.95	0.95
7.1 Aircraft Endurance	-4.17	-6.13 Y	1.69	-0.19	5	0.70	0.98
8.1 Aircraft Range	-4.71	-5.93 Y	-2.30	-3.47	3	0.60	0.93
9.1 Aircraft Speed	-13.33 R	-15.06 R	-7.41 Y	-8.80 Y	3	0.60	0.93

**FIGURE 3. Initial Cost and Schedule Variances Summary**

TECHNOLOGY READINESS LEVEL	DESCRIPTION
1. Basic principles observed and reported.	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Examples might include paper studies of a technology's basic properties.
2. Technology concept and/or application formulated.	Invention begins. Once basic principles are observed, practical applications can be invented. The application is speculative and there is no proof or detailed analysis to support the assumption. Examples are still limited to paper studies.
3. Analytical and experimental critical function and/or characteristic proof of concept.	Active research and development is initiated. This includes analytical and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
4. Component and/or breadboard validation in laboratory environment.	Basic technological components are integrated to establish that the pieces will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in a laboratory.
5. Component and/or breadboard validation in relevant environment.	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so that the technology can be tested in a simulated environment. Examples include high-fidelity laboratory integration of components.
6. System/subsystem model or prototype demonstration in a relevant environment.	Representative model or prototype system, which is well beyond the breadboard tested for TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity laboratory environment or in a simulated operational environment.
7. System prototype demonstration in an operational environment.	Prototype near or at planned operational system. Represents a major step up from TRL 6, requiring the demonstration of an actual system prototype in an operational environment, such as in an aircraft, vehicle, or space. Examples include testing the prototype in a test bed aircraft.
8. Actual system completed and "flight qualified" through test and demonstration.	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.
9. Actual system "flight proven" through successful mission operations.	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. In almost all cases, this is the end of the last "bug fixing" aspects of true system development. Examples include using the system under operational mission conditions.

FIGURE 4. **Technology Readiness Levels**

linkage of TPMs to the WBS and EV control accounts.

### DCMA Begins Research of Its Own

At DCMA we started doing research in April of 2000 on this approach, and a similar one created by Kathryn Kulick, President and Principal Engineer of Technical Performance Measurement Associates, Inc., a company that uses Bayesian Networks to represent uncertainty through low-, optimal-, and high-performance estimates. In addition, we consulted with ANADAC, the company that developed TPMS for the Department of Defense and taught its use to selected Contract Management

Offices. We talked extensively with Pisano, took the Technical Performance Management course from Kulick, and attended EVMS conferences. As a result, we came to the conclusion that a simplified approach to correlate and apply TPM performance (variances) to EV control accounts was needed.

### Excel Spreadsheet Developed

To begin, we developed an Excel spreadsheet that captured the basic premise of what we had learned. We then created a training exercise and worksheet, which started from program TPMs correlated to WBS elements, and then reversed the process to show each WBS element and

all the TPMs that "covered" the work delineated in each WBS.

The coverage was estimated. What wasn't covered was put in an "other" category. We included earned value data such as Budget at Complete (BAC), Budgeted Cost of Work Performed (BCWP), Budgeted Cost of Work Scheduled (BCWS), Actual Cost of Work Performed (ACWP), and calculations for cost and schedule variances. Cost and schedule variances included both current cumulative and what would be new variances based on the effect of the TPMs. The amount of BCWP affected by the various TPMs

was calculated by multiplying the coverage factor against the current BCWP.

The new BCWP, which in Pisano's paper becomes "TPM Informed," is obtained by multiplying the amount of BCWP affected by a particular TPM, by that TPM's technical score (one minus the TPM variance). This is repeated for each TPM, with the "other" category always having a technical score of 1.00. The new BCWPs for each TPM are added together to calculate a new cumulative BCWP, which is then used in recalculating the cost and schedule variances. The result looks like Figure 2 (p. 16). (Variances in the "yellow" range are followed by a "Y"; those in the "red" range are followed by an "R"; "green" variances are not labeled.)

Note that the "New" cost and schedule variances are in the "yellow" range because there were a number of TPMs that were not on their planned profiles. These produced technical variances which, when factored against the current, slightly negative cost and schedule variances, signaled a future "yellow" condition. This means that additional resources will have to be spent to get back on track, or productivity will have to improve to get the same technical progress from the money and time remaining. This becomes an early indicator of a risk condition and allows for re-planning, re-budgeting, or re-scheduling to address the variances or, at the very least, shows that this technical effort needs to be tracked closely.

It is also a predictor, saying that the traditional earned value variances will show a "yellow" condition if the technical issues aren't addressed. Of course at that point, depending on the level of the WBS element or earned value control account, management will take action because the problem becomes evident in the traditional sense. Figure 3 on p. 16 summarizes the WBS elements used in our training.

One element of simplification in this approach was to let the technical score directly affect the earned value outcome without using an intermediary confi-

dence factor as in previous approaches. We also aligned our individual and composite technical scores with the variance thresholds traditionally used for earned value: zero to minus five percent being "green," less than minus 5 percent to minus 10 percent being "yellow," and less than minus 10 percent being "red."

We believe this is a good starting baseline but recognize that the TPM banding (when a TPM should be considered "red," "yellow," or "green") and the TPM sensitivity (its impact on earned value) can be different for each TPM. If a TPM is going to be difficult to meet, you may want a generous tolerance band in the beginning—one that narrows as time progresses. Being 10 percent off your planned profile may be a "green" condition if you are three years removed from when the requirement needs to be met, but would be a deep "red" 35 months downstream.

You can also modify a TPM's impact on the earned value control account. Instead of a 1:1 ratio, double or triple the impact if you want to raise the effect of a TPM on the earned value outcome. In effect, you have established two indicators: one a technical indicator of TPM performance and the other a management indicator of program health based on the integration of cost, schedule, and technical performance.

### **The Pilot Program**

In April 2001 we began a nine-month pilot program with seven volunteer Contract Management Offices. After an intensive two-day training period in the overall concept and spreadsheet described earlier, the engineers working the pilot returned to gather data on their selected programs and work with the contractors and program offices.

Our intent was to choose a limited number of TPMs, determine the WBS element(s) and earned value control accounts associated with them, estimate the TPM coverage, and calculate the TPM variances and new cost/schedule variances. We hoped that once this was accomplished, we could track our "TPM Informed" earned value and the new

cost and schedule variance, compare it to the traditional data, and show predictability.

By the end of the pilot, we were not able to show predictability because the chosen programs reflected inadequately structured or non-existent TPMs, an inadequate WBS structure, or unclear earned value-to-WBS relationships.

In addition, a number of programs were re-baselined, thus requiring us to do a restart, making the remaining timeframe inadequate to show any predictability. These findings form the basis of my earlier comments on TPM and program structure, requirements-to-WBS to EVMS linkages, and the necessity for a planned profile.

In rereading Pisano's paper, a finding from his first pilot project was:

**"...cost and schedule impact assessments could not always be clearly determined because there was not clear linkage between technical parameters and budgeted work packages via the WBS."**

This continues to be an issue, as does the tendency to use system and subsystem end-of-program requirements to gauge progress rather than planned profiles. But the pilot sites also had positive benefits such as a more in-depth understanding of system requirements, better insight into risk assessment, development of a systematic approach to analyzing performance, and establishment of a common basis for technical discussion.

### **Where We Are Now**

Both during and after the pilot program, we briefed this approach and our continuing research in a number of forums such as the Integrated Program Management Conference in November 2001; the National Defense Industrial Association in February 2002; and the Lean Aerospace Initiative Plenary session in March 2002.

The briefings were well received and there was a lot of general interest.

WBS to TPM Correlation

WBS	Contract MR%	TPMs	TPM Impact*	BCWP Affected by TPMs	TPM T.S.	TRL % Risk	New BCW *TPM Informed†
2.1		Airframe Weight	0.50	125.0	0.97	0.80	121.25
Airframe Structure	<b>Current</b>	Aircraft Weight	0.05	12.5	0.97	0.80	12.13
	<b>New</b>	Weapons Weight	0.20	50.0	1.00	0.15	50.00
	<b>CUM</b>	Cooling System Wt	0.03	7.5	0.78	0.70	5.85
BAC	\$300M	Displays/Wiring Wt	0.02	5.0	0.80	0.70	4.00
BCWP	250	Navigation Sys Wt	0.05	12.5	0.99	0.80	12.38
BCWS	257	Radar Weight	0.08	20.0	0.93	0.80	18.60
ACWP	255	TOTAL	<b>0.93</b>	232.5			224.20
CV%	-2.00	Other (not affected by TPMs)	0.07	17.5	1.00		17.50
SV%	-2.72	NEW TOTAL	1.00	250.0			235.33

\*Quantification of WBS element Composite Technical Score **0.90 Y**

**FIGURE 5. Recalculation of Cost and Schedule Variances Using TRL Risk Factor**

At each forum we asked for volunteer programs or contractors to help us establish a proof-of-concept pilot through a well-structured program that would address some of the previous issues. We are also working with Northrop Grumman El Segundo and their DCMA Contract Management Office, looking into the possibility of using part of the Global Hawk program.

As a result of the briefing at Northrop Grumman and subsequent research, we modified our approach and spreadsheet. We changed the column titled “TPM Coverage” to “TPM Impact” so as to convey the idea that it is both the amount of work covered in the WBS element and the effect that TPM has on the work to be accomplished.

We also added data to the spreadsheet from the General Accounting Office July 1999 report titled, “Best Practices: Better Management of Technology Development Can Improve Weapon System Outcomes.” This report looked at a number of programs in various stages, both commercial and military, and found their cost and schedule performance was related to the maturity of the technology used during product development.

The report came to the conclusion that “technology maturity can be measured and its consequences for products can be forecast.” In general, those tech-

nologies introduced at a Technology Readiness Level (TRL) of 5 or lower encountered maturation difficulties and contributed to problems in product development that, in the report’s stated examples, resulted in 60 to 120 percent increases in cost and schedule. Those products whose technologies reached a TRL of about 6 or 7 or higher were better able to meet cost, schedule, and per-

formance requirements, and in the report’s stated examples, had zero increases in cost and schedule.

In addition, the report correlated the lower TRLs with a higher risk for product launch, and conversely, technologies with high TRLs were better able to meet product objectives, or what might be considered KPPs. Figure 4 on p. 17 lists the TRLs and their definitions.

We decided to use this research in our spreadsheet by applying the general observations from the report to our TPM technical scores. We went back and estimated what the TRL would be for the technology supporting each TPM. Then, we used an arithmetic progression from .6 to 1.2 associated with TRLs of 6 to 1 (with a jump from TRL 2 to 1 of .2 in the risk factor) and labeled it TRL Risk Factor. The factor applies only to that portion of the technical score less than 1.00, so that a technical score of .97 with a TRL Risk Factor of 1.0 would mean a 6 percent reduction in the affected BCWP for an effective technical score of .94. Since there is some risk for TRLs

SUMMARY

WBS	CV% Current	CV% New*	SV% Current	SV% New*	No. of TPMs	TPM Cov.	Comp. Tech. Score
1.1 Aircraft Weight	-1.67	-7.04 Y	1.69	-3.41	7	1.00	0.95
2.1 Airframe Structure	-2.00	-8.36 Y	-2.72	-8.43 Y	7	0.93	0.94 Y
3.1 Weapons Load	-2.00	-3.11	2.56	1.46	2	0.60	0.99
4.1 Cooling Capacity	-3.45	-25.15 R	-3.33	-20.10 R	2	0.50	0.83 R
5.1 Display Functionality	-17.14 R	-21.27 R	-17.65 R	-20.45 R	1	0.10	0.97
6.1 Avionics Weight	-6.00 Y	-14.11 R	-4.76	-11.53 R	2	0.95	0.93 Y
7.1 Aircraft Endurance	-4.17	-7.75 Y	1.69	-1.69	5	0.70	0.97
8.1 Aircraft Range	-4.71	-7.02 Y	-2.30	-4.41	3	0.60	0.98
9.1 Aircraft Speed	-13.33 R	-16.48	-7.41 Y	-9.91 Y	3	0.60	0.97
*TPM Informed with TRL factor		Without TRL factor		Without TRL factor			
1.1 Aircraft Weight	-1.67	-4.65	1.69	-1.21	7	1.00	0.97
2.1 Airframe Structure	-2.00	-5.50 Y	-2.72	-5.95 Y	7	0.93	0.97
3.1 Weapons Load	-2.00	-2.62	2.56	1.95	2	0.60	0.99
4.1 Cooling Capacity	-3.45	-15.20 R	-3.33	-13.19 R	2	0.50	0.90 Y
5.1 Display Functionality	-17.14 R	-18.16 R	-17.65 R	-18.35 R	1	0.10	0.99
6.1 Avionics Weight	-6.00 Y	-10.36 R	-4.76	-8.52 Y	2	0.95	0.95
7.1 Aircraft Endurance	-4.17	-6.13 Y	1.69	-0.19	5	0.70	0.99
8.1 Aircraft Range	-4.71	-5.98 Y	-2.30	-3.47	3	0.60	0.99
9.1 Aircraft Speed	-13.33 R	-15.06 R	-7.41 Y	-8.50 Y	3	0.60	0.99

**FIGURE 6. Comparison of Cost and Schedule Summaries With and Without the TRL Factor**

that are 7 or higher, we took the percent management reserve as an indicator of the perceived risk and applied it to all the TRLs we assumed to be in this range. The new WBS to TPM Correlation is in Figure 5 and the new Data Summary in Figure 6 (see preceding page).

Note that there were only minor changes in the color-coding, although most of the numbers turned more negative because the TPMs were not on their planned profiles and the TRLs were fairly high. This shows that if you have TPMs that are not meeting their estimated planned progress and the supporting technology is less mature (higher risk), you can expect a larger impact on cost and schedule for the earned value control accounts supporting this work effort.

Once again, you get an earlier indication of potential problems.

### **Lastly, Systems Engineering**

The role of systems engineering in this process cannot be over emphasized. According to the Defense Systems Management College, *Systems Engineering Fundamentals Guide* of January 2001, the WBS is a product of the systems engineering process. So are requirements analysis and traceability, functional analysis and allocation of verifiable performance requirements, and also system verification. These functions are all critical to the establishment of the technical baseline, KPPs, and the TPMs that are an indicator of technical baseline integrity.

Almost invariably, when a program gets in trouble, the analysis of what went wrong includes inadequate or non-existent systems engineering. This is simply due to not recognizing the need for proper planning and the role systems engineering plays in reducing uncertainty and performance risk. I believe if

well-structured programs use systems engineering to provide properly developed TPMs that allow for computation of technical variance, this can complement and modify, through a quantitative link, the earned value cost and schedule variances that are used for program management. This will make for a well-defined technical baseline that can provide the basis for cost and schedule revisions and be an early determinant of risk and future problems.

Then technical estimates will be used in a systematic, integrated fashion to help program managers address the right issues, anticipate the right challenges, and make the right decisions.

Editor's Note: Ferraro welcomes questions or comments on this article. Contact him at [mferraro@hq.dcmamil](mailto:mferraro@hq.dcmamil).

## **TWO DAU CIVILIANS EARN 35-YEAR SERVICE AWARDS LOU JONES AND DENNIS COX RECOGNIZED AT DEC. 11 CEREMONY**

**D**uring a ceremony conducted in Howell Auditorium on Dec. 11, 2002, DAU President Frank Anderson Jr. presented Lou Jones and Dennis Cox, DAU Operations Group, with certificates in recognition of 35 years' federal civilian service. Jones is a member of the Information Technology Department and is the longest-serving federal civilian employee at DAU. Cox works in the Contracting and Logistics Department.



DAU President Frank Anderson Jr. (left), presents Lou Jones a certificate recognizing his 35 years of federal civilian service.

Anderson (left) presents Dennis Cox a certificate recognizing his 35 years of federal civilian service.



# INTERNATIONAL SOCIETY OF LOGISTICS (SOLE) “LOGISTICIAN OF THE YEAR”

*DAU Logistics Management Professor Named Top Logistician for 2002*

**T**he Greater Washington Area Chapter (GWAC) of the International Society of Logistics (SOLE) named Air Force Lt. Col. Steven Brown, Certified Professional Logistician, as the winner of its most prestigious award—Logistician of the Year. He is a Defense Acquisition University (DAU) Professor of Logistics Management, DAU Capital and Northeast Region, and served two terms as the Vice Chair for Education and Training of the Fort Belvoir SOLE Chapter.

Brown was selected as Logistician of the Year for his numerous contributions to the advancement of logistics education and training as well as for his many contributions to SOLE. As a Professor of Logistics Management, he excelled at fielding leading-edge defense logistics management knowledge and tools for DAU while instructing DoD and defense industry students in a full spectrum of acquisition and logistics courses. Among the many educational opportunities he has offered as SOLE's Vice Chair for Education and Training, he recently directed a 23-week logistics review course for 46 local logisticians. Due to his many talents and contributions in the field of logistics, Brown was also selected this year to be a DAU Research Fellow. He and his associate fellows are currently attending the SES Fellows Course at Kennedy School of Government, Harvard University, and will be collaborating with MIT, Eastern Michigan University, and the University of Kentucky in researching best practices and lean implementation processes and tools for use within the acquisition environment.



Air Force Lt. Col. Steve Brown (right), a professor at the DAU Capital and Northeast Region, Fort Belvoir, Va., receives the “Logistician of the Year” award from Army Gen. Paul Kern, Commanding General, U.S. Army Materiel Command. The award was presented at the Greater Washington Area Chapter of the International Society of Logistics fifth annual awards ceremony on Oct 30, 2002, at the Fort Myer Officers’ Club, in Arlington, Va.

Photo by Joyce McCallister

# Making the Acquisition Warrior Fully Mission Capable

## System Program Office Leveraging Web-based Technology to Strengthen Its Training Program

COL. DONALD J. "BUD" VAZQUEZ, USAF (RET.)  
CAPT. BRIAN C. PAYNE, USAF

In the acquisition business we have always struggled with training. Not so much formal training, which tends to be plentiful and generic, but the informal training needed to specifically do one's current job, and to do it better. While formal training is much improved, the intervals between opportunities tend to be long, and Operations Tempo (OPSTEMPO) often takes precedence. The discipline for what could be called "continuation training" is largely ad hoc. The "menu" is often nice-to-know "gravy" instead of "meat and potatoes."

### "Continuation Training" Lacking

In the flying world of today's Air Force, commanders know the status of each aircraft as well as which aircrew members are ready and trained for the missions. To address this lack of "continuation training," one System Program Office (SPO) in the Electronic Systems Center (ESC) at Hanscom AFB has developed and employed an innovative, Web-based program to track individuals' training levels. Just as the Air Force deems aircraft "Fully Mission Capable" based on maintenance parameters, ESC's Global Air Traffic Operations/Mobility C2 (GATO/MC2) SPO has extended this concept into the acquisition training arena.

### A Tool to Track Mission Capable Status

We all know that we must balance formal training with informal, "On-the-Job" Training (OJT). In ESC/GA, we introduced these concepts to ensure we

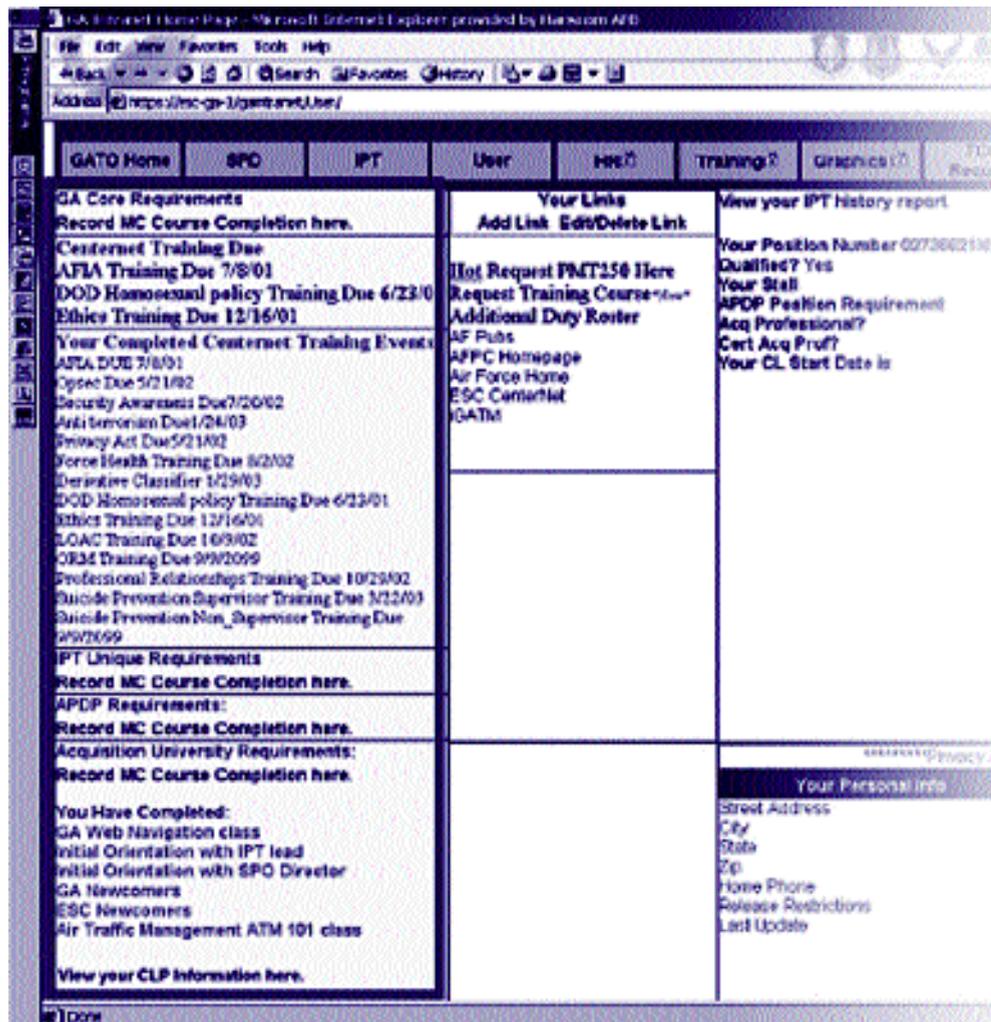


FIGURE 1. User Only View of Personal Training Portal

*Vazquez is a former Director of the Global Air Traffic Operations (GATO)/Mobility C2 (MC2) System Project Office at Hanscom AFB, Mass., a position he held from May 2000–June 2002. A graduate of the U.S. Air Force Academy, he holds a Bachelor's and three Master's degrees. Currently, he is a partner in IPT Associates Inc, in Boston, Mass.*

*Payne is a Special Projects Officer assigned to the GATO/Mobility C2 (MC2) Systems Program Office at Hanscom. He holds a Master's in Public Policy from the John F. Kennedy School of Government, Harvard University; and a Bachelor of Science from the U.S. Air Force Academy.*

focused on the right kind of training, at the right time.

Evaluating its “weapons systems” (in this case, people) based on a combination of factors—including Acquisition Professional Development Program (APDP) training, Professional Military Education (PME), formal education, and OJT—GATO/MC2 has developed an innovative Web-based tool to systematically track its employees’ Mission Capable status vis-à-vis acquisition requirements. Using individual workstations, supervisors and members can instantaneously gauge their team and individual real-time status, respectively, in real time.

### **Improving Acquisition Training by Leveraging Technology**

Training is crucial in any profession, but is particularly imperative in the unique and specialized world of acquisition, especially given declining entitlements. No amount of formal education will equip even the sharpest new troop to become a “seasoned” veteran. The Air Force could stand to improve the informal OJT of its acquisition officers.

In the world of lean SPOs and increasing demands on acquisition to become faster, better, and cheaper, we can and must construct an acquisition foundation upon which to undergird our workforce—or prepare to suffer the consequences. The Command and Control (GATO/MC2) System Program Office, often referred to as ESC/GA, has taken a lesson from the operational world and applied it to acquisition, leveraging Web-based technology to strengthen its training program.

### **Mission Capable in the Operational Environment**

For individual Air Force weapons systems, such as the F-16, the pinnacle of performance occurs when the system is determined to be Fully Mission Capable (FMC). At this point, the weapon system can accomplish all of the missions that it’s expected to perform.

If certain critical subsystems are inoperable, maintainers cannot rate the en-



tire weapon system FMC. However, depending on the criticality of the dysfunctional component, an aircraft might still be mission-worthy in a Mission Capable (MC) or Partially Mission Capable (PMC) state. That is, while not at optimal performance, the weapon system can still fulfill at least some of its mission requirements.

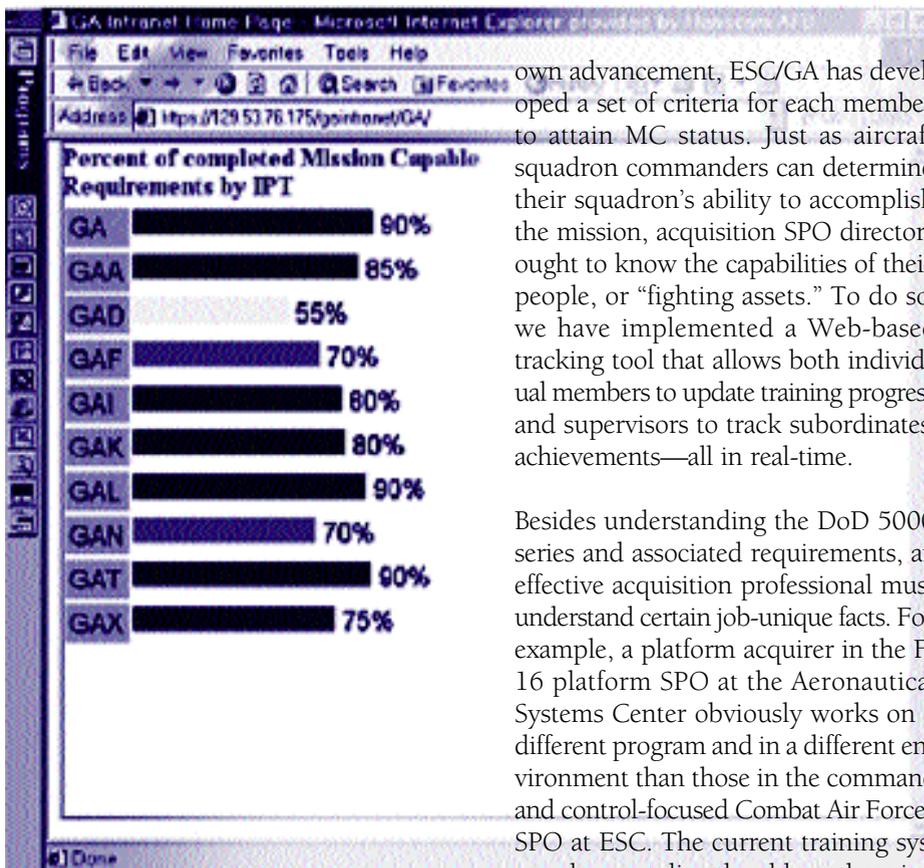
There also exist MC rates at the squadron and wing levels. Depending on what percentage of the unit’s individual aircraft are mission-ready, the squadron or wing is either FMC or MC. Thus, at any point in time a squadron commander can determine what proportion of assets are available for combat and to what degree these assets can perform. Fortunately the top-tier Air Force maintenance community keeps our aircraft operating better than any others in the world. As acquirers, we ought to “steal shamelessly” from their playbook.

### **Is There a Hole in the Current Acquisition Training Mix?**

Just as there are maintenance and performance metrics for Air Force weapons systems, there are analogous training milestones for Air Force acquirers. This “maintenance” for the acquisition weapon system comes in the form of training people. Thankfully, the APDP currently exists to provide a broad training base in various acquisition-related disciplines, such as Program Management, Systems Engineering, and Test & Evaluation (13 in total). Professionals can obtain up to a Level III certification in each discipline.

Despite this solid but general training foundation, experience has shown that even some Level III-certified individuals are not immediately ready for acquisition combat, so to speak. These professionals still need to be trained on the particular systems, programs, and environment that comprise their current job. And the faster we get them ready, the faster we can win the acquisition battle!

To be clear, there is no dearth of training. The problem is it’s either not di-



**FIGURE 2. All Personnel View of Completion Rates**

rectly related to doing current tasks or it's too far off or too far past to impact today.

Beyond APDP, Air Force acquisition professionals have a myriad of mandatory Air Force- and base-wide training from which to choose, but unfortunately such training is often not directly related to the core acquisition mission. For example, the litany of mandatory annual training requirements includes topics like Suicide Prevention, Anti-Terrorism, Classification, Ethics, and Family Liaison Officer. Also, the Air Force mandates PME at certain points, and graduate degrees have become almost imperative for career progression. All of these training requirements are important, but few—if any—are aimed at helping the SPO with its current work.

**ESC/GA's Mission Capable Acquisition Training Program**

To both fill the holes in this “swiss cheese” of general APDP, PME, and Air Force-mandated training and hold individuals accountable for ensuring their

own advancement, ESC/GA has developed a set of criteria for each member to attain MC status. Just as aircraft squadron commanders can determine their squadron's ability to accomplish the mission, acquisition SPO directors ought to know the capabilities of their people, or “fighting assets.” To do so, we have implemented a Web-based tracking tool that allows both individual members to update training progress and supervisors to track subordinates' achievements—all in real-time.

Besides understanding the DoD 5000 series and associated requirements, an effective acquisition professional must understand certain job-unique facts. For example, a platform acquirer in the F-16 platform SPO at the Aeronautical Systems Center obviously works on a different program and in a different environment than those in the command and control-focused Combat Air Forces SPO at ESC. The current training system does not directly address these important nuances. Consequently, ESC/GA required that a team member must complete the following training, *and do it within 30 days of arrival*, to be “Mission Capable” in our SPO:

**ESC Newcomers Briefing.** Provides overview of entire product center and enables understanding of how SPO fits onto ESC Commander's radar; provides Center's Vision, Mission, and Goals/Objectives.

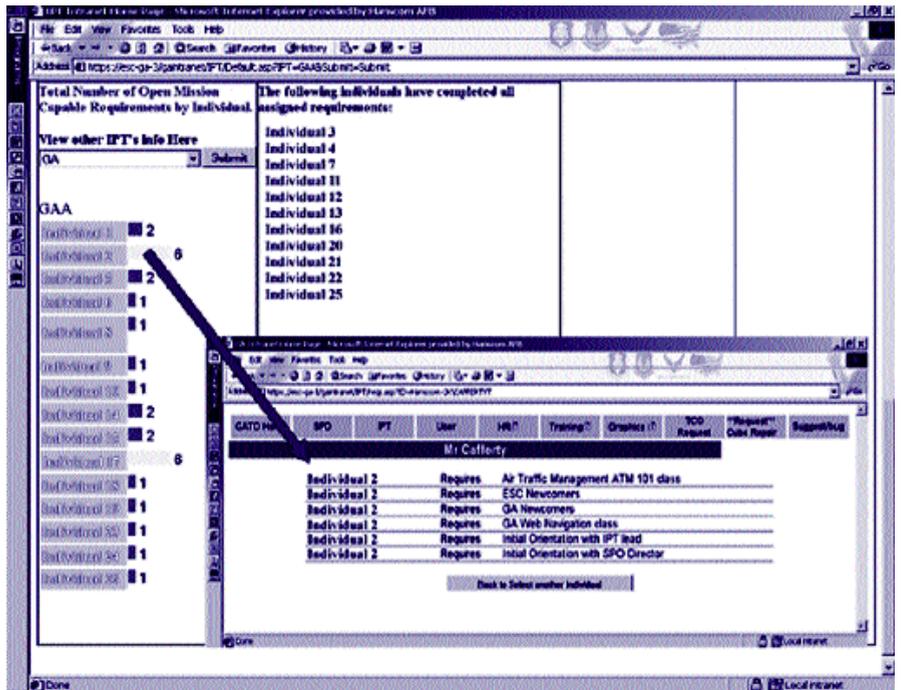
**GA Newcomers Briefing.** Gives overview of all Integrated Product Teams (IPTs), with member from each respective IPT briefing the team's role/mission; provides SPO's Vision, Mission, and Goals/Objectives. Note: Briefing is done directly from the Web!

**Initial Orientation with SPO Director.** Enables member to learn leader's philosophy and how specific job and IPT fit into SPO.

**Initial Orientation with IPT Lead.** Enables member to understand how specific job fits into context of 3-letter level team.

**Air Traffic Management 101 Class.** Given by SPO's Chief Engineer, ESC/GA's focus is on systems that enable safe flight worldwide, and all members must have exposure to Air Traffic Management concepts in order to work specific programs that comprise Air Traffic Management.

**GA Web Navigation Class.** As the Air Force's Integrated Digital Environment (IDE) leader, ESC/GA members are



**FIGURE 3. By-Name Mission Capable Status for Each Team Member**

trained to work from the Web from the outset.

### **ESC/GA's Mission Capable "Training Tool—"User" View**

We empowered SPO individuals and supervisors to track their status vis-à-vis these MC requirements. Figure 1 on p. 22 shows what an individual sees when entering their personal training portal. This particular individual has completed all Mission Capable training requirements, as seen in the lower left-hand corner in the "You Have Completed" section. Any training that had not been completed would be listed under "GA Core Requirements" in the upper left-hand corner.

Although the MC training requirements are the origin of this Web-based tracker, its functionality is obviously much broader. From Figure 1, this individual can also view, complete, and update training required by the Product Center ("Centernet Training Due" and "Your Completed Centernet Training Events").

In the lower left corner where it reads, "View your CLP [Continuous Learning Points] Information Here," the user can see how many of ESC/GA's Wednesday Schools they've completed. Every Wednesday our SPO has a variety of acquisition OJT "core" classes such as contract types, source selection, PPBS [Planning, Programming, and Budgeting System], etc., as well as general Air Force topics. Also, the individual can customize the "Your Links" section with the Web links that they most use and need. Finally, and not training-related, job and personal information is available and updated with ease on the right-hand side of the screen.

### **System Program Director (SPD) View**

As useful as the training tracker is for individuals, its value also extends to supervisors. By clicking on the "SPD" tab in the top-left portion of Figure 1, we arrive at Figure 2 (preceding page), which all personnel in the organization can view.

Although personal information on the right-hand side of the screen remains

the same, the individual MC tracking is replaced by completion rates for each of the organization's three-letter offices, or IPTs. The System Program Director has an instantaneous view by team of each IPT's MC rate, similar to the squadron commander's snapshots of aircraft status.

### **"IPT" View**

For mid-level supervisors, one part of the tool's value comes when clicking on their respective IPT's colored bar. In doing so, they get the by-name MC status for each team member, as depicted in Figure 3 (preceding page). Furthermore, they can see each individual's remaining and completed MC requirements. Thus, the Web-based tool is a means to ensure the highest organizational proficiency by tracking each individual member's progress.

### **Training + Technology = Future Success**

ESC/GA's training requirements and tool for tracking MC acquisition professionals provides a basis for an ever-evolving and ever-improving training process. It will continue to sharpen the point of the Acquisition training spear by evolving as we polish "MC" requirements in the acquisition world. As for GA's tool, the training tracking functions are only a fraction of its potential capabilities. The SPO is currently developing its criteria for "Fully Mission Capable" status that would take on the requirements of the specific IPT. For example, the National Airspace System (NAS) IPT may "require" a new arrival to visit a Radar Approach Control (RAPCON) to reach "FMC."

It's critical that the acquisition community leverage both the world-class training that has made our operators the world's best and the cutting-edge technology that is the spine of this country. We hope these GA processes provide a springboard for you to say, "Oh yeah? We can beat that!"

Editor's Note: The authors welcome comments on this article. Contact them at [Bud.Vazquez@hanscom.af.mil](mailto:Bud.Vazquez@hanscom.af.mil) or [Brian.Payne@eglin.af.mil](mailto:Brian.Payne@eglin.af.mil).



# Organization of the Joint Technology Office

## Finding the Right Model for an Integrated, Coordinated Investment Strategy

LT. COL. JOHN B. WISSLER, USAF

In fiscal 2000, the Office of the Deputy Under Secretary of Defense for Science and Technology, ODUSD(S&T), established the High Energy Laser Joint Technology Office (JTO) to advocate and execute a High Energy Laser technology investment strategy for the Department of Defense. While DoD establishes joint acquisition program offices fairly frequently, the JTO is basically the first of its kind, as this article will show. Our foremost consideration, obviously, is how the JTO can organize to best accomplish its mission.

In this article, I first explain what the JTO is and then offer and evaluate possible organizational models. Although the JTO is focused on High Energy Lasers, DoD will almost certainly establish other JTOs in the future, focused on other joint technical issues and organizational considerations. Our experiences may prove of value to those future organizational planners tasked with the important job of standing up a new JTO.

### The JTO—Composition and Mission

In September 1999, at the request of Congress, the Under Secretary of Defense (Acquisition, Technology and Logistics), USD(AT&L), chartered the High Energy Laser Executive Review Panel for the purpose of studying DoD High Energy Laser technology development. The panel was composed of high-level



Airborne Laser

laser technology experts in and out of the government.

In its "Report of the High Energy Laser Executive Review Panel Department of Defense Laser Master Plan," published

in March 2000, the panel found insufficient funding for adequate research, a fragile national industrial base for High Energy Lasers, and little or no coordination with the national laboratories. Among its recommendations, the panel

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suggested the DoD adopt a new, central management structure formed around an office charged with the responsibility for managing a joint program to revitalize the High Energy Laser S&T investment.

This office would also advocate appropriate funding and stimulate the industrial base with focused investments. It would be supported by Technology Area Working Groups, which would concentrate on six Service-led technology



areas: Advanced Technologies, Beam Control, Chemical Lasers, Free Electron Lasers, Lethality, and Solid State Lasers.

### **Composition**

The JTO, formed on June 6, 2000, is an extremely small and lean office comprised of six full-time people: an SES-level director, an executive assistant, a business manager, and three lieutenant

colonel/commander-level Service representatives (one each from the Army, Navy, and Air Force—Marine and Defense Agency representation is on a part-time basis). Understandably, an effective division of labor is especially critical to accomplishing its mission.

### **Mission**

According to Dr. George Ullrich, the first JTO Director, the JTO's mission is:

*“To serve as the DoD High Energy Laser advocate and develop/execute a High Energy Laser investment strategy that builds on existing Service/Defense Agency programs [while exploiting] promising new technology developments for multi-Service High Energy Laser weapon system applications.”*

### **Integrated Business Process**

The JTO developed an integrated business process that includes strategy development, review, and validation by successively higher authorities within DoD (Figure 1). Under this process, the JTO integrates and coordinates an investment strategy the Technology Area Working Groups develop and prioritize in response to requirements and opportunities (i.e., technology assets).

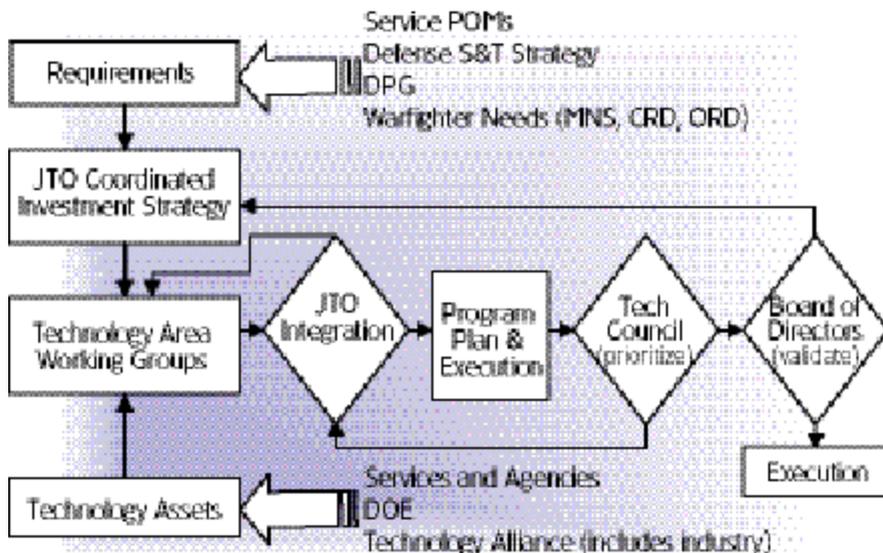
A Technology Council, comprised of the Service S&T executives or their representatives and chaired by the DUSD(S&T), reviews and prioritizes this strategy. Following review and if required, the JTO then presents the plan to the Board of Directors—comprised of the Service Acquisition Executives and chaired by the USD(AT&L)—for validation and final approval.

Once the investment strategy is approved, the JTO executes it via a competitive process designed to award funding to the best technical proposals that fit within the investment strategy. The funds are actually executed by government, university, and industry laboratories.

### **Congressional Influence**

As with any program, outside forces also influence the JTO, not the least of which is Congress, which has a great interest in

***Under an integrated business process, the High Energy Laser Joint Technology Office integrates and coordinates an investment strategy developed and prioritized by the Technology Area Working Groups in response to requirements and opportunities (i.e., technology assets).***



**FIGURE 1. High Energy Laser JTO Business Process**

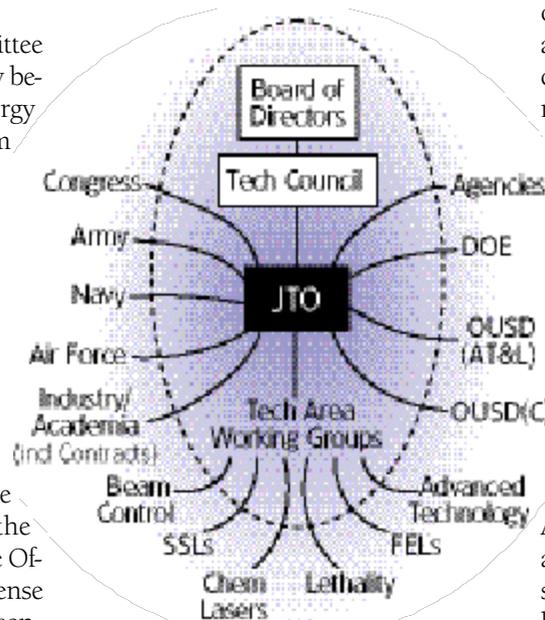
High Energy Laser weapons development. In particular, the New Mexico delegation made concerted efforts to increase funding for High Energy Laser technology development in the United States, and pushed for the establishment of a new center of excellence in directed energy weapons, which includes High Energy Lasers at Kirtland AFB, N.M.; these efforts culminated in the Directed Energy Coordination and Consolidation Act of 2000, S.2573, of the 106<sup>th</sup> Congress.

The Senate Armed Services Committee also expressed an interest, primarily because of the potential for High Energy Laser-based weapons to transform warfare. This interest was clearly expressed in Section 211 of the fiscal 2001 Floyd D. Spence National Defense Authorization Bill.

**PPBS Interaction**

The JTO must also interact with various Pentagon organizations via the Planning, Programming, and Budgeting System (PPBS). Two of the most critical organizations are OUSD(AT&L), which sponsors the High Energy Laser program, and the Office of the Under Secretary of Defense (Comptroller), or OUSD(C), which controls program funding. These interactions are especially important during the programming and budgeting phases of the PPBS.

The Services, particularly the Air Force, have a substantial investment in High Energy Laser technology development. The Air Force funding totals approximately \$65-70 million per year for directed energy technology development in general, \$35-40 million of which is for laser development. The Air Force also executes two large acquisition programs for the Missile Defense Agency—the Airborne Laser and the Space-based Laser—which, according to news releases, total approximately \$1 billion.



**FIGURE 2. Modified Interrelationship Digraph for the High Energy Laser JTO**

**Influence of Industry/Academia**

As partners in any technology development effort, industry and academia are also forces that the JTO must address, both because they do much of the work and because of their ability to advocate funding via the legislative process. However, much of the JTO's direct relationship with industry and academia centers on managing JTO-funded research and development contracts.

**Influence of High-Level Panels/Study Groups**

Finally, because of the High Energy Laser program's visibility, there are inevitably briefings to, and requests for information from, high-level review panels and study groups such as the Technology Area Review and Assessment panels and the Defense Science Board. These relationships can be mapped using a variation of the Interrelationship Digraph described in Brassard and Ritter's *The Memory Jogger II*.

Figure 2 shows my view of how this mapping would look. It displays the diverse array of entities with which the JTO must interact—extending from the field agencies (Army, Navy, and Air Force laboratories) to the Pentagon and Congress. It is critical to understand that all of these agencies can either be the JTO's allies or its adversaries as it attempts to carry out its mission. Thus, adequately managing all of these relationships is vital to the effective day-to-day functioning of the JTO and its activities.

The real question, then, is how to organize the JTO so it can do this, especially since only four full-time technical people work in the JTO, one of whom is the Director with all the responsibilities inherent to that type of position.

**Possible Organizational Models**

An organizational structure designed to accommodate the environment and mission just described must satisfy the following requirements:

- It must be lean, so that as much of the JTO's funds as possible go toward High Energy Laser development at

government, university, and industry laboratories.

- It must maximize the JTO's effectiveness at developing and executing its investment strategy.
- It must address the stakeholders' and other interested parties' concerns regarding High Energy Laser development.
- It must be a clean, clear organizational structure, with a minimum of overlap in responsibilities.
- It must work effectively with the JTO's personnel.

Four alternative models potentially provide an overall philosophical framework from which an organizational design can flow. Under all these models, certain roles are constant:

- First, the JTO Director leads the office and is the primary interface with the Technology Council, the Board of Directors, and other higher-level officials in and out of the government.
- Second, the Business Manager handles the details of the JTO's day-to-day business, i.e., finance, accounting, and contracts.
- Third, the Executive Assistant provides executive support to the JTO. Thus, the four models outlined in the following discussion concentrate mainly on the roles of the JTO's three military representatives.

### Technical Area Model

The first model is the **Technical Area Model**, which is oriented around the Technology Area Working Groups (Figure 3). Under this model, all activities in a given technical area, to include the Groups' activities, are the responsibility of a given person. The six technical areas are divided evenly among the three military members, who are responsible for monitoring all the contracts in the area, as well as all planning, programming, and budgeting for those areas. They are also the JTO's representatives on the Technology Area Working Groups. In effect, the Technical Area Model gives each representative the task of being the JTO's expert in a given technical area.

The JTO Director maintains the only top-level, program-wide view, and addresses cross-cutting technical and strategic issues with the assistance of each technical area manager as required. Direct higher headquarters interactions are handled by the Director, but support is divided among the three military members according to their area of technical responsibility.

### Functional Area Model

The second organizational model is the **Functional Area Model**, shown in Figure 4 (see p. 30). Under the Functional Area Model, I will consider the following major functions: Contract Management of the technical efforts executed by industry and government laboratories; PPBS and Strategy Development, including preparing and defending budgetary submissions and interacting with the rest of the Department staff; and Service and Agency Program Monitoring, including assessing gaps and shortfalls and managing the Technology Area Working Groups' activities. Again, the Director addresses overall, cross-cutting technical and strategic issues. However, unlike the Technical Area Model, the Director develops investment strategy as part of a three-member team.

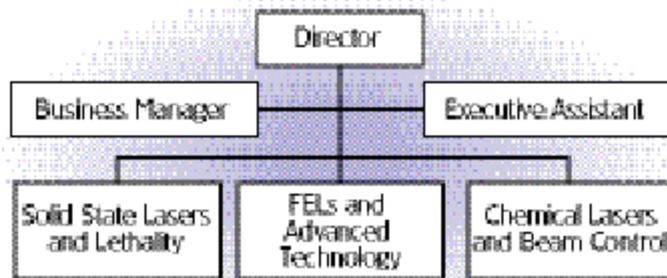
- First, the Service and Agency Program Monitoring assesses existing programs and works with the Technology Area Working Groups to develop a list of opportunities for JTO investment.
- Second, the Director reviews and integrates the list, possibly with the help of the chairs from the Working Groups.
- Finally, using the investment strategy as a starting point, the PPBS and Strat-



egy Development function develops budgetary input for the PPBS. Under the Functional Area Model, the PPBS and Strategy Development function and the Director share responsibility for higher headquarters' interactions.

### Service/Agency Model

The third organizational model is the **Service/Agency Model**, in which the JTO is organized so that all activities, whether they are monitoring, contracting, program planning, or developing strategy, are divided by Service or Agency (Figure 5, p. 30). Under this model, military members are responsible for their Service's JTO-funded activities. This includes all Technology Area Working Group activities for which their Service



**FIGURE 3. Technical Area Model Structure**

has the lead, and for being away from Service's own High Energy Laser related activities. As before, the Director handles overall cross-cutting issues and strategy, and like the Technical Area Model, does so as the only individual with the overall view.

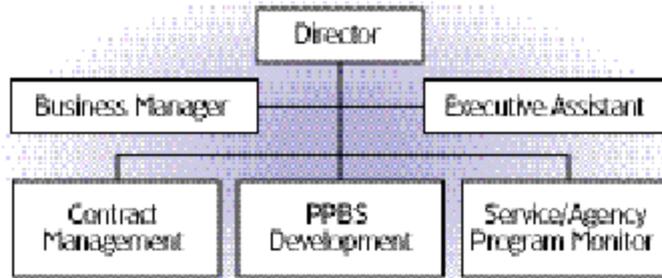
Thus, the JTO would develop its investment strategy in much the same way as with the Technical Area Model; military members advise the Director on their Service's area, but the Director actually develops the investment strategy. The Director also interacts with higher headquarters, with assistance from the JTO's Service representatives as required.

### Funding/Program Model

The fourth model, shown in Figure 6 (p. 31), is the **Funding/Program Model**, in which two of the JTO's Service representatives essentially fill a role very much like the Air Force's Program Element Monitors (PEMs). One PEM handles all Basic (6.1) and Applied Research (6.2) in High Energy Lasers, regardless of executing agency, as well as monitoring contracts funded by the JTO's 6.1 and 6.2 funds.

The second PEM does the same for Advanced Technology Development (6.3). Under the Funding/Program Model, the PEMs split the Technology Area Working Group coordination between them, with each PEM taking three of the Working Groups according to their areas of expertise. In the course of their duties, the PEMs maintain an in-depth knowledge of their parts of the overall program.

The third position is the PPBS manager, who plans, programs, and budgets for the overall High Energy Laser program and serves as the primary interface to the PPBS. In this role, the PPBS manager has a top-level, cross-cutting view of the program, but is not necessarily cognizant of the details. In addition, this individual assists the JTO Director in developing the overall investment strat-



**FIGURE 4. Functional Area Model Structure**

egy; the PEMs assist the PPBS managers as required. The Director and the PPBS manager also handle interactions with higher headquarters.

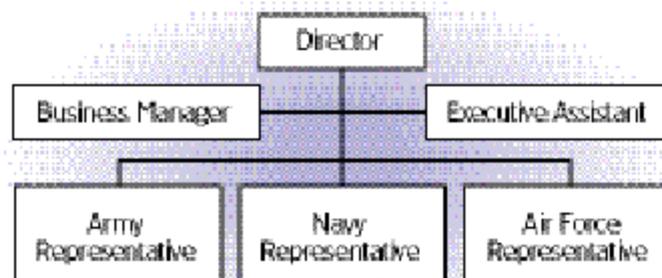
### How Well Might These Models Work?

Before I evaluate the four models, I need to develop criteria based on the JTO's needs and situation, although some criteria are general in nature and should be considered regardless of the organization. The criteria I used as I thought about how we might organize the JTO follow:

**Mission:** Does the structure impede the JTO's mission or enhance it ("advocate and develop/execute a High Energy Laser investment strategy")?

**JTO Interface:** Does the structure allow adequate interfacing with the Technology Council and Board of Directors within the JTO mission area?

**External Interface:** Does the structure allow adequate interfacing with the OSD staff, the Services, and Congress for the purposes of advocacy and gaining support?



**FIGURE 5. Service/Agency Model Structure**

**Efficiency:** Are there areas in which there is duplication of effort, thereby most likely leaving other areas without coverage? Is workload balanced?

**Lines of Authority:** Are responsibility and authority clear and relatively unambiguous?

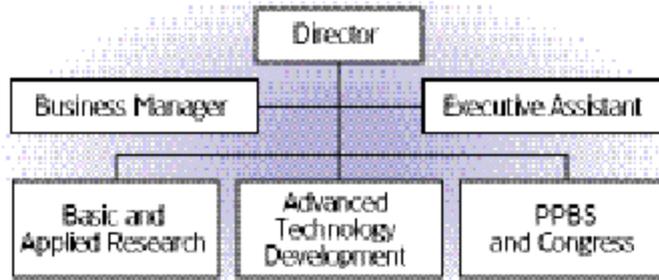
**Empowerment:** Are people empowered to do a "whole job?" Or, are jobs arbitrarily split between people in ways that are counter to the mission?

Using the criteria just described, I rated each model on a numerical scale as to how well the model satisfies the criteria (3 for poor, 6 for fair, and 9 for good). Under most circumstances, this exercise would be best done using Brassard and Ritter's nominative group technique, perhaps as part of an off-site. For purposes of this article, the evaluation represents my opinion only. However, should a JTO for a different technology area be organized, it may be useful to use the nominative group technique at an off-site as a means of engaging the members of the new JTO in deciding their organizational structure.

As shown in Figure 7 on p. 31, I did the evaluation in two steps. The first step involved working through each model, criterion by criterion, and assigning a rating of 3, 6, or 9 for each criterion. Next, I refined this initial rating by ranking each model within each criterion such that one model is a "3," two models are "6's," and one model is a "9." In this manner, I was forced to choose which model is the weakest in a particular area, which two are mediocre, and which one is the best.

The evaluation, while admittedly subjective, offers us a choice in that it supports the use of the Technical Area Model, Functional Area Model, or the Funding/Program Model structures. This choice de-

depends on whether one wants on the technical issues relate High Energy Laser development; cover, in a broad fashion, the specific tasks of the JTO; or focus on the investment strategy and advocacy issues related to High Energy Laser development.



**FIGURE 6. Funding/Program Model Structure**

For example, the Technical Area Model structure increases presence in a given technical area, across all program types (i.e., 6.1, 6.2, 6.3), but it is probably weaker from a strategy development viewpoint since the Director is the only individual who has an across-the-board view of the JTO mission area.

The Functional Area Model structure provides good coverage of the functional areas that are part of the JTO mission and permits specialization by each military member in each area. Investment strategy development and advocacy are enhanced because three individuals are involved. However, technical insight is weakened because the Technology Area Working Groups' responsibilities are not specifically assigned. Furthermore, the contract management function is placed on one person, which means the JTO's ability to manage contracts could be compromised since it is very rare that one person possesses the expertise to effectively monitor all technology areas.

The Functional Area Model structure reduces presence in the technical areas as compared to the Technical Area Model structure, since two people share

the six technical areas. However, it enhances strategy development and advocacy because these cross-cutting areas are shared by two people, with the planner handling the details and the Director handling the overall strategy and interface with the Technology Council and the Board of Directors.

The Service/Agency Model structure is the only organizational model that is clearly inferior, mainly because it discourages the joint philosophy and outlook that is important in any joint office. It also fails to recognize the vastly different investment levels between the Services and is weak from a strategy development and advocacy perspective because the Director is the only individual who has the broad view across all Services and technical areas.

**The Four Models—A Starting Point**

To summarize, the choice of an organizational structure for a new, small, cross-cutting JTO is ultimately dependent on

tor's assessment of the JTO staff members and their mission. It may be that two of the models could be overlaid on each other, with one model providing a structure for primary duties and the second model providing a structure for secondary duties. However, regardless of the model the Director chooses, it is critical that the organizational structure allow the office to meet its highest priority commitments. In reality, the four models represent starting points for discussions regarding organizational structure of these new, smaller joint offices, which could represent a new way of managing technology development within DoD.

director chooses, it is critical that the organizational structure allow the office to meet its highest priority commitments. In reality, the four models represent starting points for discussions regarding organizational structure of these new, smaller joint offices, which could represent a new way of managing technology development within DoD.

**Postscript**

You may be wondering how the JTO is now organized. The topic of organization came up at a January 2001 JTO off-site, at which time I presented the four models. After much discussion, the Director adopted the Technical Area Model approach, mainly to emphasize the JTO's technology development and advocacy mission.

While this approach has worked well to date, I recommend (and intend to practice) the strategy of revisiting the issue of organization periodically as the program matures and people come and go. An organizational model that worked well early in a program may be less appropriate later in the program life cycle.

Editor's Note: Wissler welcomes questions or comments on this article. Contact him at [John.Wissler@osd.mil](mailto:John.Wissler@osd.mil).

**FIGURE 7. Evaluation of Structure Models**

Model Criteria	Mission	JTO Interface	External Interface	Joininess	Strategy	Efficiency	Lines of Authority	Empowerment	Sum	Comments
Technical Area	6	9	3	9	6	6	9	6	54	technology areas covered, but focus is internal; not enough emphasis on advocacy
Functional Area	6	3	6	6	9	9	6	9	54	externally oriented; good advocacy; weak tech insight; contract mgt workload high
Service/Agency	3	6	6	3	3	3	3	3	30	too Service-oriented; encourages stove-piping; strategy/tech insight weak
Funding/Program	9	6	9	6	6	6	6	6	54	good coverage for external stakeholders, strategy; may be confusing to non-AF

# Affordability Through Commonality

## Army and Navy Programs Coordinate Acquisition of Improved and Affordable Guided Munitions

CAPT. HERB HAUSE, USN • CHRIS GRASSANO

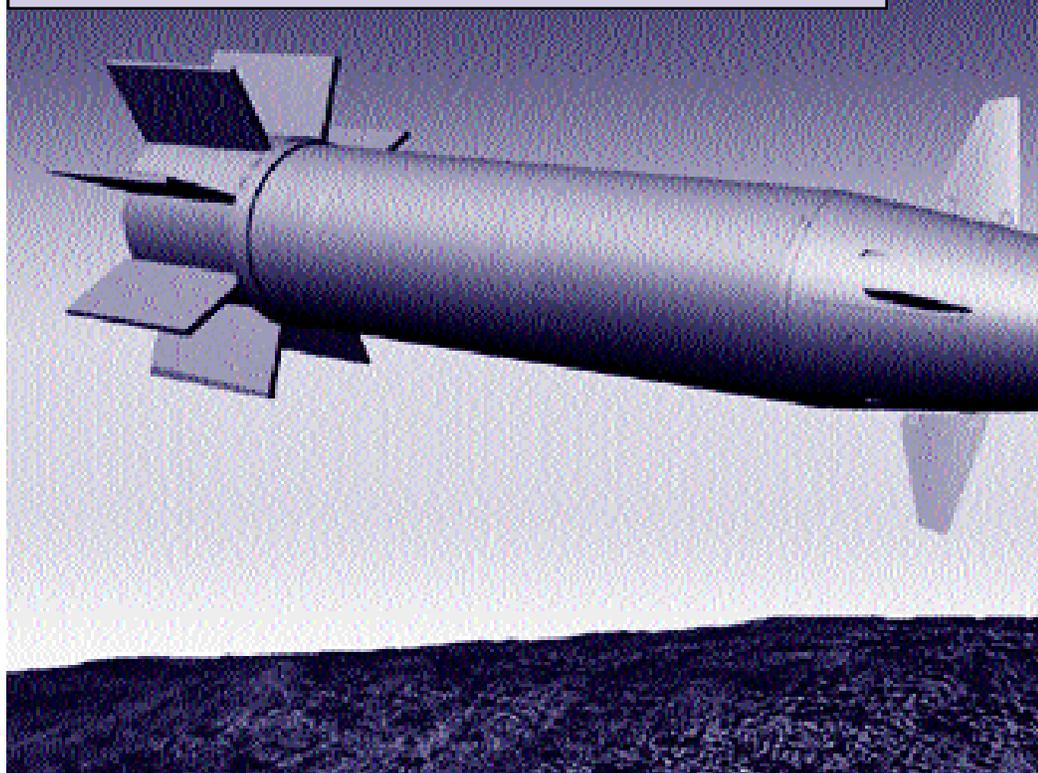
**T**he Army and Navy have literally joined forces to develop a common approach for improved fire support capability through cooperative acquisition, development, and testing of guided munitions for both Army artillery and Naval gunfire. Affordability through commonality is the banner, and the desired end-state is more affordable and capable guided munitions for the warfighter.

### Commonality Initiative Formalized

While the early groundwork for this dual-Service effort was started in 1997, it really got off the ground in 1999 when a commonality initiative was formalized with a Memorandum of Agreement (MOA) between the Department of the Army Tank-Automotive and Armaments Command—Armament, Research, Development and Engineering Center (TACOM-ARDEC) Fire Support Armaments Center (FSAC); the Program Manager for Artillery Munition Systems (PM-ARMS); the Navy's Program Manager for Naval Surface Fire Support (PMS529); and the Office of Naval Research.

The intent of the original MOA was to establish a framework for developing guidance and navigation technology for the Navy's Extended Range Guided Munition (ERGM/EX-171) and the Army's Excalibur (XM-982). A second key objective was to mitigate lethality, reliability, and safety issues related to the M80 Grenade Submunition and incorporate

The XM 982 Excalibur is being developed by Raytheon Missile Systems of Tucson, Ariz. Excalibur will be a family of modular precision-guided extended range artillery projectiles with three distinct payloads. A unitary warhead will be used against personnel, equipment, and building targets in urban or complex terrain. A sensor-fuzed munition variant will engage self-propelled artillery and armored vehicles. A dual-purpose, improved conventional-munitions version will be employed against personnel, materiel, and light armor. It will be the Army's first artillery projectile guided by a global positioning system.



these improvements into ERGM and Excalibur as appropriate. Subsequently, submunition efforts were put on hold since both programs shifted to a unitary payload.

In March 2000, a follow-on MOA was signed by the Army's Program Executive Officer for Ground Combat and Support Systems, Maj. Gen. John Michitsch (presently managed by PEO Am-

munition Brig. Gen. Paul Izzo), and the Navy's Program Executive Officer for Surface Strike, Rear Adm. Charles Hamilton. This MOA commissioned three tiers of cooperative management effort including:

- A flag-level Executive Steering Committee (ESC), which includes Army, Navy, and Strategic and Tactical Systems, Office of the Under Secretary of

*Hauser is the Program Manager for the U.S. Navy's Naval Surface Fire Support Program (PMS529) located at the Navy Yard in Washington, D.C. Grassano is the U.S. Army's Deputy Product Manager-Excalibur, located at Picatinny Arsenal, N.J.*

Defense (Acquisition, Technology and Logistics).

- An O-6 level Coordinating Integrated Product Team (CIPT), which includes both Services and Office of the Secretary of Defense (OSD) staff.
- Four Working Integrated Product Teams (WIPTs), which include management, technical, and warfighter representatives.

The four WIPTs are Requirements, Guidance/Navigation and Control (GNC), Lethality and Payload, and Business Case. These cross-Service WIPTs pursue initiatives including research and development, competition and pro-



curement strategies, and hardware/software/component and procedural commonality, with a goal of more affordable guided munitions.

The CIPT performs an oversight role for the WIPTs and reports status and issues to the ESC at least semi-annually. Upon execution of the March 2000 MOA, the CIPT immediately employed the OSD-staffed Tri-Service Software Evaluation

## CAPT. HERB HAUSE, USN

*Program Manager, Naval Surface Fire Support Program*



**C**apt. Herbert R. Hause, USN, is currently assigned as Major Program Manager for the Naval Surface Fire Support Systems (NSFS), PMS 529, within Program Executive Office (PEO) Surface Strike, a position to which he was assigned in February 2000. A graduate of the U.S. Naval Academy with a Bachelor of Science degree in General Management, Hause was commissioned as an Ensign in the United States Navy on June 5, 1974. He earned his Surface Warfare designation in 1976 and Acquisition Professional designation in 1994.

Hause served as a Surface Warfare Officer at sea in positions of increasing responsibility: Communications Officer, USS CONE (DD-866) (July 1974-February 1976); sequential billets as Combat Information Center Officer, Main Propulsion Assistant, and Engineer Officer, USS MITSCHER (DDG-35) (April 1976-June 1978); Assistant Material Officer, Commander Destroyer Squadron 2 (June 1978-June 1980); Weapons Officer, USS MCCLOY (FF-1038) (March 1981-October 1982); Operations Officer, Commander Destroyer Squadron 22 (January 1983-January 1985); Executive Officer, USS SAMUEL ELIOT MORISON (FFG-13) (September 1985-May 1987); and Commanding Officer, USS JESSE L. BROWN (FF-1089) (April 1991-January 1993).

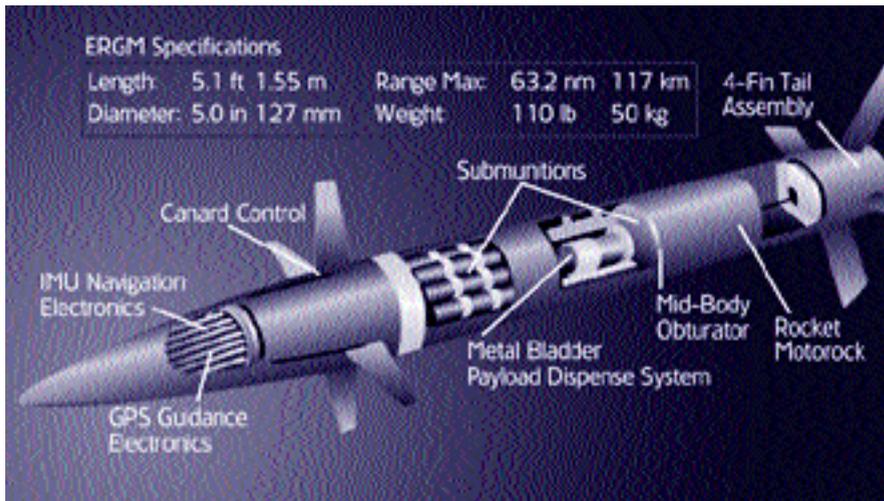
Hause's professional military training and education include Surface Warfare Officer Department Head School (June 1980-January 1981, Distinguished Graduate); Armed Forces Staff College (January 1985-June 1985); Surface Warfare Officer Executive Officer Course (June 1985-August 1985); Surface Warfare Officer Commanding Officer and Senior

Officer Ship Materiel Readiness Course (September 1990-January 1991, Honor Graduate); and Defense Systems Management College, Program Management Course (January 1993-June 1993) and Executive Course (October 1998).

Ashore, Hause served in the Operational Plans and Interoperability Directorate (J-7), Chairman of the Joint Chiefs of Staff from June 1987 to September 1990; the Naval Sea Systems Command from June 1993-August 1995 as Director, Surface Anti-Submarine Warfare Systems Division (SEA 91W4) and as Program Manager for Engineering Change 16 for the AN/SQS-53A Sonar. His program received the Vice President's "Heroes of Reinvention" Hammer Award in 1995.

From August 1995 until April 1998 he served as the Major Program Manager for Combat Systems Training Programs, PMS 430, within Program Executive Office for Carriers, Littoral Warfare and Auxiliary Ships. Major programs included the Battle Force Tactical Training System and Joint Simulation System (JSIMS) Maritime. From May 1998 to February 2000 Hause served as Deputy Program Executive Officer for Undersea Warfare.

Hause is married to the former Karen Dubac of Woodbridge, Virginia. They have four children: sons William, Thomas, and Matthew; and daughter, Jennifer. He and his family reside in Compton, Md.



The ERGM is a precision-guided munition that uses a coupled Global Positioning System (GPS) and Inertial Navigation System (INS) guidance system and aerodynamic flight control surfaces to steer the projectile to the pre-selected payload expel/dispense point. ERGM is designed to provide highly responsive precision engagement of threats to U.S. Marine Corps or U.S. Army ground combat forces operating ashore, prior to the establishment of organic fire support assets, and to supplement organic field artillery once it is ashore.

## CHRIS J. GRASSANO

*Deputy Product Manager, Excalibur*



Chris J. Grassano is currently the Deputy Product Manager, Excalibur, in the Project Manager's Office, Close Air Support, Armament, Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, N.J., a position to which he was assigned in September 1999. As Deputy Product Manager, he is responsible for engineering and technical management functions incident to development, integration, acquisition and fielding of Excalibur, an ACAT I weapon system that will be a family of modular precision-guided extended range artillery projectiles with three distinct payloads.

Grassano holds a Bachelor of Science in Electrical Engineering from New Jersey Institute of Technology; a Master's in Business Administration from Florida Institute of Technology; and a Master of Science in Management from Florida Institute of Technology. He has completed all programs on Leadership for Senior Executives at Harvard University; and is a graduate of the Advanced Program Management Course, Defense Systems Management College. Grassano is a Level III-certified acquisition professional in three acquisition career fields: Program Management; Test and Evaluation;

and Systems Planning, Research, Development and Engineering.

His career assignments include Staff Assistant to the Deputy Director, Land Warfare, Office of the Secretary of Defense (January 1999-September 1999); Department of the Army Systems Coordinator, Office of the Assistant Secretary of the Army, Headquarters, Department of the Army (HQDA), where he was HQDA Representative for the Deputy for Systems Acquisition (January 1998-January 1999); Project Management Engineer-Program Manager's Office, Seek And Destroy Armor (SADARM), U.S. Army ARDEC (June 1994-January 1998); and Project Engineer-Telemetry Branch, U.S. Army ARDEC (March 1986-June 1994).

Grassano received the Secretary of Defense Award for Excellence in 1999. He and his wife, Joann, have three children: Janna, Cara, and Krista.

Team to review software risk and reuse potential for Excalibur and ERGM. The CIPT tasked the WIPTs to conduct feasibility and cost-benefit analysis on the potential for common subsystems and all major components.

From this, a payoff vs. ease of implementation matrix was created that has guided future efforts for the WIPTs. The CIPT also established an ERGM/Excalibur Joint Risk Management Board, which strives to establish hardware/software/procedural commonality as feasible and jointly identifies and mitigates common risks.

### The Four WIPTs

The efforts of the four WIPTs are summarized in the following discussion.

#### REQUIREMENTS WIPT

The Requirements WIPT reviews operational requirements and projectile specifications, explores interoperability and interface requirements, and provides input to other WIPTs. This WIPT developed a Common Target Set to eliminate duplicate testing, and allows cross-Service use of test results. ERGM and Excalibur Operational Requirements Documents (ORD) were reviewed to identify areas of standardization, and this study has led to a standard approach to evaluate and document Target Location Error (TLE). The team is also reviewing ERGM and Excalibur security requirements in order to propose and implement a standard Security Classification Guide.

## GUIDANCE/NAVIGATION AND CONTROL WIPT

The Guidance/Navigation and Control WIPT facilitated extensive re-use of ERGM flight software that has resulted in a significant cost avoidance for Excalibur. It also monitors the development of the Navy's Low Cost Guided Electronics Unit (LCGEU) program, which has potential to meet guidance requirements for both ERGM and Excalibur in the future. Additionally, this WIPT pursues Global Positioning System (GPS), Inertial Measuring Unit (IMU), and anti-jam challenges and proposes common solutions. The team has also drafted common interfaces' specifications to allow interoperability of sub-systems and components.

## LETHALITY AND PAYLOAD WIPT

The Lethality and Payload WIPT developed a standardized explosive recommendation process to promote the use of common energetic materials for Army and Navy gun-fired munitions. This process recently facilitated the decision to use a common energetic fill for both the ERGM and Excalibur unitary warheads, which will lead to significant cost savings during production. Other cooperative efforts include:

- Standardized defeat criteria against standard target sets developed by the Requirements WIPT.
- Standardized arena performance test procedures for both unitary and submunition warheads.
- Standardized data analysis models for the calculation of lethal areas used to support Joint Munitions Effectiveness Manual (JMEM) revisions.
- Developing common payload fuzing for ERGM and Excalibur that will lead to reduced cost in production.

## BUSINESS CASE WIPT

The Business Case WIPT has developed Business Case models and tools to conduct cost-benefit analyses for component/sub-component commonality, and is developing strategies for future competitive procurement. They have also conducted Common Fill analyses (in conjunction with the Lethality and Payload WIPT) and determined cost ben-

efits to the programs. The WIPT is currently coordinating common Foreign Military Sales (FMS) policy for guided projectiles.

The most recent all-up round ERGM live-fire test of June 25, 2002, at White Sands Missile Range (WSMR) was a major milestone for Naval Surface Fire Support (NSFS) and all guided projectile programs. The ERGM round was fired at tactical launch pressure; all flight systems survived the 10,100 G (gravity force) gun launch and performed superbly. The round guided to the target 38.5 Nautical Miles down range (WSMR range constraints precluded longer range) to an accuracy of 4 meters.

Using the GPS/Inertial Navigation System for flight control and navigation,

ERGM successfully acquired the maximum number of satellites, thereby producing terminal accuracy well within ORD requirements. ERGM remains on track for full land-based testing starting in fiscal 2003, and Initial Operating Capability (IOC) in fiscal 2006.

The primary goal of the Army and Navy Guided Munition Commonality efforts remains to provide the most capable and affordable guided munitions to the warfighter. As such, this dual-Service commonality initiative and cooperative organizational structure may serve as a model for future acquisition programs.

Editor's Note: Hause and Grassano welcome comments on this article. Contact [Walmanjp@navsea.navy.mil](mailto:Walmanjp@navsea.navy.mil).

## New DAU Training Site Opens at TACOM



A ribbon cutting ceremony held on Aug. 13, 2002, officially opened the new DAU training site, located with the Army Tank-Automotive & Armaments Command in Warren, Mich. The new training site is an element of the DAU Midwest Region, which has its main campus at Wright-Patterson Air Force Base, in Dayton, Ohio. From left: Chris Paden, DAU TACOM Site Director; Army Col. Ronald Flom, DAU Commandant; Richard Bradley, Director, TACOM Learning Center; and Gerald Emke, Dean, DAU Midwest Region.

Photo by Margaret Compton

# Activity Based Costing Efforts

## Related to Advances in Total Ownership Cost Management for Aircraft Carriers

STEPHEN J. MORETTO

This article condenses and updates "Advances in Aircraft Carrier Life Cycle Cost Analysis for Acquisition and Ownership Decision Making," by Stephen J. Moretto and Irvin M. Chewning, published in the May 2000 *American Society of Naval Engineers Journal*.

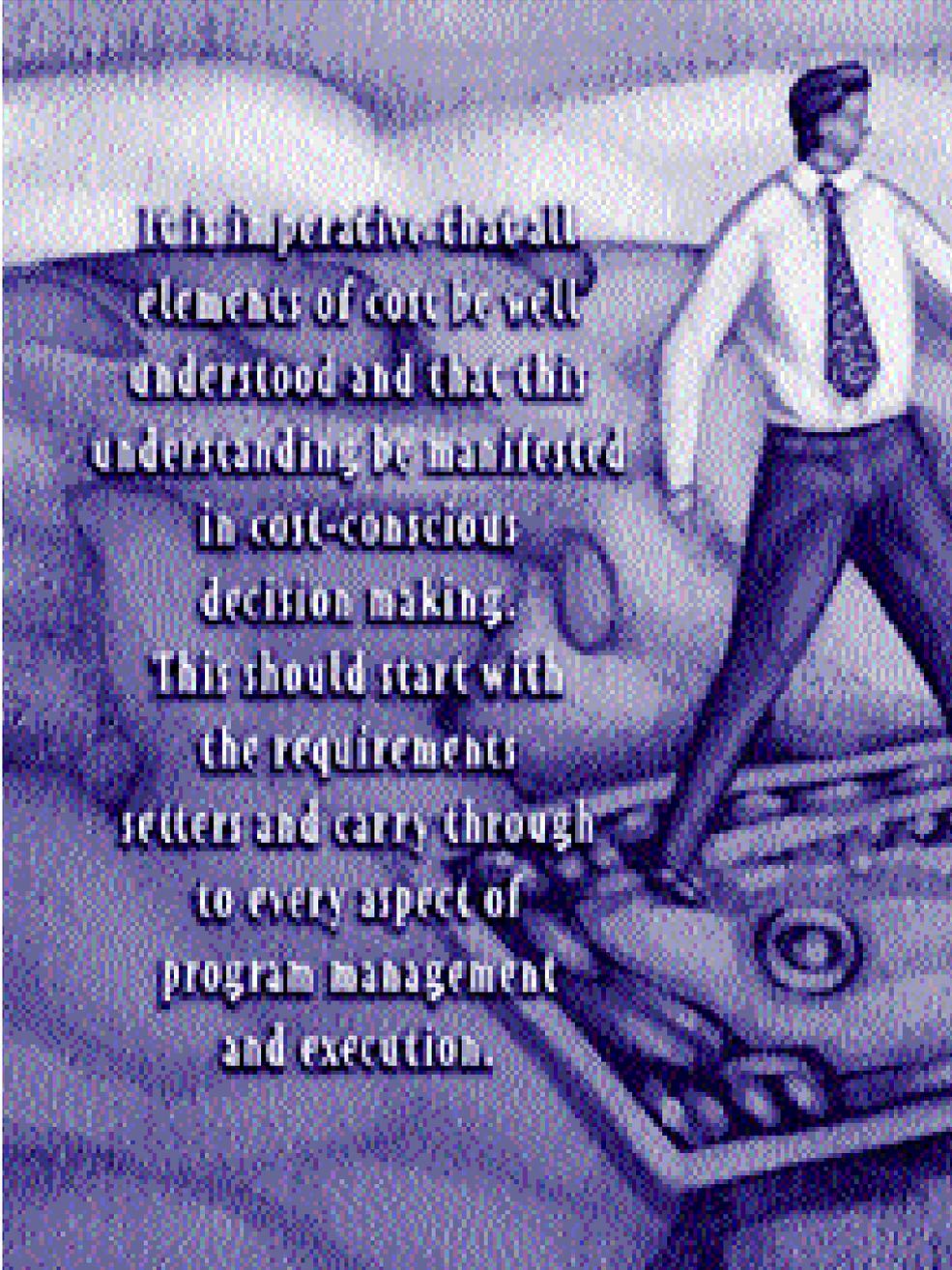
**T**he U.S. Navy recently conducted an Analysis of Alternatives (AOA) to set the stage for determining the characteristics and acquisition strategy for its next generation aircraft carrier. The platform design selected is expected to be in service throughout the 21<sup>st</sup> century. The issue of affordability is paramount as aging systems become more expensive to operate and maintain.

### Meaningful Information for Cost-Conscious Decision Making

This article focuses on the need for the program management office and its supporting cost analysis staff to understand the Total Ownership Cost (TOC) of the existing and proposed future aircraft carriers and to then translate this data into meaningful information for cost-con-

scious decision making. The challenge is to relate the cost in terms the key decision makers and the engineering team can use to satisfy their respective roles.

Thus, it is necessary to translate the results of the given ship design alternative TOC into the paradigms of the respective stakeholders:



It is imperative that all elements of cost be well understood and that this understanding be manifested in cost-conscious decision making. This should start with the requirements setters and carry through to every aspect of program management and execution.

*Moretto is the Deputy Director of the Center for Innovation in Ship Design, Naval Surface Warfare Center Carderock. Previously, he was the Aircraft Carrier Cost Engineering Process Team Leader, NAVSEA Cost Engineering and Industrial Analysis Division. Over the last six years he has served Aircraft Carrier programs by developing analysis supporting aircraft carrier technology selection and requirements determination. Moretto is a graduate of the State University of New York at Buffalo with a Bachelor of Science in Industrial Engineering. He also holds a Master's from Virginia Tech in Management Systems Engineering Administration and is a graduate of the Navy's cost analyst intern program. Moretto is a graduate of APMC 01-1, Defense Systems Management College.*

- Fleet User (operators of aircraft carriers)
- Ship Designers (translators of the fleet operator requirements)
- Program Sponsors (providers of the funding resources)
- Program Management Office, Shipbuilder and Supporting Industry (executors of the acquisition and construction of the ship)
- Navy and OSD decision makers (overscers of program execution).

This article also describes how the aircraft carrier TOC breakdown structure

was converted from traditional cost accounting format to a system or activity-based structure that supported the program manager's decisions through Milestone I. The structure has been used in the AOA as a tool to identify cost drivers in order to perform Cost As an Independent Variable (CAIV) analysis and develop its evolutionary approach to aircraft carrier design.

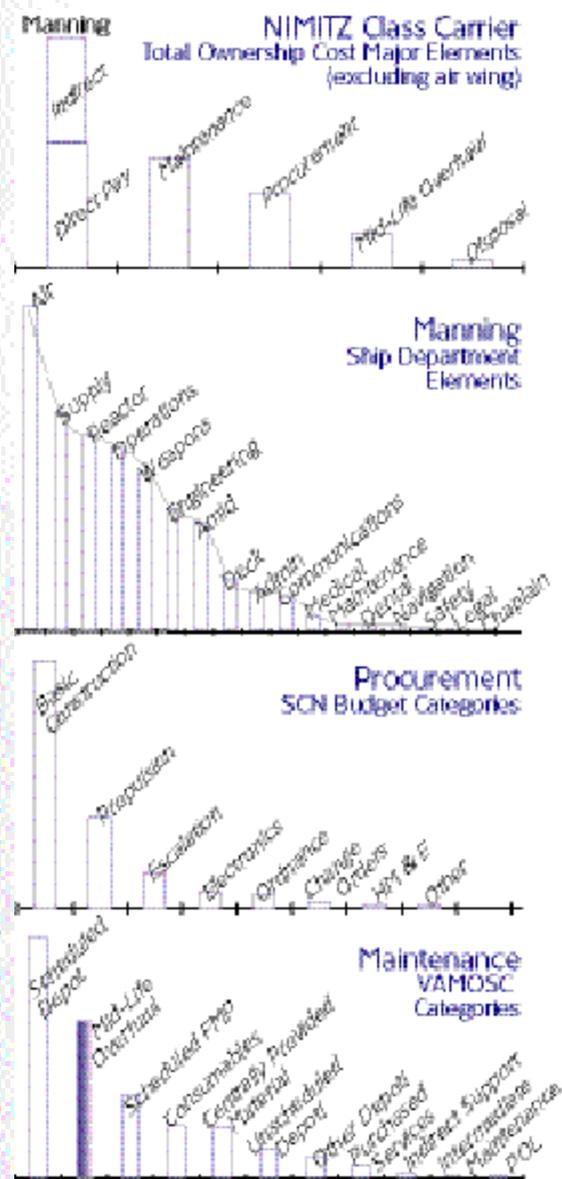
### ESWBS—Central Backbone of the Cost Work Breakdown

The Navy's Expanded Ship Work Breakdown Structure (ESWBS) has emerged

as the central backbone of the cost work breakdown for AOA work. The ESWBS structure is a natural choice as it is the framework within which the design and engineering community works. It provides the best framework from which to relate to program requirements, as it describes the ship-by-ship sub-system. The approach, for the first time, provides a breakdown of all life cycle cost elements by ESWBS. From this structure, it is possible to present costs in other formats for CAIV analysis, Cost Driver analysis, TOC management, design feature analysis, requirements analy-



**FIGURE 1. Traditional Aircraft Carrier Total Ownership Cost Major Element Breakdown**



sis, and Office of the Secretary of Defense (OSD) Cost Analysis Improvement Group (CAIG) Milestone Reviews.

## Inadequacy of Cost Accounting Format

Historically, the life cycle cost of weapon systems has been presented in a standard cost accounting format to satisfy program milestone requirements. Essentially the format was one-dimensional and provided cost data in a summary fashion with little insight into variables that drive cost, especially at the ship

sub-system or design feature level. Additionally, OSD requires that programs must establish TOC reduction goals, associated metrics, and processes to evaluate progress toward cost reductions. In order to do this, the program must determine what cost reductions are achievable and how they should be allocated. The problem is that this cannot be achieved using off the shelf accounting system data.

Due to decreasing budgets within the Department of Defense, new reporting

requirements have been put in place to increase program focus on cost reduction. Programs must develop TOC estimates for their systems and submit a TOC management plan.

In constant fiscal 2000 dollars, the TOC of a *Nimitz* Class carrier is estimated to be approximately \$28 billion. Figure 1 on p. 37 shows the hierarchical breakdown of the TOC by major cost elements. The breakout shows manpower, procurement, and maintenance costs. Further breakdown of these elements shows traditional cost accounting formats and gives engineers little information to make design and programmatic decisions.

## Developing a TOC Baseline

In order to understand the life cycle cost and the impact of design on affordability, a baseline TOC for the *Nimitz* class needed to be developed. The first step was to develop a TOC baseline that both the aircraft carrier program office engineers and upper management could use in making cost-based decisions. The initial problem to be overcome was that the Navy's database did not completely capture the data and did not present the data in a ship system format. Therefore, it was of limited use by those who were designing, managing, and overseeing the program.

To overcome this problem, a government-only team was formed to evaluate and compile databases into a total ownership cost estimate. The team determined that the ESWBS structure offered the greatest promise for a meaningful total TOC structure. After re-engineering the TOC structure for utility in the design, engineering, and decision-making process, the team recognized that it would need industry involvement in order to reach lower levels of detail it desired. Also, industry involvement was necessary to achieve buy-in, and institutionalize the TOC process within the aircraft carrier community. Therefore, a Navy/Industry Integrated Product Team (Figure 2) was formed and produced a baseline far surpassing the detail and content of those previously developed.

FIGURE 2. Government/Industry Integrated Product Cost Team

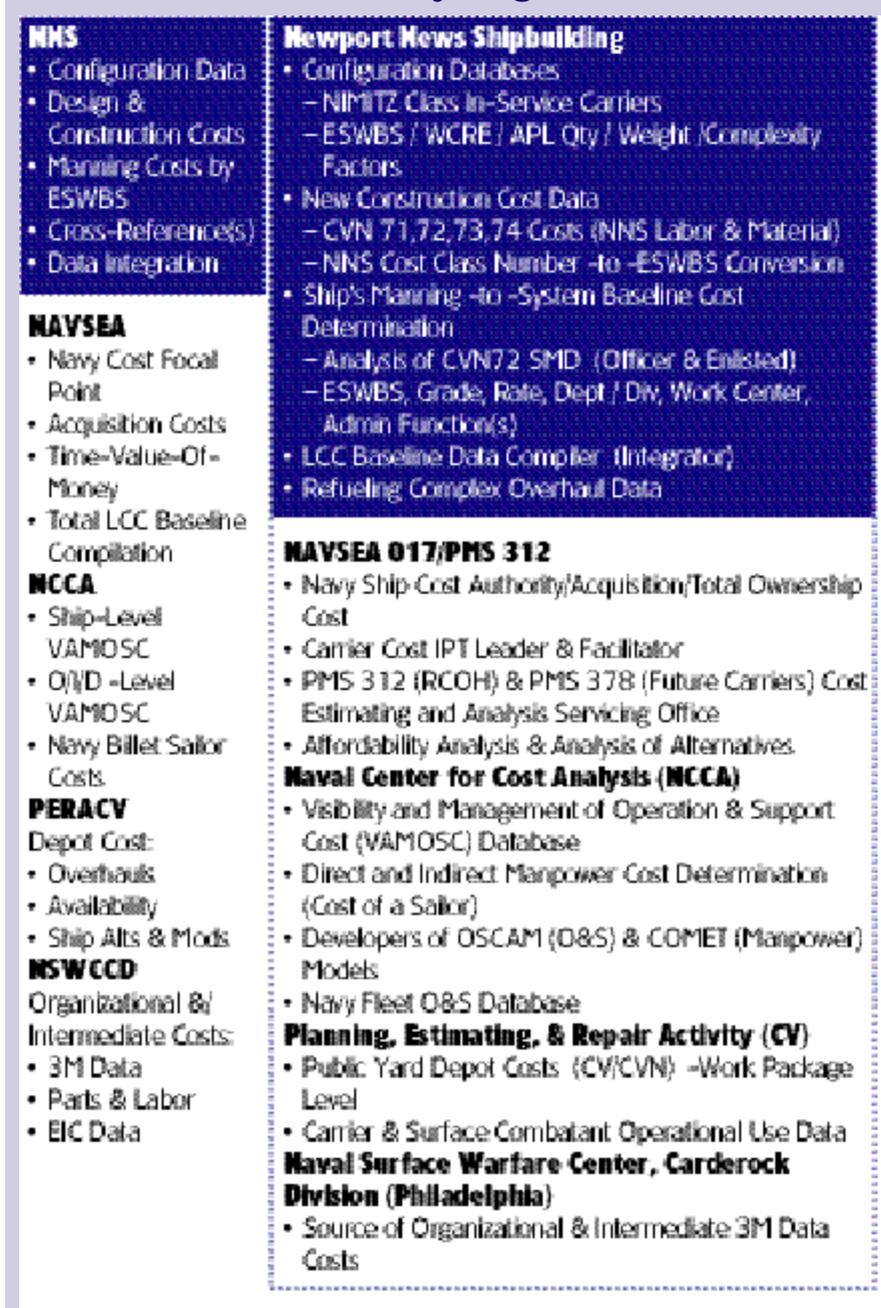
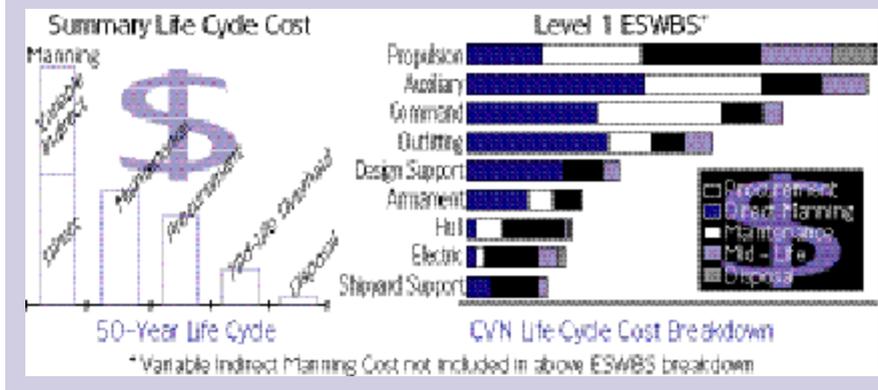


FIGURE 3. **TOC Balanced Scorecard**

<b>MOST IMPORTANT TOC MANAGEMENT PROCESS ATTRIBUTE(S)</b>	<b>“GENERAL” TACTIC(S) TO BE USED TO ACHIEVE TOC PROCESS ATTRIBUTE(S) SUCCESS</b>	<b>TOC PROCESS ATTRIBUTE(S) METRIC(S)/MEASUREMENT (HOW TO MEASURE SUCCESS)</b>	<b>“PHYSICAL” ACTION(S) TO BE TAKEN TO ACHIEVE TOC PROCESS ATTRIBUTE(S) SUCCESS</b>
<p><b>Affordability</b> TOC Process must be able to accomplish our objectives within the defined budgets</p>	<ul style="list-style-type: none"> <li>• Get Leadership’s Programmatic Buy-In and Funding</li> <li>• Simplify TOC Process</li> <li>• Identify TOC Baseline Costs/Reduction Objective(s)</li> <li>• TOC Accounting System</li> </ul>	<ul style="list-style-type: none"> <li>• Present vs. Future Projected Delta Dollar Estimations</li> <li>• Manpower/Billet Numbers Reductions</li> <li>• ROI Measurement</li> <li>• CAIV Cost Objective &amp; Threshold Measurement/Tracking</li> </ul>	<ul style="list-style-type: none"> <li>• Draw-Up Commitment Agreements</li> <li>• Establish Contractual Incentives</li> <li>• Standardize Cost Accounting Processes</li> <li>• Establish Ship-Specific TOC Baselines</li> <li>• Establish TOC Reduction Goals</li> <li>• Allocate Cost Reduction Goals to Teams</li> <li>• Use Competition to Reduce TOC</li> <li>• Eliminate Unnecessary Requirements</li> </ul>
<p><b>Accountability/Responsibility</b> Combines both accountability/responsibility and covers the TOC Process roles &amp; interactions (including duties and commitments) that must be embraced by all Stakeholders</p>	<ul style="list-style-type: none"> <li>• Establish TOC Organization</li> <li>• Assign TOC/CAIV Requirements to Individuals</li> <li>• TOC Education For All Carrier Player(s)</li> <li>• Publicize/Update TOC Goals, Objectives, &amp; Results</li> <li>• Publicize TOC Successes</li> </ul>	<ul style="list-style-type: none"> <li>• Organizational Chart Availability</li> <li>• Personnel/Responsibility Matrix</li> <li>• Necessary TOC Management Reporting Process In-Place &amp; Being Used</li> </ul>	<ul style="list-style-type: none"> <li>• Assign, Regulate, &amp; Hold People Accountable for TOC Action Items</li> <li>• TOC/CAIV Integrated into Performance Agreements</li> <li>• Define &amp; Provide Team Product Requirements/Cost Goals</li> <li>• Definition of TOC Team Decision Authority Levels/Limitations</li> <li>• Stated TOC Reporting/Deliverable Requirement(s)</li> </ul>
<p><b>Implementability</b> TOC Process must be simple enough to accomplish within the time, budget, and regulatory constraints of each program</p>	<ul style="list-style-type: none"> <li>• Establish/Empower the TOC Implementation Team to Make It Happen</li> <li>• Automated databases</li> <li>• Use the 80/20 rule</li> </ul>	<ul style="list-style-type: none"> <li>• TOC Management Plan Developed By 12/18/98</li> <li>• TOC Management Plan Approved For Implementation in 1999</li> <li>• Updates to Plan at Milestones and as Required</li> </ul>	<ul style="list-style-type: none"> <li>• Identify/Involve Stakeholders</li> <li>• Address Concerns &amp; Get Buy-In</li> <li>• Develop “Who Does What” TOC Program Accountability Matrix</li> <li>• TOC Implementation Schedule</li> <li>• Keep TOC Process Simple</li> <li>• Establish TOC/Design Guidelines</li> <li>• Allocate Carrier Team Member TOC Reduction Objective(s)</li> </ul>
<p><b>Measurability</b> TOC Process must establish indicators that are quantifiable/reproducible, &amp; track progress toward these goals</p>	<ul style="list-style-type: none"> <li>• Standard Carrier TOC Baseline</li> <li>• Standard TOC Equations</li> <li>• Standard Rules of Measurement (i.e. ROI Methodology)</li> </ul>	<ul style="list-style-type: none"> <li>• TOC Equations/Methods Are Reproducible (Dollars Add-Up The Same Every Time)</li> <li>• TOC IPT Quarterly or Yearly Accountability Score Card</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor TOC Goal(s) Achievement</li> <li>• Program Approved TOC Equations</li> <li>• Acceptable Acquisition/O&amp;S Costs Reduction Identification</li> <li>• Approved TOC Measurement Guideline(s) &amp; Metric(s) Document</li> </ul>
<p><b>Flexibility</b> TOC Process must have the ability to be adapted and incorporate change(s)</p>	<ul style="list-style-type: none"> <li>• Implement TOC Process Reviews</li> <li>• Utilize an Open TOC System Architecture</li> <li>• Keep TOC Process Simple / Simple Processes=Flexibility Are Easier To Adapt to Modifications</li> <li>• Assign TOC Process Ownership</li> </ul>	<ul style="list-style-type: none"> <li>• Time Required to Incorporate TOC Process Change(s)</li> <li>• Time Required to Close Open TOC Process Action Item(s)</li> <li>• TOC Process Review Frequency</li> <li>• Users Survey (Are Users Happy With Methodology?)</li> </ul>	<ul style="list-style-type: none"> <li>• Implement TOC Process Change Control (Where We’ve Been, Where We’re Going, &amp; Why)</li> <li>• Action Item Tracking/Status Monitoring List</li> <li>• Scheduled TOC Process Reviews</li> </ul>
<p><b>Believability</b> TOC Process must be credible/acceptable Buy-in from all the PEO Stakeholders</p>	<ul style="list-style-type: none"> <li>• TOC Buy-In: Conduct PEO Carrier Management Briefing(s)</li> <li>• TOC Open System Architecture That Allows For Verification and is Repeatable</li> <li>• Implementation Road map</li> <li>• TOC Procedure formalization</li> </ul>	<ul style="list-style-type: none"> <li>• TOC Process User Survey (Is It Working or Not)</li> <li>• Repeatable Result Check(s)</li> <li>• Carrier TOC Pilot Project Results (Check To Ensure That It Works On a Small Scale-First)</li> </ul>	<ul style="list-style-type: none"> <li>• Presentation to Senior Management</li> <li>• CVN LCC Baseline’s Letter of Validation by Component Cost Organization</li> <li>• TOC Process Develop Flowchart</li> <li>• Establish a TOC Pilot Program</li> <li>• TOC Web site-Latest Data, All the Time</li> </ul>
<p><b>Utility</b> TOC Process: accessible, user-friendly and useful in making TOC decisions.</p>	<ul style="list-style-type: none"> <li>• TOC Communication/Training</li> <li>• Provide TOC, CAIV &amp; ROI Tools and Software to Users</li> <li>• TOC Process Must Satisfy Whole Ship Integration Issue(s)</li> </ul>	<ul style="list-style-type: none"> <li>• TOC Process/Tools User Survey (Are They Working or Not)</li> </ul>	<ul style="list-style-type: none"> <li>• TOC Program Funding Identified/Provided</li> <li>• Published/Approved TOC Management Plan</li> <li>• Web site Real-time TOC Database</li> <li>• Web site Based TOC Tools</li> <li>• Provide TOC Training (Everyone)</li> </ul>

**FIGURE 4. TOC Process Attributes & Implementation Tactics, Metrics, and Action Plans**



**Application**

This work has significantly advanced the abilities of the Navy to address the cost details of aircraft carriers and provide the key information essential to manage the program, make cost-conscious decisions, and determine resource and technology investment strategies. The new approach enables a better understanding of the economic consequences of acquisition decisions and operational choices from a total life cycle cost perspective.

For the first time, we have established a methodology and database framework that identifies aircraft carrier cost drivers comprehensively, and establishes a life cycle framework for design trade-off analysis using CAIV. This tool will permit a clear focus on aircraft carrier ownership and cost-reduction initiatives, and provide a mechanism for continued process improvement toward a more affordable fleet.

This new database and methodology have been and are being used for the transition technology implementation, requirements setting, and AOA for future carrier planning. They constitute the key instrument in identifying and achieving cost reduction goals in aircraft carrier ownership. Figure 3 (preceding page) shows the balanced scorecard and methodology that formed the foundation for establishing the current PEO carrier TOC management process. This process can be an effective starting point for other programs and Ser-

vices in establishing an effective TOC management program.

**Lessons Learned**

The new comprehensive data structure facilitates a far more insightful view of the cost drivers underlying an aircraft carrier's TOC. Figure 4 shows how the traditional limited TOC breakdown can be decomposed into its subordinating elements and ranked from highest to lowest cost, by cost element. This allows one to identify (using the Pareto technique) the hierarchy of cost drivers within the ESWBS framework. The data are useful to ship designers and others, showing where the cost drivers are and, in turn, where to focus design efforts for maximum economic effect.

Similarly, the effects of systems or requirements changes can be readily assessed and compared to the baseline cost data to illustrate the cost effects. The data have been useful to both Navy

and Department of Defense management, helping to justify the Navy's Research and Development (R&D) investment strategy.

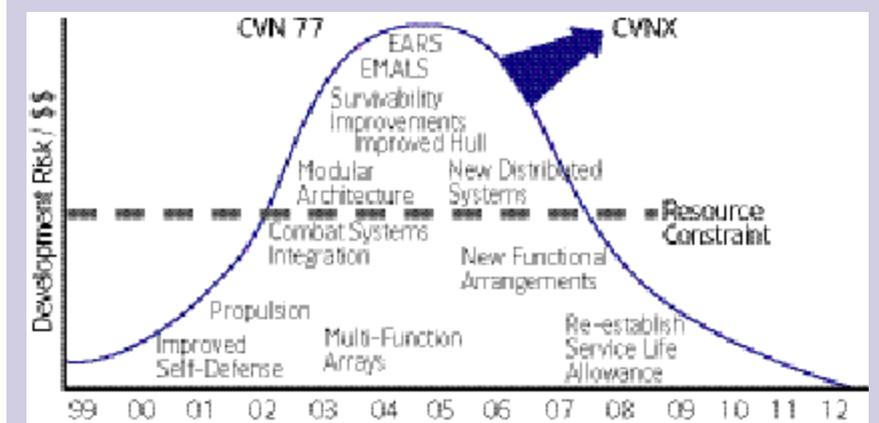
It makes sense to invest in the top cost drivers where the most significant cost reductions can be achieved. The aircraft carrier program, in fact, is pursuing this strategy. On CVNX1, the propulsion system is being replaced with a new design, which greatly reduces TOC, and enables follow-on technologies to be introduced as a result of increased electrical power capacity.

The aircraft launching system, which falls in the second highest cost driver ESWBS, *Auxiliary Systems*, is also being introduced on CVNX1. And, on CVN 77 a new warfare system is being introduced that falls into the third highest cost category, *Command and Control Systems*.

The system-level TOC analysis has served perhaps its most important function in providing the information used in arriving at the current aircraft carrier evolutionary strategy.

Initially the approach to the new class of carriers was a clean-sheet design (Figure 5), or a one-step approach to a new design where all changes from the baseline *Nimitz* class would be made in the initial ship of the CVNX class. Although the TOC clearly showed the greatest potential for TOC reduction across a class of aircraft carriers, the near-term affordability constraint carried the most

**FIGURE 5. Clean Sheet One-Step Approach is Unaffordable**



weight in the decision process. Clearly, there would be an overbearing up-front cost to be borne in the near-term Future Years Defense Plan (FYDP). The near-term timeframe was in this case the measure of greatest importance regarding the affordability issue.

As an alternative to the clean-sheet approach, an evolutionary strategy of gradual change to the *Nimitz* Class leading to the CVNX Class was proposed (Figure 6). The TOC estimates for this strategy also demonstrate significant TOC reductions that have been proven through investment metrics such as Net Present Value (NPV), and Return on Investment (ROI) analysis. This strategy permits the program to stay within the affordability constraints of the near-term FYDP while achieving large reductions in operating costs in the long-term. Figures 5 and 6 show how the CVNX program spread system development efforts over a three-step evolutionary approach.

### Understanding the Top System-Level TOC Drivers

Cost data should be translated to a WBS that captures the costs by major sub-systems for each TOC element. Cost requirements should also include a requirement for the baseline and alternatives to be presented in terms of sub-systems rather than in arbitrary cost accounting formats. This will enable engineers and managers to understand the top system-level TOC drivers in a complex weapon system. This understanding will result in better allocation of scarce program resources to the high-

impact drivers, and reduce allocation to areas that may have vocal support but are not drivers of cost.

Having the TOC data broken out by system will facilitate developing the program office's evolutionary acquisition approach through generating Pareto breakouts of system cost drivers. Using the CAIV process in choosing the best alternatives and supporting technologies, top system-level drivers would be identified and tackled first in an evolutionary strategy to have the most impact in making cost/performance trade-offs.

Reliable return cost data are needed to prepare TOC estimates. Contractor Cost Data Reporting requirements should require that contractors provide return costs of R&D and Development Contracts. Within the Navy, current techniques use bid data and top-level data as starting points to generate program non-recurring and procurement costs.

Better data would result in better program estimates at program inception, reducing program risk and cost. The system return cost WBS should break out subsystems at sufficient detail to support the designers', cost engineers', and managers' respective roles throughout the acquisition process. Reliable return cost would also enable better management and negotiation of future contracts.

### Renewed Interest in TOC Resulting in Improved Cost Analysis

Aircraft Carrier cost analysis has progressed dramatically over the past

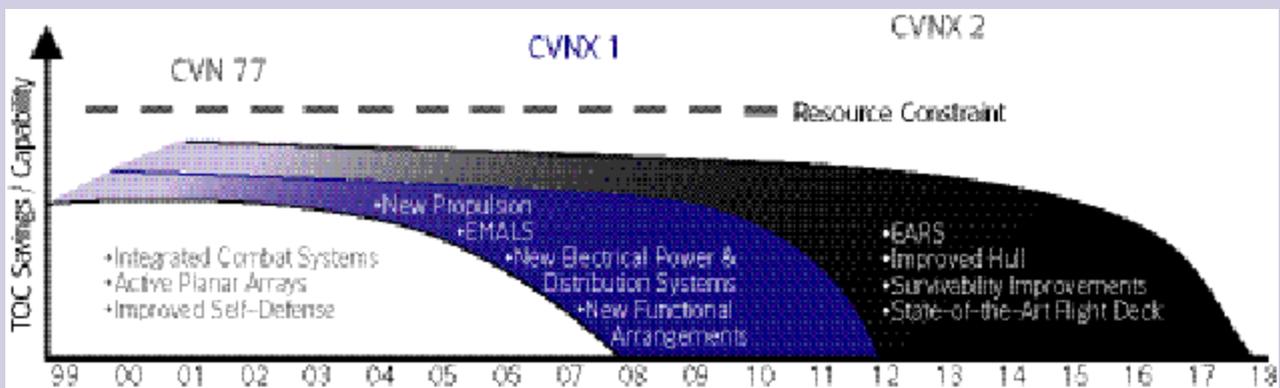
several years. This is the result of the renewed emphasis now placed on ownership cost reduction along with the realities of tight fiscal constraints. It is imperative that all elements of cost be well understood and that this understanding be manifested in cost-conscious decision making. This should start with the requirements setters and carry through to every aspect of program management and execution.

Moreover, advances in the relationship between the shipbuilder, the aircraft carrier program office, the engineering community, and the Naval Sea Systems Command cost analysis group working as a team have set the stage for continued improvement in our collective understanding and awareness of ship costs and program objectives. This affords maximum opportunity to leverage the collective knowledge and interests of the stakeholders toward a common objective.

A carefully thought out life cycle cost structure with supporting data is an invaluable tool in identifying cost drivers and providing essential information for investment alternatives. Timely, comprehensive, and meaningful life cycle cost information can enlighten the management of ship design, acquisition, construction, and ownership of naval warships.

Editor's Note: Moretto welcomes questions of comments on this article. Contact him at [morettosj@navsea.navy.mil](mailto:morettosj@navsea.navy.mil).

FIGURE 6. CVNX Evolutionary Concept



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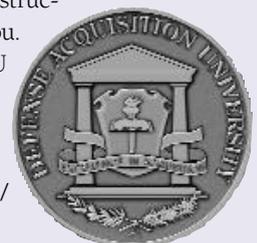
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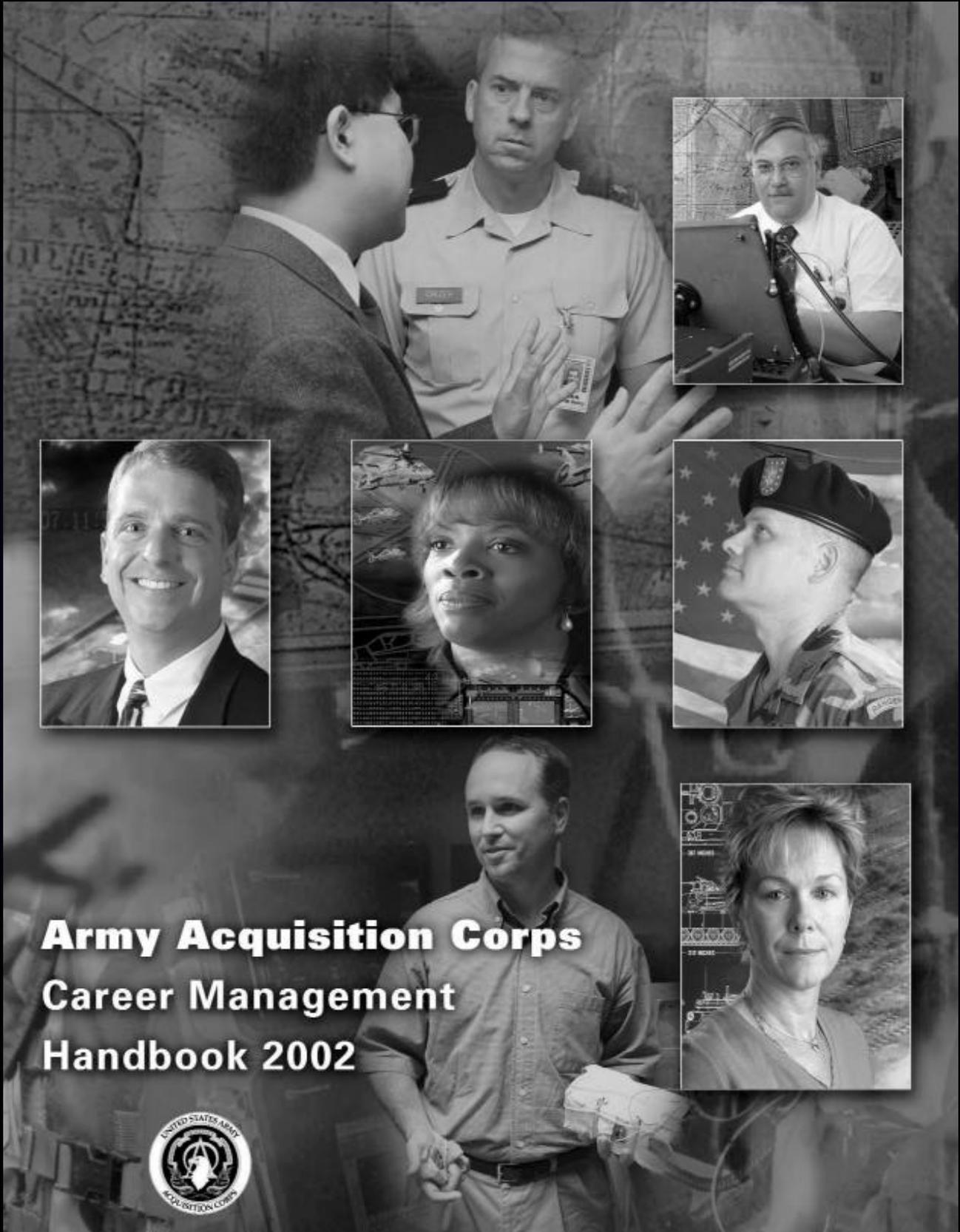


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# The Socratic Method

## Leveraging Questions to Increase Performance

MAJ. NORMAN H. PATNODE, USAF

**I**ncreasing performance means getting more of what you want, which of course assumes you indeed know what you want. If you can't put your vision for your organization into a story that excites and energizes your staff, then I recommend you explore Noel Tiche's concept of "The Teachable Point of View" in his book *The Leadership Engine*.

However, once you've got a story that captures the essence and energy of your vision, using the Socratic Method can help you quickly turn "your" story into "our" story and send the energy cascading through your organization. The Socratic Method is also a powerful way to help your staff discover how to turn that story into reality.

### Defining the Socratic Method

The Socratic Method is about moving people along—in a direction they want to go. It's not coercion, or manipulation—it's a means to help people see the world around them, and how they think about it, more clearly.

The "moving" is done by guiding and, when necessary, nudging people to examine those things they take for granted such as their assumptions, beliefs, experiences, and paradigms. The Socratic Method uses questions to challenge these things, to check their accuracy and their completeness. Through these questions the Socratic Method guides people on a journey of discovery, and moves

---

*Patnode is a Professor of Program Management and Leadership at the Defense Acquisition University, where he provides training in strategic leadership, critical thinking, teamwork and teambuilding, the application of Myers-Briggs (MBTI), program risk management, coaching, and conflict management. He also teaches a number of the basic program management tools.*

them toward greater understanding and increased performance.

Although leadership is about moving people, the simple truth is that nobody moves anywhere unless they move themselves. The Socratic Method is a way to help people see when they need to move, and where they need to move to. It produces better learning and better solutions because it leads people to explore, challenge their thinking, and discover answers for themselves. These discoveries make it easier for people to take action because they've figured out for themselves what needs to be done, and why.

### Putting the Socratic Method into Action

There are two elements essential to using the Socratic Method: 1) questions, and 2) knowing where we're going. We'll explore each in more detail.

### The Most Important Part—Staying Focused on Where You're Going

It's not enough to just ask questions. You must ask questions that move people toward a desired goal or end state. This is why the vision story is so important—it captures and communicates the desired outcome. Use your vision story to help you, and everyone in your organization, stay focused on where all of you are going.

When you're working one-on-one with individuals, think of yourself as a facilitator, where your role is to convey that



person to where he or she wants to go. If you're not sure where that is, ask. What's the desired outcome/end result? Then stay focused on helping the person to move there.

### **The Hardest Part: Figuring Out What Question to Ask (Next)**

Once it's been decided where you and your organization are going and why,

the next question is usually, how do we get there?

If this question draws nothing but blank stares, try flipping it around—tell me why we can't do this. This will produce a list of obstacles—a treasure trove of questioning opportunities.

- Why is this an obstacle?

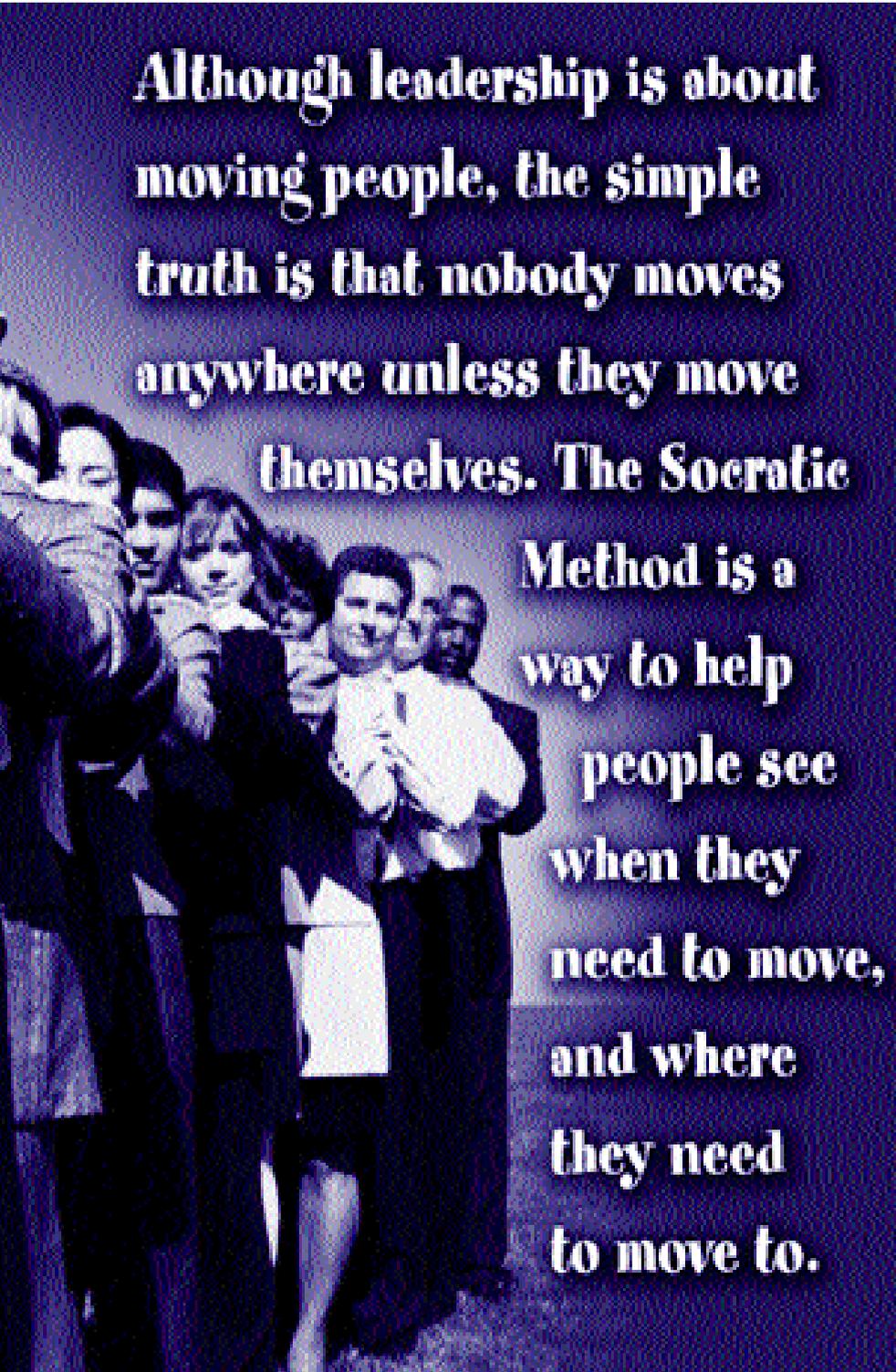
- Can we break it down into a set of smaller obstacles?
- What condition do we need to create to overcome this obstacle?
- What actions can we take to create this condition?
- Which do we need to do first?

Once you ask a question, be quiet. Wait. Even if there's a very loooooooong pause. Allow the person time to think and reflect, to form an answer. Don't answer your own question! You don't want to send the message that your questions are rhetorical. If someone is unable to answer your question, back up and break your question into smaller questions. Or you might ask the person what their question is—what's got that person stuck?

Your questions will likely elicit both statements and questions. Both contain valuable information, which you can use to help you determine the "needed next step." Knowing where the group (or individual) needs to go next, and how big a step that group (individual) is capable of taking will help you form the question that will move them forward.

To help you figure out the "next step," evaluate where they are on Bloom's Hierarchy of Learning (Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation). Are they asking basic "comprehension" questions about the facts, or are their questions about synthesizing the facts into some new application? If their questions are asking for facts and data, then responding with questions asking them to evaluate the implied concepts will probably move them backward, not forward. Use their questions to guide you in determining the level of your "response questions."

It's also helpful to understand the layers of complexity used to create information. In its simplest form, information is composed of concrete data and facts—things you can see and touch. With a firm grasp of the concrete things around us, we can then describe concepts such as trust, initiative, and commander's intent. And finally, when we



**Although leadership is about moving people, the simple truth is that nobody moves anywhere unless they move themselves. The Socratic Method is a way to help people see when they need to move, and where they need to move to.**

## Mike's Plan to Get on Contract



grasp a concept and are comfortable with it, we can use those concepts to describe big universal abstractions such as “visionary organization” or “democratic republic.”

Start with what you’ve just been given—the statement or question. What’s the level of complexity? Do you need to take that group (individual) up or down a level? Dropping down will allow you to help them clarify and build a strong foundation for moving back up. Stepping up an additional level allows you to challenge them mentally, to stretch their thinking. Be conscious of your choice and stay focused on where you’re going.

As you’re looking at the goal—where you want to go—ask yourself what’s needed to take the next step forward. If you’re working with a statement, ask what’s missing. Or if you were given a question, ask what’s needed to answer that question. What you’re doing is

using Socratic questions on yourself to help you find the next step forward. Then, once you find what’s needed, you have to figure out how to help them find it as well.

Sometimes, “finding” something is actually an exercise in recalling something—of pulling it into conscious thought. Other times the group (individual) will have to do some research, or you may have to do some teaching. At any rate, once you know what’s needed, form the question that will move them there.

Now you’re ready to respond to the initial statement or question—with a question that will help them move forward, toward where they want to go. Note that moving forward may mean stepping sideways, or even backward, as you ask questions to help them find what they need to answer their earlier questions. Because you don’t know before you start what they’ll need, you

can’t know in advance what path you and they will take as you guide them to where they want to go.

This can seem quite “messy”; however, with practice you’ll find the approach both fun and rewarding. After all, when do you learn best—when someone tells you the answer, or when they help you figure it out for yourself?

### An Example—Getting on Contract by Jan. 30

Let’s join the Program Manager (PM), Kevin as he meets with his Contracting Officer (KO), Mike, to discuss how they’re going to meet their short schedule to get on contract.

**PM**

*Mike, thanks for coming by. Let’s see what you’ve put together.*

**KO**

[Hands his plan to Kevin—see chart to the left.]

**PM**

[After studying the plan for a few moments, asks] *What was the date we said we needed to be on contract?*

**KO**

January 30

**PM**

*You remember why we said we needed to be on contract by 30 January?*

**KO**

Yeah. It was driven by the customers’ IOC [Initial Operating Capability]—they were hard over on that date. I don’t think we’ll get them to change it.

**PM**

*So, will this plan get us on contract by 30 January?* [Kevin’s first objective is to reach a clear understanding and agreement of “where we need to go.”]

**KO**

No, it doesn’t show us getting on contract until 15 March, and I’m not confident we’ll actually be on contract before April Fool’s day.

**PM**

Well, we promised our customers we'd meet their IOC date, so let's see if we can find a way to keep from becoming the subject of their April Fool's jokes. Let's start with the plan you've mapped out. You have any ideas on how to shorten it? [At this point, Kevin is prepared to be quiet and wait. It may take Mike some time to think before he answers.]

**KO**

Well, I wish I could get the engineers to give me a SOW [Statement of Work] right now, but I know from past experience I won't see one for another 2½ months. [The key here is to explore "past experience," so Kevin asks "why."]

**PM**

Why's it take them 2½ months to write a SOW for this effort? Isn't it pretty straightforward?

**KO**

It is, but it's not the only thing on their plate. In fact I don't think it's even their number one priority.

**PM**

O.K. what if I made it clear to them, and their boss, that this is their number one priority, and they're not to work on anything else until they're done. Given that, how long do you think it would take them to write a SOW?

**KO**

I'd guess they could knock it out in two to three weeks.

**PM**

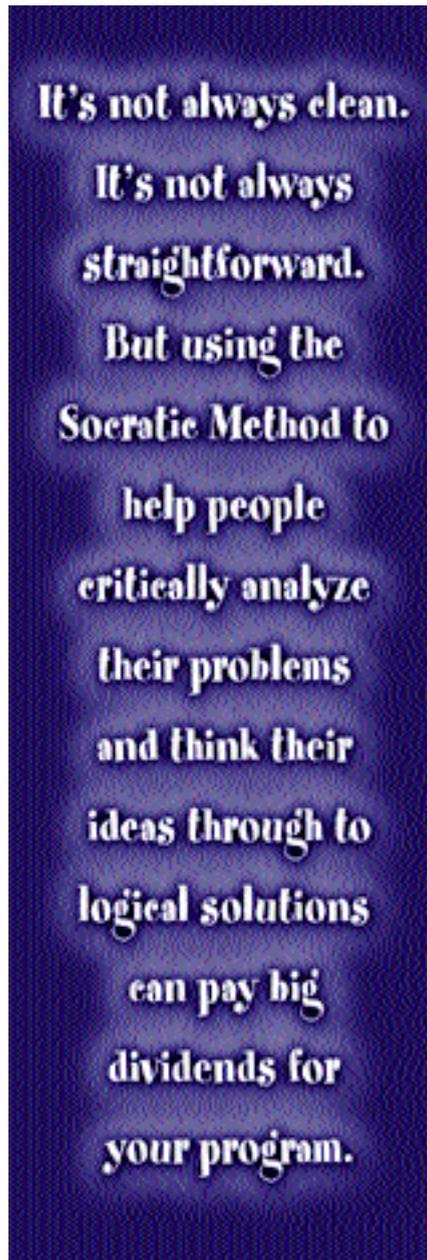
Do you have to wait until they're done to start writing the draft solicitation? [Seeing that Mike's plan shows "Develop SOW" must be done before "Create Draft Solicitation," Kevin challenges Mike on this assumption.]

**KO**

Actually, no. I could get a lot of it done before I have a complete SOW.

**PM**

O.K. Here's an off-the-wall question. Do we even need to write a SOW? [Kevin decides to step up a level and challenge



Mike's paradigm of the process. At this point Kevin is checking, instigating an exploration—he doesn't know if the assumptions in Mike's paradigm are valid or not. His intent is to cause Mike to check those assumptions.]

**KO**

Huh? How will the contractor know what we want them to do if we don't give them a SOW?

**PM**

What if we give them a SOO [Statement of Objectives], and ask them to give us a detailed SOW as part of their proposal? Could we do that?

**KO**

Well, yes. It's been done before, and it works fine. If we took that approach, it would let us get the proposal out sooner.

**PM**

Do our engineers know how to write a SOO?

**KO**

It's not hard, but I'm not sure they've done it before. Since we've already decided to put them on this full time, why don't you have Laurie, Tom, and Ed work directly with me and I'll help them knock this out.

**PM**

So how long do you think it will take before we're ready to release a draft solicitation? [Kevin's intent is to move them toward where they agreed they need to go.]

**KO**

Well, if the four of us work together, and focus on this single task, I don't see it taking us more than three weeks.

**PM**

So we've just gone from 12 weeks to release a draft solicitation to three—is this really doable? [Again, Kevin is asking Mike to check the assumptions they've just made.]

**KO**

Kevin, if you can give me Laurie, Tom, and Ed full time, we can make this happen.

**PM**

Great! That gives us a plan that not only meets our contract award date, but gives us a week's buffer as well. Well done, Mike. You've done it again.

Notice how the Program Manager guided his Contracting Officer to a solution to the problem. First, Kevin clarified where they needed to go, and reviewed why it was important to get there. Next he asked Mike for his ideas, which relaxed Mike, got him talking, and helped them move forward together. With each question, Kevin moved Mike forward by helping him uncover what

was blocking them. Kevin's questions also helped Mike uncover his assumptions, which helped him to generate new options.

It's not always clean. It's not always straightforward. But using the Socratic Method to help people critically analyze their problems and think their ideas through to logical solutions can pay big dividends for your program.

Remember, as you lead people along with questions, not everyone will take the same steps—partly because they're not starting at the same place, but also because people learn in different ways.

Respect that, and ask your questions in a way that helps them move forward. Be open and join them on their journey of discovery. This is far more effective than trying to drag them along the path you'd take.

### **Make a Commitment to Use the Socratic Method**

Why use the Socratic Method instead of just telling your people what to do or directing them? When you have a tough challenge, an intriguing puzzle, what's your reaction when someone walks up and tells you the answer? Anger? Frustration? Perhaps you feel like you've been robbed.

Indeed, "giving" someone the answer to a problem or question is robbing them—robbing them of valuable learning opportunities, because in each of us learning happens fastest when we figure things out for ourselves. And when we figure something out for ourselves, we're energized to go make it happen. So make a commitment to yourself not to rob people of the joy and energy of discovery, but rather to help them move forward by asking Socratic questions.

Editor's Note: The author welcomes questions or comments on this article. Contact him at [norman.patnode@dau.mil](mailto:norman.patnode@dau.mil).

## **Defense Acquisition University and Lockheed Martin Corporation Form Strategic Partnership**

**O**n Nov. 4, 2002, Defense Acquisition University (DAU) President Frank Anderson Jr., and Dr. Malcolm N. O'Neil, Chief Technical Officer, Lockheed Martin (LM) Corporation, signed a Memorandum of Understanding (MOU) to work closely with each other in the development of joint training curricula that would provide better tools,

techniques, and materials to both Defense industry and government personnel.

The goal of this cooperative relationship is to improve program performance by enhancing knowledge, understanding, and transparency of the government and contractor roles in systems acquisition.

The opportunities for partnering include, but are not limited to, collaboration and coordination on numerous subjects including:

- Revisions to the aerospace and defense addendum to the Project Management Body of Knowledge.
- Lean learning practices.
- PM Toolkits and the digital environment.
- Knowledge management communities of practice.
- Risk management tools, including Independent Nonadvocate Reviews and Independent Cost Estimates.
- Transition phase (proposal to performance).
- Program failure analysis.
- Systems engineering.
- Subcontract management.
- Earned value management.
- Mutual development of case studies in program management.

This MOU contemplates a joint effort between DAU and LM that focuses on lessons learned (both government and industry), elements of success, and best practices.



From left: Dr. Malcolm N. O'Neil, Chief Technical Officer, Lockheed Martin Corporation, and Frank Anderson Jr., DAU President.

Photo by Army Sgt. Kevin Moses

# Defense Acquisition University and Stevens Institute of Technology Form Strategic Partnership

Continuing its goal of advancing educational opportunities, DAU and the Stevens Institute of Technology (SIT) established an educational strategic partnership by signing a Memorandum of Understanding (MOU) at the Pentagon, Oct. 15, 2002. Signatories of the MOU were Frank Anderson Jr., President, DAU; Harold J. Raveché, President, Stevens Institute of Technology; Louis A. Kratz, Assistant Deputy Under Secretary of Defense (Logistics Plans and Programs), Office of the Secretary of Defense; and Donna S. Richbourg, Principal Deputy Director, Defense Acquisition and Procurement Policy.

The establishment of this strategic partnership is to offer enhanced opportunities for members of the DoD Acquisition, Technology and Logistics (AT&L) workforce to participate in the Graduate Certificate Programs in Systems and Supportability Engineering and the Master's Degree in Systems Engineering under the System Design and Operational Effectiveness (SDOE) Program.

The opportunities identified in the memorandum include but are not limited to the following terms and conditions:

- SIT will utilize the education, training, and experiences of the members of the Defense AT&L workforce received in pursuit of DAU-level certification in at least one of the Defense Acquisition Workforce Improvement Act (DAWIA) career fields in conjunction with a Graduate Certificate in Systems and Supportability Engineering and the Masters Degree in Systems Engineering under the SDOE Program offered by SIT.
- SIT will provide administrative support services, including counseling and assisting students desiring to enter the program.
- SIT will promote and advertise the programs throughout the Defense AT&L workforce.
- SIT will provide DAU with information, as required, for planning, conducting, and reporting of DAU operations.
- SIT will provide qualified and experienced instructors to conduct the courses.
- DAU will assist with outreach and communications in promoting the certificate and degree programs; advise students; and provide SIT with suggestions for adjusting content of academic courses to meet the changing needs of

the programs and Defense AT&L workforce educational requirements.

- DAU will provide copies of student transcripts for DAU courses.

DAU is consistently involved with upgrading the Acquisition Logistics curriculum and program structure to address the evolving educational requirements of the DoD workforce while also establishing DAU as a formative lean enterprise institution. SIT developed the SDOE Program to respond to DoD and Defense industry's requirements for graduate education in systems and supportability engineering. Through this common purpose and objectives, DAU and the SDOE Program at SIT will actively collaborate on curriculum development in the form of case studies, lessons learned, best practices, and metrics and measures for system supportability and logistics. DAU and the SDOE Program at SIT will also develop research topics and projects in the area of Acquisition Logistics.

For more information about this partnership, contact Wayne Glass, Director for Strategic Partnerships, Strategic Planning, Action Group, at [Wayne.Glass@dau.mil](mailto:Wayne.Glass@dau.mil).



From left: Donna S. Richbourg, Principal Deputy Director, Defense Procurement and Acquisition Policy; Louis A. Kratz, Assistant Deputy Under Secretary of Defense (Logistics Plans and Programs), Office of the Secretary of Defense; Harold J. Raveché, President, Stevens Institute of Technology; and Frank Anderson Jr., President, DAU.

Photo by Army Sgt. Kevin Moses

## DAU and Defense Institute of Security Assistance Management Sign Letter of Intent

**O**n Monday, Nov. 4, 2002, Frank J. Anderson Jr., President, Defense Acquisition University, and Ronald H. Reynolds, Commandant of the Defense Institute of Security Assistance Management (DISAM) signed a Letter of Intent (LOI). The LOI is a foundation for the establishment of an International Community of Practice and Strategic Partnership between DAU and DISAM.

The ultimate goal is to create continuous learning opportunities for DoD AT&L workforce members and the security assistance management community to increase their knowledge, skills, and abilities.

For more information about the DAU-DISAM partnership, contact Wayne Glass, Director for Strategic Partnerships, Strategic Planning Action group, at [Wayne.Glass@dau.mil](mailto:Wayne.Glass@dau.mil).



Ronald H. Reynolds (left), Commandant of the Defense Institute of Security Assistance Management; and Frank J. Anderson Jr., DAU President, sign a Letter of Intent, Nov. 4, 2002, to establish a strategic partnership.

Photo by Richard Mattox

## Defense Acquisition University and Strayer University Sign Memorandum of Understanding

**I**n efforts to extend its educational strategic partnerships and leverage learning opportunities, the Defense Acquisition University (DAU) signed a Memorandum of Understanding (MOU) with Strayer University during a ceremony held at DAU Headquarters, Fort Belvoir, Va., Oct. 24. Signatories of the MOU were Frank Anderson Jr., President, DAU, and Donald R. Stoddard, President, Strayer University.

The signing of the MOU establishes a strategic partnership leading to providing educational opportunities for currently enrolled and potential students of both institutions. This agreement is designed to facilitate the transfer of DAU course

credits that have been certified by the American Council on Education (ACE) toward Strayer University degree or certificate programs.

This strategic partnership provides an important opportunity to meet acquisition education goals and increase the skills, knowledge, and abilities of the DoD AT&L workforce.

For more information about this partnership contact Wayne Glass, Director for Strategic Partnerships, Strategic Action Group, at [Wayne.Glass@dau.mil](mailto:Wayne.Glass@dau.mil). For more information on the degree programs offered by Strayer University, go to <http://www.strayer.edu>.

Donald R. Stoddard (seated left), President, Strayer University, and Frank Anderson Jr., President, Defense Acquisition University, sign a Memorandum of Understanding on Oct. 24, 2002, formalizing a strategic partnership to pursue educational opportunities. Standing from left: Lisa Johnson, Office of the DAU Provost; Wayne Glass, Director for Strategic Partnerships, Strategic Planning Action Group, DAU; Dr. Chris Toe, Provost, Strayer University; Pam Bell, Associate Dean and Director of Strayer Online; Tina Richards, Office of the DAU Provost; Dr. Bob Ainsley, DAU Acting Provost; and Tim Shannon, Dean, DAU Capital and Northeast Region.

Photo by Richard Mattox



# P M

**P**rogram Manager Magazine is the ideal forum for publishing your next article on acquisition and logistics excellence, acquisition legislation, or acquisition current policies and practices. You are the subject matter experts—send us your successes, failures, lessons learned, or long-range vision for what may or may not work and why. In the process, gain peer exposure and recognition as a subject matter expert in your field. We want to hear from you and your associates—**today**.

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## WHAT

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## WHEN: NOW



# CALL FOR AUTHORS

For submission guidelines, contact the editor (703) 805-2892 or visit our Web site at <http://www.dau.mil/pubs/pm/articles.asp>

# The Trouble with Action Items

## Make it Simple—Keep it Simple

DON PAUL RANCE • CAPT. DAN WARD, USAF

### AI-TREK— "The Trouble with AIs" episode



In the classic Star Trek episode entitled, "The Trouble With Tribbles," the Enterprise is overrun with rapidly multiplying little fur balls. The creatures seem pleasantly benign, but Dr. McCoy quickly discovers that 50 percent of their metabolism is geared toward reproduction. Their ex-

pansive population growth threatens to overwhelm the ship's resources, and the crew spends much of the episode trying to get rid of the pets-turned-pests.

#### Action Item Guidelines

In many program offices, Action Items (AIs) play a similar role. They seem be-

nign, even useful, but they have a tendency to multiply and linger, drawing more resources than necessary or appropriate. The Information Dissemination Services-Direct Delivery (IDS-D) Program Office at the National Imagery and Mapping Agency developed the following guidelines for managing AIs.

*Rance is Program Manager for the next generation Imagery Dissemination System-Direct Delivery (IDS-D) at National Imagery and Mapping Agency (NIMA), Reston, Va. He is Level III-certified in Program Management. Ward is the Technical Team Lead for IDS-D at NIMA, Reston, Va. He is Level I-certified in Test and Evaluation and in Program Management, and Level III-certified in Systems Planning, Research, Development, and Engineering.*

### Guideline No. 1

First, develop a database for AIs if one does not already exist. Then, periodically clean it up. If AIs are old and over-come by events, delete them. Continuing to carry old actions is a sign of a program going (or gone) "south"—indicating the existence of either tough problems that no one is stepping up to solve, or a general apathy about whether or not assigned actions are completed.

### Guideline No. 2

Be judicious in accepting responsibility for AIs. It is often appropriate to simply pass along an action to another person, office, or organization and be done with it. This is especially true of actions that can be resolved as a matter of normal business. Ask the question, "Do we really need a formal action item to accomplish this?" In addition, just because someone asks a question doesn't mean you have to give an answer. Often, questions come up that other organizations should answer in other forums. Smart action officers resist the urge to get involved in this type of activity.

### Guideline No. 3

Enforce due dates and personal accountability. The AI database custodian should remind all AI responders of upcoming due dates. It is generally not enough to say, "Ensign Chekov, AI #579 is due next week." The reminder should include enough information for the responder to understand exactly what action is required—maybe even a copy of

the original action. The AI responders should be expected to provide AI status before the meeting in which AI status is reviewed. Extensions of the due dates can be granted, but should only be considered prior to the status meeting. Asking for an extension at a meeting often sounds like: "Sorry, I have not taken the time to look at my responsibilities ahead of time, so now that I'm finally getting around to it, can I have more time... (not to do anything)?" We should not let our folks get into this situation.

### Guideline No. 4

Real-time AI closure is possible in some situations. For example, if Sulu has an AI to send a report to Capt. Kirk, his report should include a line that states: "This closes AI #823." The originator of the AI should be notified, and there should be an opportunity for the originator to come back and say: "No, that didn't answer the mail"—we don't need several layers of review to confirm that the message was sent.

### Guideline No. 5

When an action is complete, sometimes it is the end of the story. Most closed actions do not need to be briefed to the entire Directorate, Wing, or Agency. The closure action should be well coordinated and agreed to by the AI's originator, but most of the time closing an action should be a straightforward matter of one or two individuals making a

judgment that a particular task is complete.

### Guideline No. 6

Unless an action item closure plan calls for a technical briefing, technical discussion surrounding the action should be tightly controlled. After all, the action was assigned to someone to go off and act.

### Guideline No. 7

Finally, use technology where you can to maximize efficiency. Microsoft Access, or a similar tool readily available to most of us, is a good way of tracking actions. These tools also make it simple to e-mail AIs as part of the coordination/closure process.

### Bottom Line

All AIs are not created equal. Everyone involved in the creation, management, and closure of AIs needs to use individual judgment and avoid treating each AI the same. Track the ones that need tracking; brief the ones that need briefing; and when an action is closed—mark it closed. Handle them with care and your program office won't be overrun by resource devouring, low value-added AIs. If they do get out of hand, you can always do what Scotty did—*transport them to a Klingon ship.*

Editor's Note: The authors welcome questions or comments on this article. Contact them at [ranced@nima.mil](mailto:ranced@nima.mil) or [WardD@nima.mil](mailto:WardD@nima.mil).

## RAYTHEON BECOMES DAUAA'S FIRST CORPORATE SPONSOR

Defense Acquisition University Alumni Association (DAUAA) President Frank Varacalli (second from right) accepts a \$2,500 sponsorship check on behalf of DAUAA from Raytheon, DAUAA's first corporate sponsor. The presentation was made during the 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 attending the presentation were Frank Swofford (left), Defense Acquisition University Industry Chair; and Bill Bahnmaier (right), Vice President for Membership, DAUAA.

Photo by Army Sgt. Kevin Moses





## Value Engineering Achievement Awards for 2002

**P**rincipal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics Mike Wynne and Principal Deputy Director, Defense [Strategic and Tactical] Systems Spiros Pallas today presented the annual Department of Defense Value Engineering Achievement Awards at a ceremony held at the Program Executive Officers/Systems Command Commanders' Conference at Fort Belvoir, Va.

Value engineering is a systematic process to analyze functions in hopes of identifying ways to reduce the production or operations cost of systems, equipment, facilities, services, or supplies with the objective to reduce total cost of ownership while retaining required system performance and quality. During fiscal 2001, more than 2,100 in-house Value Engineering Proposals and contractor-initiated value engineering change proposals were accepted with projected savings in excess of \$768 million.

The Value Engineering Awards Program is an acknowledgment of exemplary achievements and encourages additional projects to improve in-house and contractor productivity. An award winner from each DoD component was eligible for selection in the following four categories: (1) program/project, (2) individual/team, (3) organization, and (4) contractor. Additional special awards were given to recognize innovative applications or approaches that expanded the traditional scope of value engineering use.

The awardees during today's ceremony were:

### ARMY

Program/Project—Col. James C. Naudain, Precision Fires Rocket and Missile Systems Project Management Office

Individual—Kerry E. Walker, U.S. Army Corps of Engineers

Organization—U.S. Army Soldier and Biological Chemical Command

Contractor—Raytheon Company and Program Management Team for Tactical Radios Communications Systems

Special—Mississippi Valley Division, U.S. Army Corps of Engineers

Special—Gregory P. Zelnio, U.S. Army Operations Support Command

### NAVY

Program/Project—Value Engineering in Legacy Systems Support Team

Team—NAVAIR Fleet Area Control and Surveillance Facility Display Console Integrated Product Team Organization—Atlantic Division, Naval Facilities Engineering Command, Value Engineering Office Contractor—HBA Architecture Engineering and Interior Design

### AIR FORCE

Program/Project—Electronic Systems Center's Space and Nuclear Deterrence C2 Office, Hanscom Air Force Base, Mass., and Contractor, Logistics Support Facility of JAYCOR

Individual—Bruce Lehr, Hill Air Force Base, Utah Organization—746<sup>th</sup> Test Squadron Team, Holloman Air Force Base, N.M.

### DEFENSE LOGISTICS AGENCY

Program/Project—Non-Metallic Bushing Sleeve Team, Defense Supply Center Richmond Individual—Francis Belill, Defense Supply Center Columbus Organization Defense Supply Center Richmond

Special—Carmen J. Viola, Defense Supply Center Philadelphia

Special—Robert Schaffer, Defense Supply Center Richmond

### MISSILE DEFENSE AGENCY

Program/Project—Lower Tier and Missile Defense Project Management Office

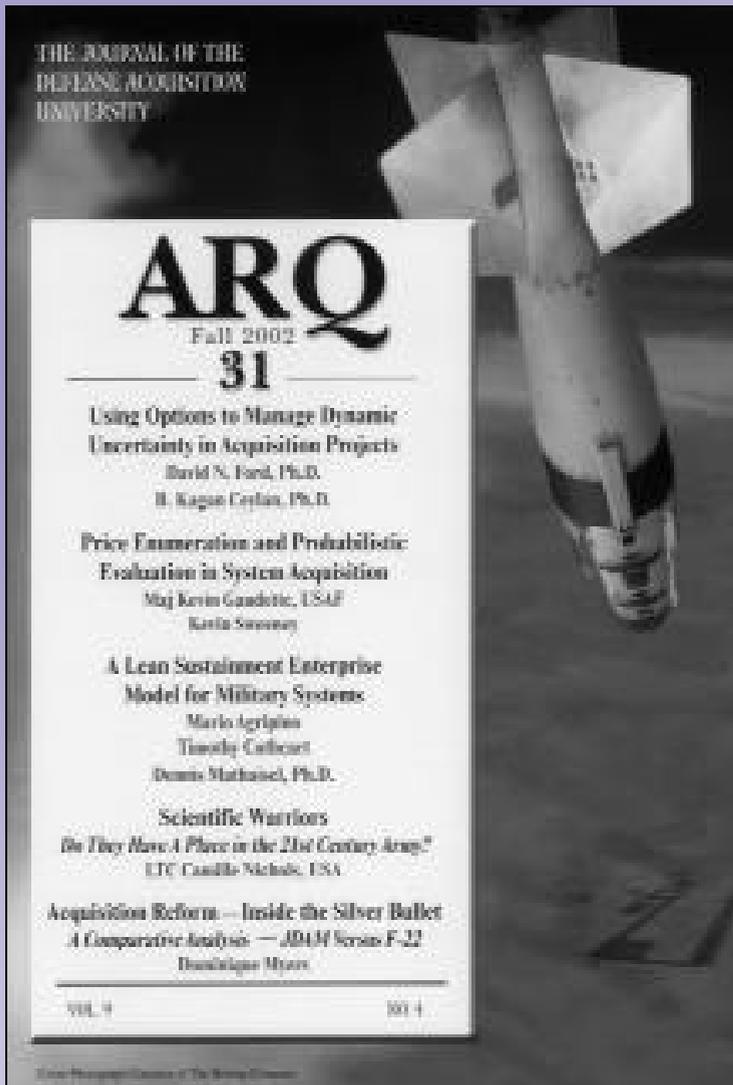
Individual—Andrew V. Fogle

Special—Richard S. Campbell

### DEFENSE CONTRACT MANAGEMENT AGENCY

Contractor—General Dynamics C4 Systems

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



# CALL FOR AUTHORS & REFEREES

## Call for Authors

The DAU Press is actively seeking quality manuscripts on topics related to Defense acquisition. Topics include opinions, lessons-learned, tutorials, and empirical research.

References must be cited in your bibliography. Research must include a description of the model and the methodology used. The final version of your manuscript must conform to the *Publication Manual of the American Psychological Association* or the *Chicago Manual of Style*.

To obtain a copy of ARQ Guidelines for Authors, visit the DAU Web site (<http://www.dau.mil/pubs/arq/arqart.asp>). To inquire about your manuscript's potential for publication, call the DAU Press at (703) 805-3801 or DSN 655-3801; fax a request to (703) 805-2917, ATTN:

DAU Press (Norene Fagan); or e-mail Norene Fagan at ([norene.fagan-blanch@dau.mil](mailto:norene.fagan-blanch@dau.mil)).

## Call for Referees

We need subject-matter experts for peer reviews of manuscripts during our blind referee process. Please fax your credentials to (703) 805-2917, ATTN: ARQ Editor (Norene Fagan), DAU Press. We will then add you to our referee file.

## Special Call for Research Articles

We publish Defense acquisition research articles that involve systematic inquiry into significant research questions. Each article must produce a new or revised theory of interest to the acquisition community. You must use a reliable, valid instrument to provide measured outcomes.

*Acquisition Review Quarterly* is listed in *Cabell's Directory of Publishing Opportunities in Management and Marketing*.

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EXCELLENCE**

# Building Communities of Practice

## Team Meetings Build Networks and Trust for Online Collaboration

DAVID P. BROWN

**T**he Systems Engineering Community of Practice recently began a series of face-to-face meetings to expand membership and increase member involvement. Systems Engineering is but one of a growing number of communities within the Program Management Communities of Practice. This community is an Office of the Secretary of Defense initiative that is being executed by the Defense Acquisition University (DAU). The Navy Acquisition Reform Office has been an integral partner in the stand-up of this initiative.

### Knowledge Access Will Mitigate Future Lack of Mentors

Traditionally, new personnel reporting to a program office were mentored by more experienced personnel as they learned their jobs within the acquisition community. However, with about 50 percent of the acquisition workforce becoming retirement-eligible by 2005, there may be insufficient mentors available within an office or organization to handle such a large number of replacements.

Thus, the Program Management Communities of Practice are designed as a knowledge management system to allow acquisition personnel to easily access information outside their office or organizational structure. Even if no one within the organization knows the answer to difficult problems, in all likelihood someone within one's own community of expertise can help.



Members of the Systems Engineering Community of Practice from the DAU Midwest Region at Wright-Patterson Air Force Base participate via VTC hook-up in the first community meeting, held July 11, 2002, at the VTC Center, DAU Capital and Northeast Region, Fort Belvoir, Va.

### Registration—Putting People in Touch

A central mission of the communities of practice is putting people who have a problem in touch with others who can help them. One major focus of building the communities of practice is to get people to register as community members. Registration is simple and can be

accomplished online at <http://www.pmcop.dau.mil>.

Registration provides a type of "Yellow Pages," listing contact information for people with expertise in particular areas. As DAU leader of the Systems Engineering Community, I find this database essential for identifying people who are

*Brown is a Professor of Systems Engineering in the Technical and Engineering Department at the Defense Acquisition University where he has been a faculty member for five years. He retired from the U.S. Navy with over 22 years of operational and acquisition assignments. Brown holds a B.S. in Systems Engineering from the U.S. Naval Academy and an M.S. in Aeronautical Engineering from the Naval Postgraduate School. He is currently in the dissertation phase of his Doctorate in Information Technology at George Mason University working in the area of modeling and simulation. He is also a graduate of the U.S. Naval Test Pilot School and Naval War College. Brown is a member of the International Council on Systems Engineering (INCOSE) and is currently the DAU leader for Systems Engineering for the Department of Defense Program Management Community of Practice.*

most likely to possess the knowledge and experience necessary to advise registrants who request assistance with a problem through the community Web site.

Registration and participation are completely voluntary. You may access and use the communities of practice with-

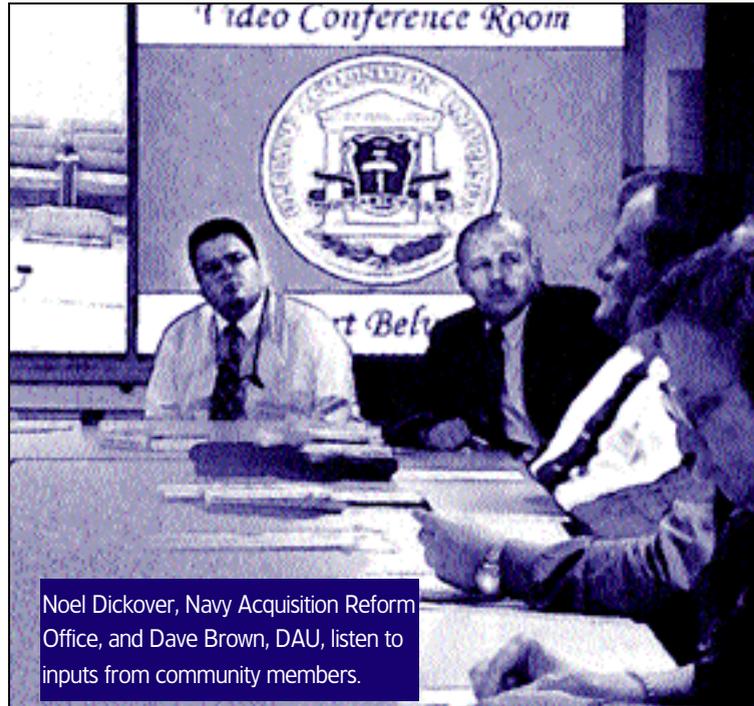
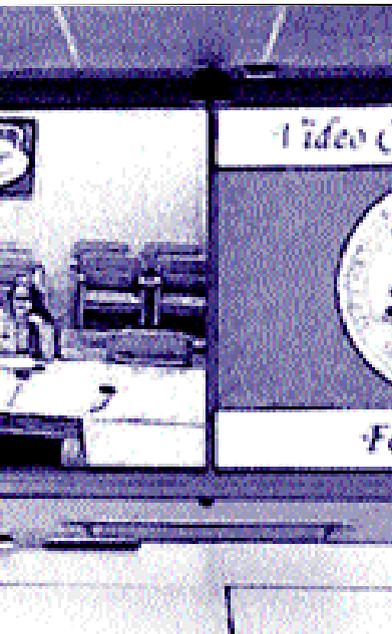
out registration. However, only registered users may post material to the site and access personal information about other registered users. These restrictions are necessary to comply with current DoD policies concerning Web site security and privacy.

### Other Support Tools

The communities of practice provide a variety of other support tools to assist the acquisition workforce. One of the most frequent scenarios DAU receives from the field is an individual who is

assigned a task, and is looking for a good example from another program of what the final product should look like. We are looking for good examples of unclassified documents such as Systems Engineering Management Plans, Modeling and Simulation Master Plans, Test and Evaluation Master Plans, etc., for use by other community members. We have available a number of documents and job aids and are looking for programs and other organizations that have developed in-house products they are willing to share.

One example of a recently acquired job aid is an automated tool for assessing technology readiness levels. Two versions are available: one for hardware and the other for software. These tools were developed by the Government Accounting Office (GAO) and provide an estimate of the technology readiness level based on responses to a set of questions about the technology. Use of this tool by DoD programs should provide



Harry Botsford, Naval Air Systems Command, speaks to community members on computer tools for Systems Engineering.

a valuable aid in that program managers should be able to get a good idea of where the GAO would assess their technology readiness level. If the level does not match the recommended level for a particular milestone, the PM can work with the tool to figure out what things need to be changed to achieve the desired level.

Another example of an automated tool is the PC/S risk management software provided by Aeronautical Systems Center Engineering Directorate at Wright-Patterson Air Force Base. This program provides an excellent risk management tool that provides a color scatter plot identifying high-, medium-, and low-risk areas being assessed. The program has even been modified in response to inputs by community members requesting format changes and additional functionality.

### Collaborative Online Projects

Many organizations leverage information technology to conduct collaborative online projects from geographically dispersed locations. Management guides dealing with these types of projects recommend a face-to-face meeting of participating team members at the beginning. This allows team members to develop personal relationships and to build trust for working together in a virtual environment. Collaborating online is easier if you can place a face and an actual person with impersonal communications such as phone calls or e-mails.

Borrowing a page from this manual, the Systems Engineering Community of Practice began face-to-face meetings to spread the word about PMCoP and to allow people to network and develop personal relations for follow-on online collaboration. The first of what is hoped to be a series of community meetings was held July 11, 2002. The meeting was held in the VTC Center, DAU Capital and Northeast Region at Fort Belvoir, Va. Members from the DAU Midwest Region at Wright-Patterson Air Force Base participated via VTC hook-up. Over 40 people representing a broad cross-section of both industry and gov-

Participate in a Community  
**One major focus of building the Communities of Practice is to get people to register as community members.**  
 Registration is simple and can be accomplished online at <http://www.pmcop.dau.mil>

ernment attended the meeting and presentation.

The speaker, Harry Botsford of the Naval Air Systems Command, focused his presentation on automated tools for Systems Engineering. Presentations are planned around member consensus on topics of interest. A survey conducted at the stand-up of the Systems Engineering Community of Practice found strong user interest in automated or computer-based tools to assist members in performing daily office tasks.

Botsford provided an excellent presentation on a number of such tools that are available and have been successfully used in program applications. Hopefully, community meetings will begin at other geographic locations as the regional DAU campuses stand-up to full-service capability and onsite leaders are identified.

### Meeting the Needs of the Members

The Communities of Practice are an OSD acquisition excellence initiative. However, the guidance from OSD has been to tailor the communities to whatever structure the membership collectively agrees upon. I can assure all readers that as the leader of the DAU Systems Engineering Community, I have not received any guidance or instruction from OSD other than to ensure that whatever

is done meets the needs of the members.

The success or failure of this initiative will rest in the hands of the acquisition workforce; therefore, I encourage everyone to log on, register, participate, and provide your input. If you have particularly good things going on in your projects or programs, consider sharing them with others. It will likely be a difficult period during the latter half of this decade as we replace a number of acquisition workforce members and the new members gain the experience of the people they replaced. It is not necessary to reinvent every wheel and relearn every lesson. An online repository of knowledge, tools, and information and a network of domain experts who are willing to help anyone with a problem will make everyone's job easier.

If you still aren't sure that this is something you want to support, consider this: That big cost overrun caused by an inexperienced person making the wrong decision—even though information was available that could have prevented the mistake—just might be in your program!

Editor's Note: Brown welcomes questions or comments on this article. Contact him at [dave.brown@dau.mil](mailto:dave.brown@dau.mil).

# 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, Acquisition Initiatives (AI)

<http://www.acq.osd.mil/ar>  
Acquisition news and events; reference library; AI 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://web1.deskbook.osd.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; and training news from the Defense Acquisition Workforce.

#### Defense Acquisition University Virtual Campus

<https://dau1.fedworld.gov>  
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 business 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://nardic.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.

#### 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.



# Acquisition & Logistics Excellence

An Internet Listing Tailored to the Professional Acquisition Workforce

## 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.

### Topical Listings

#### 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 noteboard.

#### 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.dsmcaa.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 Logisticians 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>

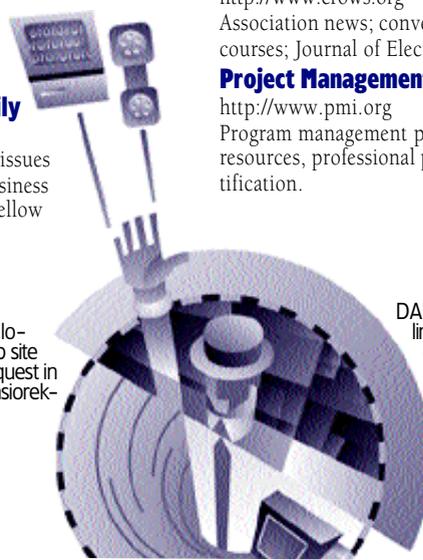
Association news; conventions, conferences and courses; Journal of Electronic Defense magazine.

#### 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@clau.mil](mailto:webmaster@clau.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 corresponding number on the lower left corner, reverse side of the pho-

tographs. 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. These files should be placed on our server via FTP (File Transfer Protocol). (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.



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Acquisition University