

Transitioning the Defense Acquisition Deskbook

JULY-AUGUST 2002

P M

PROGRAM MANAGER



SIX TEAMS HONORED AT
2002 PACKARD AWARDS



*U.S. Air Force Academy
Cadet First Class Jereme Estes
Cadet Program Manager
FalconSat-2 Program*



ALSO IN THIS ISSUE:

DAU INTRODUCES ONLINE
INTERNATIONAL COURSE

LEADING PROJECT TEAMS

ACODEMO—WHERE SOME OF
US ARE NOW AND WHERE THE
REST OF US ARE HEADING

BEST VALUE FORMULA

SECRETARY ALDRIDGE MAY
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REFLECTIONS ON TEST AND
EVALUATION

*"Only the Paranoid Survive"
How Short Range Air Defense
Artillery (SHORAD) is Exploiting a
Strategic Crisis Point*

FalconSat-2 Small Satellite (SmallSat) Program—A Hands-on Approach to Cadet Satellite Procurement at the U.S. Air Force Academy



PROGRAM MANAGER

Vol XXXI, No. 4, DAU 169

Some photos appearing in this publication may be digitally enhanced.



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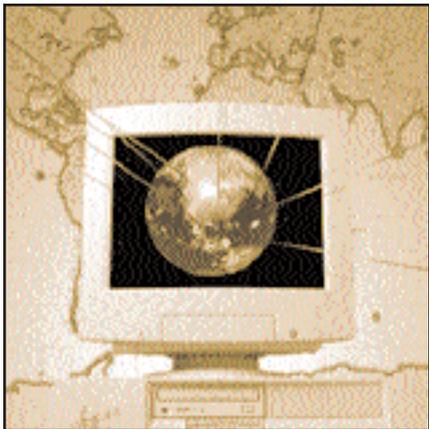
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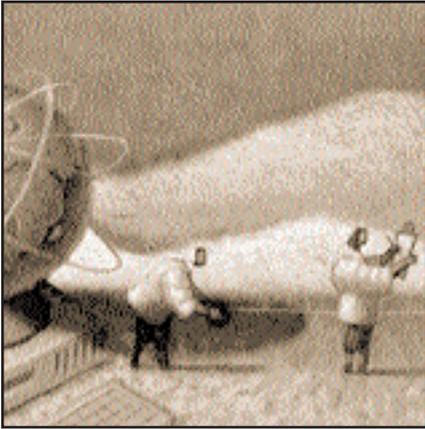
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UNIVERSITY**

Correction: The e-mail address shown for Tom Castino on p. 28 of the March-April 2002 issue of *Program Manager* is incorrect. The correct address is Tom.Castino@usul.com.



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“Learn Space by Doing Space”

A Hands-On Approach to Cadet Satellite Procurement at the Air Force Academy

CAPT. JOHN MARTIN, USAF • LT. COL. JERRY SELLERS, USAF •
LT. COL. STEVE GREEN, USAF (RET.)

In 1997, Principal Deputy Assistant Secretary of the Air Force for Acquisition and Management Darleen Druyun announced 11 “Lightning Bolt Initiatives,” designed, among other things, to develop superior acquisition strategies. Lightning Bolt No. 10, “Reducing Cycle Times,” aimed to reduce the time from requirements definition to contract award. In this article, the methodology used to apply this initiative to the U.S. Air Force Academy Small Satellite (SmallSat) program is discussed.

SmallSat Program

The SmallSat Program Office, located at the U.S. Air Force Academy (USAF) in Colorado Springs, Colo., gives cadets the opportunity to “learn space by doing space.” Led by an interdisciplinary team of military and civilian academicians from three academic divisions (engineering, basic sciences, and social sciences), top cadets are designing, building, and testing a nano-satellite (extremely small). This nano-satellite, dubbed FalconSat-2, is currently ahead of schedule for delivery to the National Aeronautics and Space Administration (NASA) in summer 2002, with a launch date scheduled on the Space Shuttle Atlantis (STS-114) for Jan. 16, 2003. Air Force Col. Eileen Collins, a former Associate Professor at the Academy, will command the Shuttle, while Air Force Lt. Col. James Kelly, a 1986 graduate of USAFA, will pilot the Shuttle.

Martin is an Assistant Professor of Management, Sellers is Director of the SmallSat Research Center, and Green is an Associate Professor of Management at the U.S. Air Force Academy, Colorado Springs, Colo.



Top cadets at the U.S. Air Force Academy are designing, building, and testing a nano-satellite dubbed FalconSat-2 (FS-2). FS-2 is currently ahead of schedule for delivery to NASA in summer 2002, with a launch date scheduled on the Space Shuttle Atlantis (STS-114) for Jan. 16, 2003. Pictured from left are key leaders on the FalconSat-2 Program Team: Air Force Lt. Col. Jerry Sellers, Director, Small Satellite Research Center; Cadet First Class Luke Sauter, Cadet Chief Engineer, FalconSAT-2; Cadet First Class Jereme Estes, Cadet Program Manager, FalconSat-2; and Air Force Capt. John Martin, Director of Support and Logistics, FalconSat-2. In the center is the FalconSat-2 nano-satellite.

The Small Satellite Program is a two-semester course taught and administered by the Department of Astronautical Sciences. While working with the interdisciplinary team, cadets have the opportunity to gain real-world experience with satellite design, assembly, integration, testing, and operations. Their activities mirror those of a traditional program of office in almost every aspect except size.

The Drivers

What drove the development of this capstone course? One very obvious reason was to give cadets an experience whereby they could culminate three

years of rigorous core courses from the four academic divisions and apply the various theories learned to a real-life situation with scenarios similar to those encountered by Air Force officers. Whether the cadets become pilots, scientists, program managers, or contracting officers, many of these future officers will hold positions involved in the design and procurement of major weapons systems—the FalconSat-2 program uniquely prepares cadets to take on these responsibilities.

In the FalconSat-2 program, a cadet program manager is selected who has “cr-

The Small Satellite Program is a two-semester course taught and administered by the Department of Astronautical Sciences. While working with the interdisciplinary team, cadets have the opportunity to gain real-world experience with satellite design, assembly, integration, testing and operations. Their activities mirror those of a traditional program office in almost every aspect except size.

dle-to-grave” responsibility for program completion. Also, other cadets perform functional duties such as engineering, documentation, production, test, logistics, and program control.

Another reason for the adoption of this course is that FalconSat is ranked 21 of 34 essential programs by the Department of Defense Space Experiments and Review Board (SERB). The Air Force Office of Scientific Research (AFOSR) contributes funding to FalconSat because of their keen interest in the payload, which is designed to measure and record plasma depletions in the ionosphere. The FalconSat program depends on generous funding from the AFOSR and the Space and Missile Systems Center Space Test Program (SMC-STP). The team also benefits from significant access to resources at the Air Force Academy, including lab supplies as well as machine and electrical shop support and expertise.

Challenges

FalconSat-2 faces challenges that are not faced by traditional acquisition programs.

Turnover

First, the cadet team is composed mostly of seniors (“firsties”). As a result, new

CADET FIRST CLASS JEREME ESTES

*U.S. Air Force Academy
Major: Management*



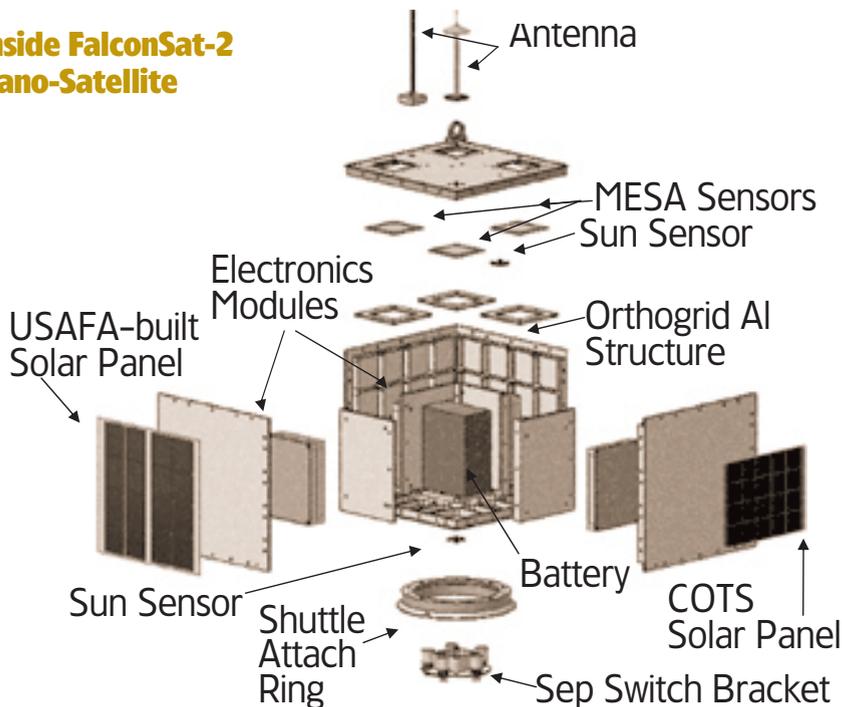
Cadet Estes is the Cadet Program Manager for the FalconSat-2 program and academically ranked the No. 1 management major of over 180 seniors at the Air Force Academy. Additionally, he earned the distinction of Outstanding Management Major.

A 1995 graduate of Norman High School in Norman, Okla., Estes served the Air Force for over two years as an enlisted medical technician before his acceptance into the Academy through the Leaders Encouraging Airmen Development (LEAD) program.

During his cadet career, Estes was a Soaring Instructor Pilot, completed the SCUBA open water certification program, and earned his jump wings.

Estes is currently leading 1,000 cadets as second group commander. Selected as a recipient of the graduate scholarship program, Estes will attend the University of Pittsburgh where he will earn a Master’s in Business Administration degree. Following graduate studies, Estes will serve the Air Force as a contracting officer.

Inside FalconSat-2 Nano-Satellite



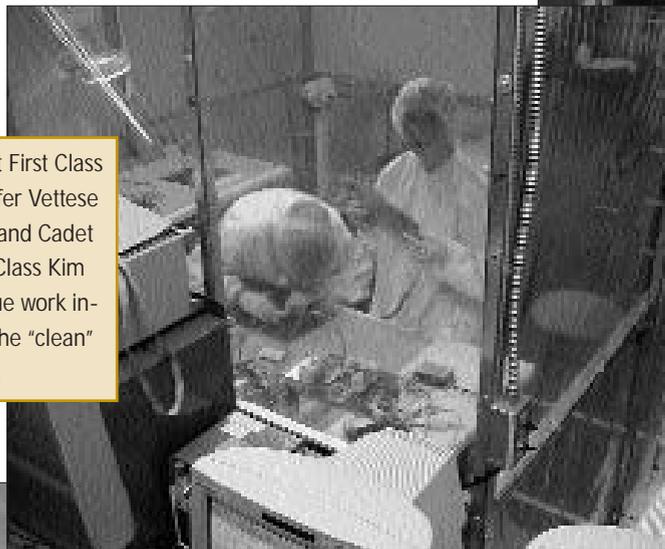
"FIRSTIES," JUNIORS, EXPERIENCED FACULTY WORKING TOWARD SUMMER 2002 DELIVERY DATE OF FALCONSAT-2 NANO-SATELLITE "IT TAKES A TEAM"



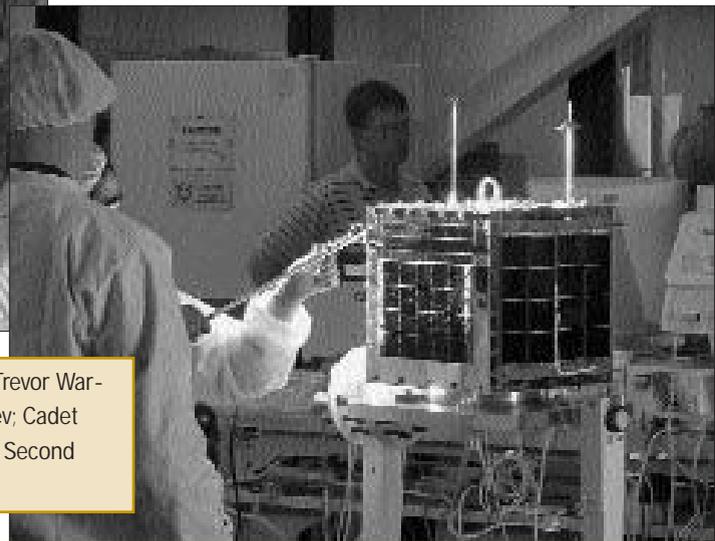
Cadet First Class Jereme Estes, FalconSat-2 (FS-2) Program Manager, and Cadet First Class Luke Sauter, FS-2 Chief Engineer, are pictured with the FS-2, which is scheduled for launch by NASA in January 2003.



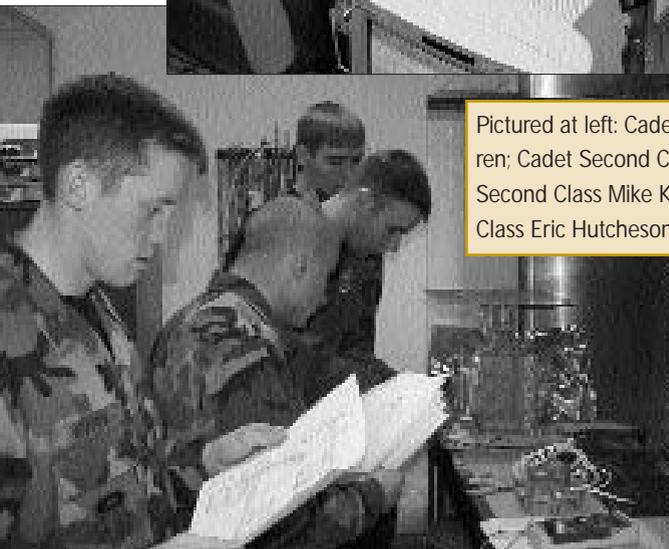
Cadet First Class Mike Kump (foreground) and Cadet First Class Jae Seo working at the "clean" bench.



Cadet First Class Jennifer Vettese (left) and Cadet First Class Kim Sugrue work inside the "clean" room.



Pictured at left: Cadet Second Class Trevor Warren; Cadet Second Class "GT" Gotchev; Cadet Second Class Mike Kump; and Cadet Second Class Eric Hutcheson.



Pictured above are members of the FalconSat-2 Program Team working on the nano-satellite in "the clean room." The clean room is an environmentally controlled area with filtered air to ensure no more than 10,000 particles per cubic cm of dust. Clean rooms serve two purposes: 1) they provide a clean, dust-free environment for the assembly of flight hardware, and 2) they provide controlled access to a room where all entering must wear special clothing and gloves. This creates the mental discipline to work carefully around expensive hardware.

At approximately 4 percent of the contract award cost as a fee for service, the General Services Administration Indefinite Delivery/Indefinite Quantity contract procurement method has proved to be a fair value and extremely efficient as well—and definitely in the spirit of Lightning Bolt No. 10, “Reducing Cycle Times.”

students have to literally fight a steep learning curve each academic year, while the interdisciplinary team of advisors spends valuable resources training the new group of cadets.

While using a nearly all-senior approach to staffing certainly has disadvantages, there are incredible advantages as well. FalconSat-2 gains a group of cadets that have proven themselves on academic and leadership aspects of cadet life during their first three years at the Academy. Additionally, these cadets understand the theories they have learned from their rigorous core courses and are ready to apply them in the FalconSat-2 project.

Recognizing the challenges of training a new staff each year, FalconSat-2 has begun integrating juniors into the course. This approach allows the seniors to train their replacements during their final term of study, and also gives the juniors real on-the-job training instead of “trial by fire.” Additionally, as FalconSat-2 approaches their summer 2002 delivery date, rather than stretch the al-

ready thin student resources even more so, the increased trained staff of juniors can handle the inevitable surges in workload.

Procurement

Perhaps the single greatest challenge is maintaining the aggressive delivery date with NASA. This drives the procurement strategy. After considering a variety of procurement options, a final decision was made.

The procurement involves anything from spectrum analyzers and connectors to solar panels and major nano-satellite subsystem components. Combine these unique requirements with an initial delivery date of less than one year, and it is easy to understand why locating a fast and reliable procurement method is a cornerstone to the success of FalconSat-2.

The initial choice in the FalconSat procurement strategy was to consider a robust acquisition methodology. Since the lead time was short, combined with a lack of staff, the notion of conducting a traditional source selection was abandoned. In addition to time and staffing constraints, the team felt that a more viable method existed that would also take into consideration the program staff constraints and the limited budget (under \$1 million). With such fiscal constraints, a traditional source selection involving a large program office staff would not be practical.

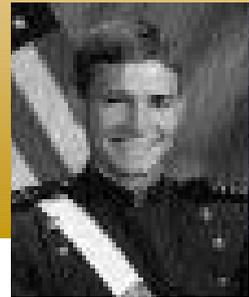
A traditional source selection would have involved assembling a team, including a contracting officer, recorder, program manager, technical experts, and support staff. Considering the FalconSat-2 program management team is part-time—the bulk of their time is spent in the classroom providing instruction in their academic disciplines—scheduling time for the team to meet would be improbable, not to mention unfair to potential bidders who could not reach the team on a consistent basis.

Lightning Bolt No. 10 Strikes

As a result of these budget and schedule constraints, the FalconSat Program

CADET FIRST CLASS LUKE SAUTER

*U.S. Air Force Academy
Major: Astronautical
Engineering*



Cadet Sauter is the Cadet Chief Engineer for the FalconSat-2 program and academically ranked the No. 1 major in Astronautical Engineering. A 1998 graduate of Eaton High School in Colorado, Sauter earned a direct appointment to the Air Force Academy.

Cadet Sauter has excelled during his Air Force Academy experience, earning the Superintendent's Pin six of eight semesters for outstanding performance academically, militarily, and athletically. In summer 2001, Sauter conducted summer research at NASA's Jet Propulsion Laboratory, aiding NASA engineers in determining the extent of communication issues with the next generation of MARS landers.

During the last year, he has written and presented four papers at national conferences. After graduation, Sauter will attend the Massachusetts Institute of Technology on a Draper Labs Fellowship. Following his studies, he will serve the Air Force as an engineer.

Office decided upon an Indefinite Delivery/Indefinite Quantity (ID/IQ) contract vehicle. An ID/IQ contract is similar to a Sears Catalog in that the program office examines a contract schedule to determine if the right mix of goods (equipment) and engineering services are available, and then sends the appropriate funds, along with a statement of work, so that a source selection can be convened.

While the abbreviated process described here sounds simple, this is not always the case. Procurement efforts began in late 2000 when the FalconSat Program Office first approached a government agency with specific requirements. While the intent of their ID/IQ contract was rapid delivery for space requirements, slowly the FalconSat Program Office learned that this would not be the case for this particular situation.

Whether the actual reason was due to the relatively low-dollar requirement (competing with much higher budget programs) or because getting the actual hardware on the equipment tables proved to be a unique challenge, is still unclear. After time passed without a request for proposal (RFP), the FalconSat Program Office considered two other risk-reduction strategies. One option was to use the local base contracting shop for all procurement. The other option, which we eventually implemented, is discussed next.

General Services Administration ID/IQ—The Perfect Solution

The General Services Administration Information Technology (GSA-IT) group based in Denver, Colo., was the perfect fit for the FS-2 program. In fact, this successful partnership is what has kept FS-2 on schedule and within budget to date, while meeting the required performance criteria.

In March 2001, the FalconSat Program Office placed a call to the GSA-IT office requesting their assistance with the satellite subsystem requirements. From the beginning of our first association and ensuing business relationship, it was ob-

vious to our staff that this would be a story laden with success.

GSA quickly established FS-2 as a customer in their system, reviewed and approved the statement of work, and sent requirements out “on the street” for bids. After only 15 days, a proposal was received that met technical and budget expectations. In early June 2001, the FalconSat Program Office awarded a contract for the satellite subsystems and integration.

Not only was GSA used for the satellite subsystem requirements, they were approached for other equipment, including spectrum analyzers and solar panels. GSA quickly introduced other vendors that could meet the requirements, and after the RFP period was complete, the FalconSat Program Office selected those vendors capable of meeting cost, schedule, and technical performance criteria.

Using the ID/IQ contract was definitely an innovative way to approach acquisition for FalconSat-2. Rather than spending valuable resources on the acquisition, the faculty team has focused their time and energy where they are most important—to the cadets putting the satellite together. With such a tight delivery schedule, not much of a buffer can be allowed for slips in schedule. However, the faculty mentors stand ready to support the cadets in the most efficient way possible.

Next Step—Lift Off

Where does the FalconSat-2 program go from here? Active involvement with the contractor and GSA office will help to ensure successful delivery of the satellite components. Additionally, other needed items will continue to be procured. The plan is to use this tried and true method of partnering with GSA for future purchases as well. At approximately 4 percent of the contract award cost as a fee for service, the GSA ID/IQ contract procurement method has proved to be a fair value and extremely efficient as well—and definitely in the spirit of Lightning Bolt No. 10.

An Indefinite Delivery/Indefinite Quantity contract is similar to a Sears Catalog in that the program office examines a contract schedule to determine if the right mix of goods (equipment) and engineering services are available, and then sends the appropriate funds, along with a statement of work, so that a source selection can be convened.

Of course, not all procurement efforts will meet with the success that FalconSat-2 has enjoyed. But the cadets at USAFA learned first-hand about acquisition and logistics excellence, and the benefits to be derived from considering an alternative strategy that will ultimately help reduce programmatic risks and raise the potential of a successful acquisition program.

See you in space!

Editor's Note: As we go to press, NASA, due to unforeseen circumstances, has temporarily postponed the January 2003 launch from the Space Shuttle of the FalconSat-2 nano-satellite. The new launch date has not yet been released. The authors welcome questions or comments on this article. Contact Sellers at jerry.sellers@usafa.af.mil. Contact Martin at john.martin@usafa.af.mil. Contact Green at steve.green@usafa.af.mil.

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The Journal of Public Procurement (JoPP)
DUE BY: SEPT. 30, 2002

**JoPP Special Topic
Issue: "Transforming
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The Journal of Public Procurement (JoPP) is a peer-reviewed journal dedicated to the study of public procurement. JoPP publishes manuscripts in all areas of government procurement, including general and new theoretical developments, results of research that advance understanding of fundamental public procurement, and important practical innovations and developments.

A symposium on "Defense Acquisition Transformation" has been commissioned for publication in a future issue of the peer-reviewed, academic Journal of Public Procurement. Both empirical and conceptual articles will be considered for the special issue. Guest editors for this special topic issue will be Dr. Timothy Reed and Dr. Michael Greiner.

Potential Topics for Consideration

- Antecedents of and processes for the successful transformation of defense acquisition organizations
- Application of commercial sector best practices to defense acquisition
- The role of electronic commerce in transforming defense acquisition
- Supplier and supply chain management in defense acquisition
- Innovative organizational design and human resource implications of transformation
- Strategic sourcing

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**VOLUME 2
NUMBER 1
2002**

The preceding listing of potential topics is just a sampling of the research areas in which the editors of JoPP would be interested. Other topics related to "Transforming Defense Acquisition" are also encouraged. Papers will be evaluated based upon three criteria: 1) readability, 2) relevance, and 3) reliability.

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Requirements**

Corresponding authors should send four (4) copies of their manuscript (along with a diskette with an MS Word-compatible file) for review to:

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A signed cover letter to the Editor must be enclosed requesting review for possible publication in the special topic issue. The letter must state that the manuscript has not been previously published and is not under review by another journal. Finally, the letter should include the corresponding author's address, telephone and fax numbers, and e-mail address.

Additional JoPP style and submission guidelines are provided at <http://www.fau.edu/pprc/journal.html>. The deadline for manuscript submission is Sept. 30, 2002. Papers should be clearly marked as submissions for the JoPP special issue on "Transforming Defense Acquisition."

“Only The Paranoid Survive”

How Short Range Air Defense Artillery is Exploiting a Strategic Crisis Point

LT. COL. SCOTT E. SHIFRIN, USA • ANITA WOOD

Under Andrew Grove’s leadership as President and CEO, Intel Corporation became the world’s largest computer chip producer, the fifth-most-admired company in America, and the seventh-most-profitable company among the Fortune 500. Grove’s insights and experiences offer a creative new way of dealing with the “nightmare moment” every leader dreads—the moment when massive change occurs and all bets are off.

The U.S. Army is in the midst of massive change as they define their roles and missions and how to implement evolving strategy to achieve the Objective Force. The Army can draw lessons learned from common business practices, thereby assisting military leaders in the transformation to an Objective Force Army.

This article will examine strategic crisis points from business that directly parallel the Army’s transformation of



Cutaway of a Cruise Missile



The Avenger is a non-developmental item (NDI), lightweight, highly mobile and transportable surface-to-air missile/gun weapon system mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV). Mounted on the turret are a .50 caliber M3P machine gun and two Standard Vehicle Missile Launchers (SVMLs), both of which contain four Stinger missiles.

Complementary Low-Altitude Weapons System (CLAWS) firing an AMRAAM AIM-120 missile from a U.S. Marine Corps High Mobility Multipurpose Wheeled Vehicle (HMMWV) platform during a Ballistic Missile Test Flight at Eglin AFB, Fla., on Oct. 24, 2001. The U.S. Army configuration for SL-AMRAAM is yet to be fully defined.



Shifrin is the Product Manager, SHORAD Missiles and Platforms, Redstone Arsenal, Ala. He holds a Bachelor of Business Administration from Texas Tech University and a Master of Business Administration from Southwest Texas State University. He is a member of the Army Acquisition Corps. **Wood** is a Senior Engineer with CAS, Inc., Huntsville, Ala. She holds a Bachelor of Science in Electrical Computer Engineering from the University of Alabama at Huntsville and is currently enrolled at Florida Institute of Technology pursuing a Master of Science in Management. She has 17 years’ experience in Program Management, working on various Air Defense programs.

An Unmanned Aerial Vehicle (UAV) performs a reconnaissance mission and relays damage assessment intelligence information back to headquarters.



Short Range Air Defense (SHORAD) roles and missions. The current SHORAD weapon systems consist of the line-of-sight Stinger missile based on a High Mobility Wheeled Vehicle (Avenger), the Bradley Fighting Vehicle (Linebacker), as well as the Man-Portable System (MANPADS), with the mission to

protect maneuver forces and critical assets from air and missile attack.

What is a Strategic Inflection Point?

As defined by Grove in his book *Only the Paranoid Survive: How to Exploit the Crisis Points that Challenge every Company and Career*, the critical point where transformation must occur is known as a Strategic Inflection Point. This happens when the balance of forces shifts from the old ways of operating and doing business and is transformed into the new process.

Before the Strategic Inflection Point, the organization was simply working to the old way of doing business. But something changes that necessitates a new approach, a new thought process, a new strategy, a new mode of operation—

The Strategic Inflection Point is the catalyst for change, and is the singular factor that causes action. When a strategic inflection point hits, all past rules shift fast, furiously, and forever.

or failure will be imminent. What worked in the past doesn't work anymore. The Strategic Inflection Point is the catalyst for change, and is the singular factor that causes action. When a Strategic Inflection Point hits, all past rules shift fast, furiously, and forever.

In business, Strategic Inflection Points can be set off by almost anything: intense competition or changes in regulations, technology, leadership, or funding. A prime example of a Strategic Inflection Point can be seen when Wal-Mart builds in a small town—everything changes. Wal-Mart's logistics, computerized inventory management, large volume-based purchases, and company-wide training programs are no match for the hometown store. Wal-Mart's customer service, their can-do attitude, and their capability to lower prices corner the market. The hometown store's failure to either recognize or adapt to the change allows for a quick transformation shift.

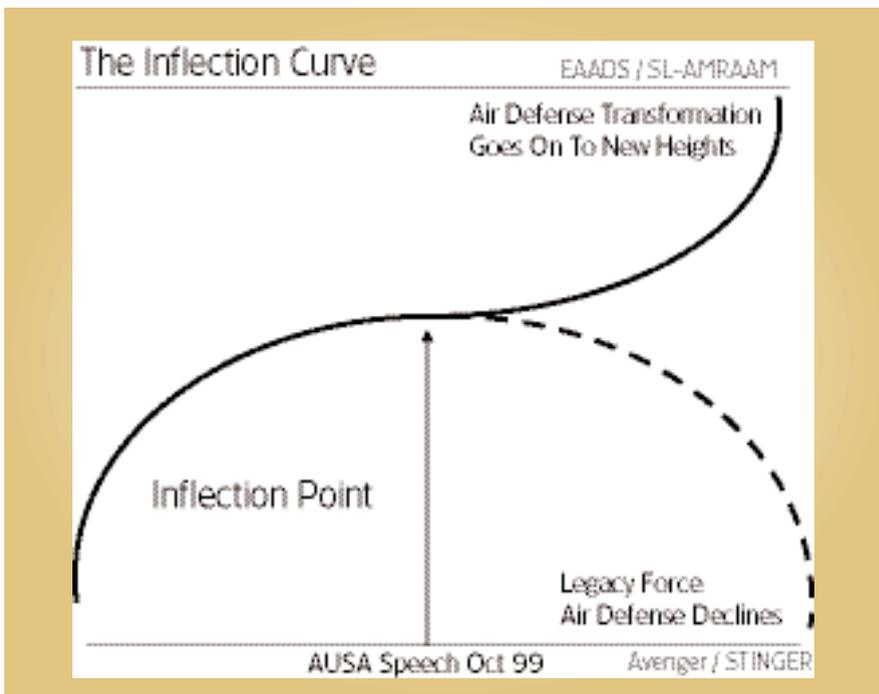
Intel's Strategic Inflection Point

The computer industry has changed significantly over the last 20 years. During the 1980s, the computer industry (namely IBM, DEC, Sperry Univac, and Wang) sold computers as a "company package" that involved proprietary design, chips, computers, operating systems, and application software that was marketed and sold by company sales-



Surface Launched Advanced Medium Range Air-to-Air Missile (SL-AMRAAM) based on a High Mobility Multipurpose Wheeled Vehicle (HMMWV). This initial capability "system of systems" includes the launcher, missile, external sensor, and BMC4I [Battle Management Command, Control, Communications, Computers and Intelligence], that will enhance Air Defense by providing a netted and distributed architecture, compatible with the current SHORAD force, and has a missile that is interoperable with the other Services.

FIGURE 1. SHORAD Strategic Crisis Point



people. This was an expensive “vertical” purchase in that the customer got only what a particular company offered by purchasing their proprietary computer package.

In the mid 1990s, a crisis point in the industry occurred with the explosive rise in micro-processing power and the popularity of personal computers, combined with a dramatic drop in price. This changed the entire structure of the computer industry, and a new horizontal industry emerged to such an extent that no one company had the total edge on the market. A consumer could “mix and match” microprocessors, computer manufacturers, operating systems, and any one of many off-the-shelf software applications at any retail or computer store. The computer industry’s transformation from the old vertical “cradle to grave” model to the new horizontal model took place over many years in small incremental steps. Intel had to adjust to the new market paradigm or face extinction.

What happened to cause this change? In retrospect, Grove identifies *the Strategic Inflection Point as when the Japanese entered the memory production market and began research and development of new*

chips to lead the world market. In one Japanese company, it was reported that the memory development activities alone were in a large high-rise production building where, on separate floors, designers researched and developed several new generations of memory.

Compare this to the relatively small amount of memory chip development in the United States, with little to no investment in research and development, and it is easy to see why the United States was looking over its shoulder. The U.S. companies could not compete against Japanese low-cost, high-quality products. The computer industry was reliving the tribulations of other U.S. industries such as televisions, automobiles, steel manufacturing, and machinery that felt the impact of a Strategic Inflection Point from aggressive Japanese competition. Understandably, management’s first reaction to a Strategic Inflection Point is denial. Some U.S. industries were losing the fight and losing money because they failed to recognize the Japanese business threat.

This transformation shift in the computer industry caused a “nightmare moment” for Andrew Grove and threatened Intel’s continued success. Fortunately,

Fighting through the strategic inflection point is not a fast or easily achievable process. It must be taken in small incremental steps over several years (much like Intel). It also requires the support of senior leadership as they articulate the future vision while listening to the community.

Intel’s management recognized and adapted to the shift before it was too late to change their legacy production. Given the history of other legacy U.S. industries, Intel’s senior management was struggling and fearful for the company’s future. Grove took charge and hoped the others would follow his lead. Recognizing the need to expand his knowledge base, he sponsored several grueling management-level debates and spent hours questioning and listening to employee’s issues and concerns on the extreme edges of the business.

In the end, Grove succeeded and was in the forefront of the computer industry by transforming and adapting Intel’s business from memory chip production to microprocessors. Intel increased production and marketed their microprocessor as the “brain” for any IBM-compatible computer, while concurrently phasing out their legacy memory production line. Intel’s lessons learned from the Strategic Inflection Point are: 1) notice the shift, 2) get smart on the

cause of the new shift, 3) strategically adapt to the shift, 4) prepare the business to transform, and 5) provide the resources necessary to make the transformation.

The U.S. Army Strategic Inflection Point

In the hands of good leaders, a Strategic Inflection Point can be an ace. The Army leadership has committed itself through the transformation process to turning this Strategic Inflection Point into a positive force to win—both in business through the acquisition community and on the battlefield through the acts of soldiers.

The 1990s were marked by the superior strength of the U.S. Army as we crushed Iraq in the Gulf War. After the war, serious reviews were undertaken to determine the strengths and weaknesses of the operational and technical capabilities of the Army and how they might be improved upon. No longer is it likely that an adversary will allow months of build-up and preparation, access to naval ports, and an opportunity to infuse the latest weapons and technology into maneuver units prior to conflict. The Army was too heavy, had

too long of a logistics tail, and was not agile and mobile enough to react to any crisis around the world.

Identification of these deficiencies was the beginning of the U.S. Army's Strategic Inflection Point. It also marked the beginning of a new era as the Army began infusing advanced technologies into the maneuver forces by developing the digitized division, and began the transformation of the Army to the Objective Force. This change for the Army is a crossroads, and can either mean an opportunity to rise to new heights or it might as likely signal the beginning of the end as weapon system developers adjust to the transformation of the force.

The SHORAD Strategic Inflection Point

In October 1999, Chief of Staff of the Army Gen. Eric K. Shinseki delivered the now famous Association of the United States Army (AUSA) speech unveiling the Army vision defining how the Army will meet the nation's requirements today and in the future. The Army is transforming into a force that is strategically responsive and dominant at every point on the spectrum of conflict.

This AUSA speech was a realization to the SHORAD community that it had to transform and better define its role on the future battlefield or be left in the past. This was the critical and defining moment for Short Range Air Defense Artillery (Figure 1). For the Short Range Air Defense Artillery, it means a strategic inflection point of huge proportions. SHORAD is now in the midst of a major transformation attempting to realign, adapt to the goals and direction of the Army, define roles and missions, and develop a new and more lethal path ahead for the Objective Force.

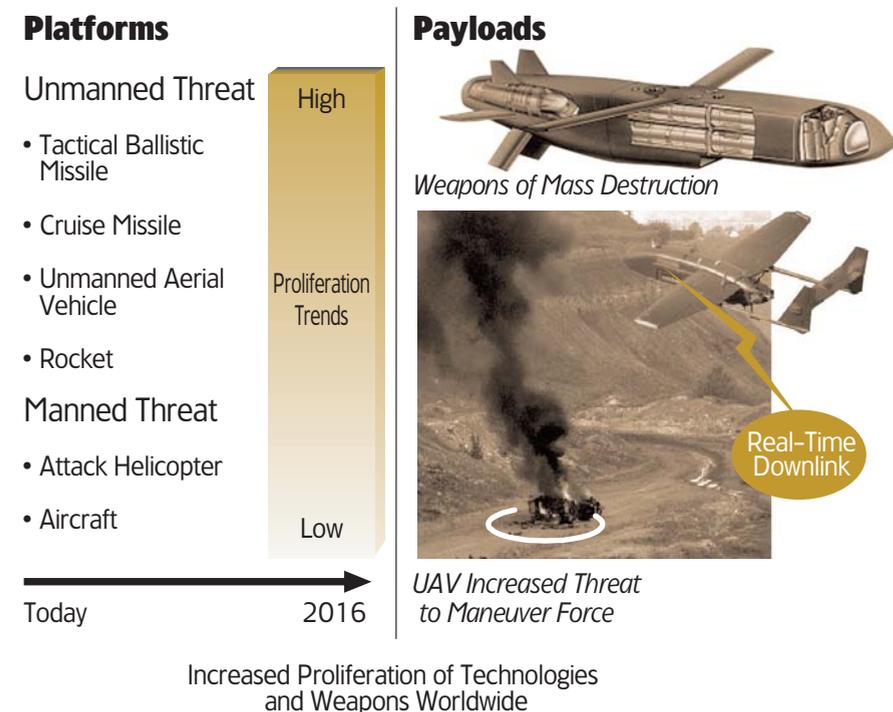
To understand why the Strategic Inflection Point occurred, we must begin by looking at the SHORAD Legacy Force. The Stinger missile has performed admirably over the last 20 years, first, with the Afghans when the Soviets invaded Afghanistan, then during the Gulf War, and today, in the struggle against terrorism. SHORAD must take action to position itself against an evolving threat with increased standoff capability, develop new and proactive methods for attacking the threat, and acquire the ability to quickly integrate new technologies when they become available.

With competition for fewer resources, funding for the Stinger-based platforms (Avenger and Linebacker) has been rescinded. As a result of the lack of funding, both the Combat Developer and the Material Developer recognized the urgent need to transform the maneuver Air Defense force. New ways of doing business had to be developed. SHORAD had no clear path ahead to protect the Army's maneuver forces from air and missile attack as they transform to the Objective Force.

SHORAD Path Ahead

The SHORAD transformation began by re-evaluating the threat to the maneuver force at the Unit of Action and Unit of Employment levels for the Objective Force timeframe. Now, the SHORAD force must concern itself with a new and growing threat, including targets beyond line of sight such as Unmanned Aerial Vehicles (both reconnaissance and combat), Cruise Missiles, as well as the tra-

FIGURE 2. Threat Proliferation Trends



ditional Rotary and Fixed Wing Aircraft. In the far-term, SHORAD must evolve to defeat Rockets, Artillery, and Mortars (Figure 2).

The Air Defense material and combat developer communities looked hard at future technologies, developing a leap-ahead or evolutionary acquisition approach that would provide for drastically improved capabilities in the near-term, while evolving the weapon system as the Army transforms to defeat threats in the far-term. Although still evolving as a result of the crisis point, it appears that Enhanced Area Air Defense System, or EAADS, will provide that opportunity and eventually replace most of the Stinger-based force.

Consistent with the development of the Future Combat System, the initial capability of EAADS is the Surface Launched Advanced Medium Range Air-to-Air Missile (SL-AMRAAM). This initial capability “system of systems” includes the launcher, missile, external sensor, and BMC4I [Battle Management Command, Control, Communications, Computers and Intelligence], that will enhance Air Defense by providing a netted and distributed architecture, compatible with the current SHORAD force,

and has a missile that is interoperable with the other Services.

The entire EAADS concept fits well with Shinseki’s Objective Force tenets—highly deployable, threat overmatch across the entire spectrum of conflict, and force-tailorable based on mission requirements (Figure 3).

SHORAD Lessons Learned

EAADS will be developed so that it will evolve in lockstep with the technology and the warfighter tactics, techniques, and procedures. Although the initial capability of EAADS (SL-AMRAAM) is a kinetic energy solution, it will have the ability to evolve to other more advanced kinetic energy and directed energy solutions as they mature. EAADS is an open architecture designed without any “dead end” solutions. Fighting through the Strategic Inflection Point is not a fast or easily achievable process. It must be taken in small incremental steps over several years (much like Intel). It also requires the support of senior leadership as they articulate the future vision while listening to the community.

A Proactive Step

The Army’s vision of transformation is a proactive step. Army leadership saw

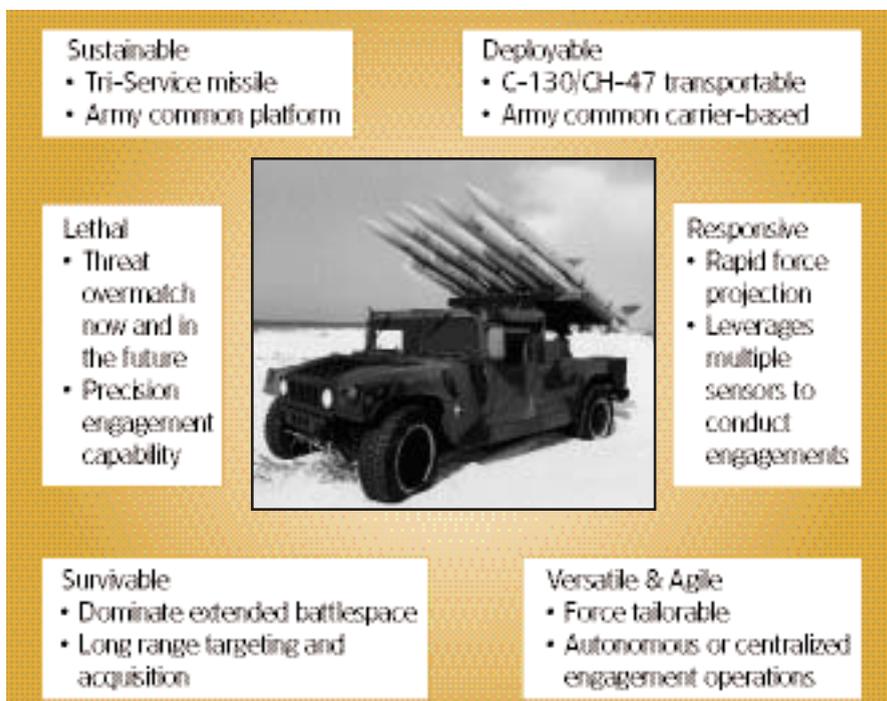
SHORAD must take action to position itself against an evolving threat with increased standoff capability, develop new and proactive methods for attacking the threat, and acquire the ability to quickly integrate new technologies when they become available.

the Strategic Inflection Point early enough and took the appropriate action to counter the expected future threat. The SHORAD community is diligently working toward the Objective Force goal and is applying the lessons learned from the business community. Countless hours of discussions, budget drills, requirements analyses, doctrine definition, planning, team building, and other exercises are paving the road to the new way of doing business.

We are operating under new guidelines with a new objective defined. As technology evolves, EAADS is the future for SHORAD. SHORAD has the competitive edge and path forward as the Air Defense Objective Force rises to new heights after positively responding to the Strategic Inflection Point.

Editor’s Note: **Shifrin** and **Wood** welcome questions or comments on this article. Contact them at scott.shifrin@redstone.army.mil or anita.wood@redstone.army.mil.

FIGURE 3. SL-AMRAAM Army Tenet Linkage





Navy Signs MOU to Transfer Ship Construction

The Navy announced today that it is signing a Memorandum of Understanding (MOU) with General Dynamics (GD) and Northrop Grumman Ship Systems (NGSS) to transfer ship construction between the two corporations' shipyards.

The MOU outlines the terms and conditions for transferring the construction of four LPD 17-Class amphibious transport dock ships from Bath Iron Works (BIW), a GD shipyard, to NGSS owned-Ingalls and Avondale shipyards in exchange for construction of four additional DDG 51-Class destroyers at Bath Iron Works. Under this plan, DDG 102, which was scheduled to be built at Ingalls, will be transferred to Bath Iron Works. LPD 19, in the initial stages of construction at Bath Iron Works, will be transferred to Northrop Grumman.

As a result of this agreement, the Navy is expected to realize significant net cost savings on these programs. The arrangement is anticipated to provide for increased LPD 17 program stability and cost savings by centralizing production at one shipbuilder—

NGSS—and improving workload stability at GD Bath Iron Works, which will build additional DDGs in its new, more efficient land-level facility.

Speaking about the agreement, Assistant Secretary of the Navy for Research, Development and Acquisition, John J. Young Jr. said, "The Navy and the shipbuilders have taken a bold step today. This shipbuilding transfer agreement will save the taxpayers money over the life of these two programs by dramatically reducing the cost and schedule risk in the LPD 17 program. The new fiscal 2002-2005 DDG multi-year contract's pricing and conditions were also negotiated in conjunction with the swap agreement. The signing of this MOU and the new DDG multi-year together stabilize the workload at three shipyards—Ingalls, Bath, and Avondale—and provide a solid plan for almost \$20 billion of Navy shipbuilding. This agreement is a win-win for both shipbuilders and the Navy."

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



WASHINGTON (June 18, 2002)—Under Secretary of Defense for Acquisition, Technology and Logistics Pete Aldridge today presented the David Packard Excellence in Acquisition Award to six Department of Defense teams at a Pentagon ceremony. The Packard Award is given to DoD civilian and/or military organizations, groups, and teams who have made highly significant contributions or demonstrated exemplary innovations and best practices in the Defense acquisition process.

The Joint Biological Point Defense System (JBPDS) Integrated Product Team, led by the U.S. Army, received the Packard Award for its performance in the accelerated deployment of a biological detection system after Sept. 11.

"Last year's Packard Award ceremony took place on Sept. 10. That award ceremony would prove to be the eve of war. Since then, the order of the day has been change and uncertainty; its imperatives have been adaptability and Imagination."

—Edward C. "Pete" Aldridge Jr.
USD(AT&L)
June 18, 2002

The Joint Air-to-Surface Standoff Missile (JASSM) System Program, led by the U.S. Air Force, received the Packard Award for its innovative teaming arrangements with industry and government agencies, providing the conventional long-range, air-launched cruise missile in one-third of the time and at half the unit price of comparable programs. JASSM provides autonomous precision attack capability against heavily defended, high-value, fixed and relocatable targets, and is designed for launch from U.S. Air Force bombers, and U.S. Air Force and U.S. Navy fighter aircraft.

The U.S. Special Operations Command received the Packard Award for its implementation of innovative acquisition approaches in developing the Multi-role Anti-armor Anti-personnel Weapon System.

The Geosynchronous Lightweight Technology Experiment Program Office of the National Reconnaissance Office received the Packard Award for superior program management and innovative acquisition practices in developing and deploying the GeoLITE satellite, which may revolutionize space-based communications.

The Theater High Altitude Area Defense Logistics Team of the Missile Defense Agency received the Packard Award for developing several innovative logistics concepts that potentially reduce operation and support costs throughout the system's service life.

The Pentagon Renovation (PENREN) Team received the Packard Award for its handling of emergency actions necessary to begin rescue, recovery, investigation, and reconstruction activity in the wake of the Sept. 11 terrorist attack on the Pentagon.

The Packard Award, the Department's highest acquisition award, is named in honor of the late David Packard, a former Deputy Secretary of Defense during the Nixon administration. He was also the co-founder and chairman of the Hewlett-Packard Co. and chairman of the President's Blue Ribbon Commission on Defense Management chartered by President Ronald Reagan in 1985. Packard was a strong advocate of excellence in defense acquisition practices.

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

2 0 0 2 P A Six DoD Agencies



Theater High Altitude Area Defense (THAAD) Logistics Team (MDA)



Joint Biological Point Defense System (JBPDS) IPT (Army)



Pentagon Renovation (PENREN) Program Team (WHS)

CKARD AWARDS

Honored for Acquisition Excellence



Geosynchronous Lightweight Technology Experiment (GeoLITE) Program (NRO)



Multi-role Anti-armor Anti-personnel Weapon System (MAAWS) (SOCOM)



Joint Air-to-Surface Standoff Missile (JASSM) Program (Air Force)

SPS Users Meet for Second Joint Conference

Forum Encourages Sharing of Ideas and Solutions

LINDA POLONSKY-HILLMER

The second Joint Standard Procurement System (SPS) Users' Conference, held April 23–25 in San Antonio, Texas, attracted more than 325 users from around the world. Hosted by the Air Force and sponsored by the SPS Joint Program Management Office (JPMO), this year's event introduced several new tools to SPS users, including the latest version of SPS—Procurement Desktop-Defense (PD²) version 4.2 Increment 1.

Version 4.2 Increment 1 was delivered on schedule to the government and is currently undergoing testing. "The testing is going very well at this time," reported Army Col. Jake Haynes, SPS Program Manager. "We haven't found any major discrepancies, which is good progress and probably means we'll deploy on schedule."

This latest version of SPS is scheduled to begin deploying to Army post, camp, and station environments in late summer/early fall of 2002. And according to Army Desk Officer George Chavis, "The Army is ready for this product. We're gearing up for it now and we're looking forward to implementing v4.2."

Something for Everyone

While v4.2 was a hot topic of conversation (with busy demonstration tables), the Conference offered a diversity of top-



“At a very high level in the OSD [Office of the Secretary of Defense], this is a purple program and we have a very serious commitment to do things smarter ... the senior leaders in OSD are business people—they demand we embrace transformation.”

—Col. Maureen Clay, USAF
Chief, Contracting Operations
SAF/AQCK

ics—something for everyone in attendance. Tom Bayless, Director, Air Force Contracting Information Systems Program Office, opened the Conference and encouraged everyone to “learn while you’re here. Don’t reinvent the wheel... and take what you learn here back to your office and share it with your co-workers.”

Putting his words into action, Bayless created an environment—from the speakers to the breakout sessions to the networking breaks—where ideas, experiences, and lessons learned were traded and repeated across the Military Services and Defense Agencies, all of whom were represented at the Conference.

Embracing Transformation

Air Force Col. Maureen Clay, Chief, Contracting Operations, Office of the Deputy Assistant Secretary (Contracting), Assistant Secretary of the Air Force (Acquisition), kicked off the Conference and told attendees that they can expect to see “some fairly significant changes in the next three years, but I’ve sat where you are about 100 times and I know you always hear there is going to be significant change.” She estimated that only 35 percent of predicted changes actually happen, but she said the 35 percent that will happen in the next few years will make a difference.

“At a very high level in the OSD [Office of the Secretary of Defense], this is a purple program and we have a very se-

Polonsky-Hillmer is President, CorpComm, Fredericksburg, Va. She has worked with the SPS Program since its inception.

rious commitment to do things smarter,” said Clay. “The senior leaders in OSD are business people ... they demand we embrace transformation.”

Some of the transformations Clay said will be coming involve increasing use of global supplier agreements and commodity councils. Technology will help these tools evolve so they’re almost second-nature to everyday business decisions in the Pentagon, she predicted.

Transformation of Core Elements

Haynes echoed Clay’s call for transformation, but at a more specific level. “We’re transforming some core elements of the SPS program,” he said. “Specifically, at the process level, we’ve made significant changes to two processes that directly affect user satisfaction: the requirements process and the testing process.”

Haynes explained recent changes to the Joint Requirements Board that ensured every issue that is presented (whether to the Help Desk, Desk Officers, Component Management Offices, or JPMO User Satisfaction Manager) is considered as a requirement for future versions of the software. He has also hired an Independent Validation and Verification (IVV) contractor to oversee the testing process and “make sure we get what we need to make this program successful.”

One issue Haynes repeatedly emphasized was the fact that he works for SPS users. “I work for you,” he told the audience. “It’s my responsibility to put all of the resources entrusted to me by the government to use for you, the SPS users.”

Haynes mentioned several communication avenues that were in place such as the direct e-mail at spscommunications@hq.dcma.mil and the monthly SPS Newsletter at <http://home.dcma.mil/sps-jpmo/spsnewsletter>.



“SPS will help us place orders across the entire Department and collect data that will help us make smart business decisions that benefit the warfighter ... It’s truly time for us to focus as one DoD on the warfighter. We need to use less contractual vehicles and we need to use them wisely to realize discounts for the volume we purchase across the DoD.”

—Deidre Lee
Director of Defense Procurement

One of the tools about which he is particularly enthusiastic is the upcoming Center of Excellence (COE). The COE is a Web portal that provides a personalized environment to the user, allows for sharing of information between users, and would ideally tie into existing SPS sites managed by the Military Services and several contractors (including the SPS Knowledge Base). Haynes encourages users to provide feedback through sharing their thoughts and suggestions about the portal.

From the User Perspective

Viewing the demonstration of the COE, Major Command Functional Review Board member Stephen McLaren said, “This is the single most important and exciting thing the government has spent its money on in years! It’s about users feeding information into a system and helping each other.”

His comments were indicative of most users who saw the demonstration. And because of the enthusiasm of users like McLaren, Haynes said he is pursuing turning the Center into reality by mid-summer.

A New Communications Tool
Director of Defense Procurement Deidre Lee was a key participant and speaker at the Conference. Lee unveiled a new communications tool she is implementing that will encourage direct communication between her office and anyone and everyone in the procurement community.

“Let us know if a clause needs to be changed. Let us know how we can make things better. We’re asking for your input,” said Lee. “We write the FAR [Federal Acquisition Regulation] and the DFAR [Defense FAR], so we can make changes to them. We just need to know what changes you’d like us to make.”

Lee has set up an e-mail address for users to reach her office with ideas and suggestions: front-line.solutions@osd.mil. She said users who send in suggestions will definitely receive a response and may be recognized through public forums.

Lee emphasized the importance of SPS to DoD's end-to-end procurement process. "SPS will help us place orders across the entire Department and collect data that will help us make smart business decisions that benefit the warfighter ... It's truly time for us to focus as one DoD on the warfighter. We need to use less contractual vehicles and we need to use them wisely to realize discounts for the volume we purchase across the DoD."

Using SPS to Benefit the Warfighter

The theme of using SPS to benefit the warfighter could be heard throughout the Conference, especially when it came to sharing ideas of how to use the system smarter.

Carolyn Hickey came to the Conference from Elmendorf AFB, Alaska. "It took me 12 hours of airplane travel to get here," said Hickey, "but it was worth it. The exchange of ideas is very important."

"These user conferences are a good thing," agreed Dwight Brown, an Army SPS user. "It's nice to see people face-to-face. You exchange e-mails all the time and it's nice to finally see everyone in person!"

Cindy Bailey is a systems administrator for SUPSHIP in Portsmouth, Va. "I came to the Conference to get issues about v4.2 clarified. But I've learned more than just what I came for," said Bailey. "I liked talking with other users who are having the same issues I am. We shared ideas. I also enjoyed meeting Colonel Haynes. He is really on board to make this work."



"I work for you ... it's my responsibility to put all of the resources entrusted to me by the government to use for you, the SPS users."

—Col. Jake Haynes, USA
SPS Program Manager

In addition to users from the Air Force, Army, Navy, and Marines, representatives from the Defense Information Systems Agency (DISA), Missile Defense Agency (MDA), Real Estate & Facilities

Contracting Office (REFCO), Defense Intelligence Agency (DIA), Defense Logistics Agency (DLA), and Defense Finance and Accounting Service (DFAS) were also in attendance.

"SPS was the first system deployed that took all the Services' needs into consideration," said JoAnn Smith from DFAS. "I'm here to keep abreast of the issues with SPS and the Services since we in DFAS really are 'financial partners at work'—vendors come to us for payments."

Personal Message From the Director, Defense Procurement

Recognizing the importance of Defense Procurement, not only to the warfighter but to the nation at large, Director of Defense

Procurement Deidre Lee brought a personal message to this year's Conference. She thanked all procurement professionals for their "above-and-beyond" response to 9/11.

"We recognize you're doing a great job. Please take this message back with you to your Commands: *Thank you!*"

Editor's Note: For those readers interested in viewing the test portal or providing feedback to the JPMO, send an e-mail to the direct address at spscommunications@hq.dcmamail.mil requesting a PowerPoint version of the COE screens. **Polonsky-Hillmer** welcomes questions or comments on this article. Contact her at linda@corpcomm-inc.com.

A Friendly Game of SPS Family Feud, Anyone?

Conference organizers at this year's Joint Standard Procurement System (SPS) Users' Conference concluded this year's event with a lively game of "SPS Family Feud" in which teams squared off to answer questions about SPS. The winners proudly wore their prized SPS baseball caps, which were bestowed upon them by Tom Bayless, Director, Air Force Contracting Information Systems Program Office. The SPS Family Feud game, which makes an excellent training tool, is available for use by all SPS sites (using Internet Explorer). If you would like a copy, please contact Liz Gooding, SPS User Satisfaction Manager, at lgooding@hq.dcmamail.mil.



Fifth Round of Business Initiatives Formalized

The Department of Defense announced today that members of the Business Initiative Council (BIC) have approved additional sets of initiatives designed to improve business operations across the Department of Defense and enhance support to the warfighter.

Potential efficiencies focus on various requirements and processes and will positively affect proactive business applications within the DoD. Examples include support of the President's management agenda by transitioning non-core competencies to alternative sourcing arrangements via pioneer projects designed to complement the A-76 process; allowing acquisition programs to buy quantities in addition to the number documented in the budget when an advantageous unit price is achieved and there is a documented requirement for the additional quantity; establishment of a common access card for all DoD facilities and installations; and the establishment of an acquisition policy that requires, as reasonable and practicable, that all systems have an integrated set of embedded instrumentation for diagnostics, prognostics, testing, and training.

The benefits from the BIC-approved initiatives include the elimination of duplication, streamlined procedures, improved customer service/performance, reduction in manpower requirements, improved performance, enhanced training capability, and reduced down time of equipment, to name a few. This fifth round of initiatives addresses three overarching process arenas: people, corporate operations, and acquisition management.

The BIC, established and presided over by Under Secretary of Defense for Acquisition, Technology and Logistics Pete Aldridge, is composed of the military Service Secretaries and the Vice Chairman of the Joint Chiefs of Staff. The Under Secretary of Defense for Comptroller and the Under Secretary of Defense for Personnel and Readiness recently joined the BIC, bringing additional expertise to many of the initiatives the BIC is pursuing. The BIC reports directly to the Senior Executive Council, whose members include the Secretary and Deputy Secretary of Defense, the Service Secretaries, and the Under Secretary of Defense for Acquisition, Technology, and Logistics.

The BIC was launched in July 2001 to implement bureaucracy-reducing and/or money-saving opportunities in the business practices of the Department of Defense. This is core to Secretary Rumsfeld's broader "Battle on Bureaucracy" campaign, announced on Sept. 10, 2001, and complements the President's Freedom to Manage Act of 2001, introduced into the Senate on Nov. 1.

"We, on the BIC, are excited to have this tremendous opportunity to transform the way we do business and inculcate the best business practices into the DoD culture in support of the Secretary's initiative," said Aldridge.

The list of new initiatives is on the Web at <http://www.defenselink.mil/news/Jun2002/d20020604summary.pdf>.

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

Under Secretary of Defense Aldridge Media Roundtable

Hot Topics for May 2 Roundtable—Nunn-McCurdy, V-22 Osprey, Crusader

Nunn-McCurdy explanation and certification documents are available at <http://www.defenselink.mil/news/May2002/d20020502nmc.pdf>.

The first thing I'd like to go over is the Nunn-McCurdy certification. As you know, we have six programs that we have to take a look at. And the certification process has to occur by tomorrow. And I'll talk a little bit about that, because I've already made the decisions. The other is the V-22 return to flight, which we've had a meeting on recently. I'd like to talk about the missile defense program, and then the Navy DD(X). And then I'm sure you'll have some questions on Crusader.

Nunn-McCurdy Certification of Six Programs

As you know, when we have a Nunn-McCurdy breach of 15 percent, we have to notify Congress. When we have a Nunn-McCurdy breach of 25 percent, we have to notify Congress, and then the Secretary of Defense has to certify to four criteria for the program to continue. The Secretary has delegated that certification process to me—as the Under Secretary for Acquisition, Technology and Logistics.

The four criteria we have to certify are:

- One: *Is the program essential for national security?*
- The second criteria: *Is there an equally capable alternative of lesser cost available?*



Crusader
Image courtesy United Defense



LPD-17, USS San Antonio
DoD Image

- The third criteria: *Is cost under control?*
- And the fourth criteria: *Is there management in place to keep the costs under control?*

If you cannot certify to those four criteria on a specific date, then the fund obligation stops, which is what happened on Navy Area [sea-based missile system].

In accordance with this law, and based upon the schedule that's been given for these six programs, I must sign that certification letter to Congress by May 3rd. There's been a huge amount of work done by the program offices, by the military departments, and the OSD staff since the congressional notification occurred. And because of all this work of getting the programs back on track, I

Edward C. "Pete" Aldridge Jr., is Under Secretary of Defense (Acquisition, Technology and Logistics).



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

DoD photo by Navy Petty Officer 3rd Class Jason A. Pylarinos



An ATACMS missile is fired from the Multiple Launch Rocket System (MLRS) M270 weapons platform.

Photo courtesy Lockheed Martin Missiles and Fire Control—Dallas



F-22 Raptor

Photo courtesy The Boeing Company

am able to certify that each of the six programs now *do* satisfy the four criteria for continuation. And I signed the certification letter to this effect to Congress today.

Let me just go through, very briefly, some of the programs and the reasons that I felt confident about certification.

H-1 Helicopter

One was the H-1 helicopter. We're re-manufacturing 280 H-1s for the AH-1 Cobra and for the UH-1 Huey, replacements. Based upon my review of the management team, we're now using the OSD [Office of the Secretary of Defense] cost estimates. In fact, the Navy and OSD cost estimates were consistent with each other. And if you look at the alternatives, the alternatives are much

more expensive than continuing with the current re-manufacturing effort.

CH-47 Helicopter

The CH-47 helicopter. We're going to re-manufacture 317 CH-47s for the heavy lift helicopter replacement. Every alternative was two to three times more expensive. The CAIG [Cost Analysis Improvement Group] estimates are now being used. And looking at the management team we have in place at Boeing, we have confidence that they could pull off the job.

LPD-17

The LPD-17 amphibious transport dock ship—there are four ships under contract leading to a 12-ship buy. Ninety-five percent of the design has been completed. Most of the problems are behind us. They are also using the CAIG cost

estimate. So it looks like we've got costs under control.

Chemical Demilitarization Program

The chemical demilitarization program—this is the destruction of chemical weapons per our treaty. There is really no alternative to this approach; [there are] various technologies on how to do that, which we are looking at. And even though the program is in place, we are looking at an alternative to accelerate the process, to see if we can get rid of some of the stuff quicker. We are using the CAIG estimates for cost and schedule.

MLRS Upgrades

The Multiple Launch Rocket System [MLRS] upgrades—this improves the launcher, develops a GPS [Global Positioning System]-guided Multiple Launch Rocket System, and extends the range. This is a joint program between Germany, Italy, France, and the UK. We have new cost estimates and a reasonable production profile, and the contractor is now achieving good cost performance.

SBIRS High

The last of the six is the Space-Based Infrared Radar System [SBIRS High]. This is the high version. This is the replacement for the current ballistic missile early-warning system, with the added requirements for technical intelligence and missile defense. This is essential for national security. The alternatives were much more expensive given the state of the current program. We are again using CAIG cost estimates, and there's a new management structure in Lockheed Martin and Northrop Grumman that gives me the confidence that we could pull this off.

So those are the six. They have been certified, and I think for good reason. Again, a lot of work went into making those happen.

V-22 Return to Flight Status

On April 25th, the Secretary of the Navy, the Commandant [of the Marine Corps] and I met to review the return to flight status for the V-22. The program manager, Dan Schultz, and his team, with a

lot of additional help, have put together a comprehensive flight test program that will prove—or not—the reliability, safety, and operational suitability of the V-22. And I said before, this will be an event-driven test program, not a schedule-driven program. I concurred in the Navy's plan to reinstate the V-22 flight test program. And I think the first flight plan is for May 9th.

I looked thoroughly at this program. Some of the issues that I had with the hover and high rate of descent performance are going to be addressed within the first nine months of the flight test program, even though it will start off very carefully and deliberately.



Missile Defense

As a result of many of the problems of SBIRS-Low last year, I asked the Missile Defense Agency to look into a restructured program. This has now been completed. And [Lt. Gen. Ronald T. Kadish, Director, Missile Defense Agency] has briefed a summary of the plan to the Hill several weeks ago.

Generally—and let me summarize it—we're going to form a joint contractor team of TRW and Spectrum Astro, the former competitors. TRW will act as the prime for the spacecraft design and development, and

Spectrum Astro has agreed to this arrangement.

We'll compete the payload between Northrop Grumman and Raytheon. We're going to implement spiral development, evolving the spacecraft capability with time. And by doing this, starting off with a little slower pace, I believe we can plan for the first increment to be launched in the 2006 to 2007 time-frame. We will ask Congress, through reprogramming, for an additional \$13.4 million in FY '02. As you recall, in the appropriations process there was \$250 million left in the program. We're finding that's just a little bit short for what a restructured program would be, and we'll ask Congress for the reprogram. It will come from a missile defense program element itself. And to avoid a lot

of confusion between SBIRS-Low and SBIRS-High, I'm going to ask General Kadish to give me another name for SBIRS-Low. That will probably save a lot of time and effort.

As you may recall also, we terminated the Navy Area Terminal Defense System last December. I asked the Missile Defense Agency to develop a replacement program to account for the new missile defense technologies. That work is also completed. I've been briefed on it. We have—based on the briefing and the information I got from General Kadish—decided not to start a new Navy Termini-

nal Defense System. We found that through improvements in the Navy Mid-course System—the so-called Upper Tier, which is performing quite well—and some improvements in the existing

Block 4 Standard Missile, we can achieve much of the capabilities lost as a result of the removal of Navy Area. And certainly, we do not need any more pressure on our budget resulting from a new

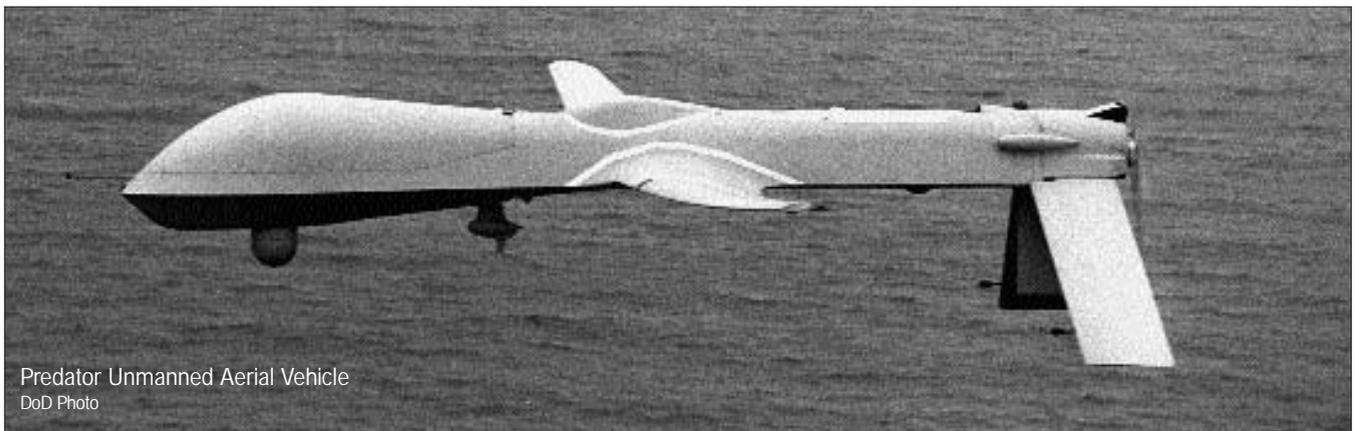
start. So we're not going to pursue that plan.

On Monday, the Assistant Secretary of the Navy, John Young, announced the source selection for the Navy's new DD(X). I'd like to congratulate the Navy and the Gold Team of Northrop Grumman and Raytheon for an excellent design and a winning proposal. The award of the DD(X) design agent contract marks an excellent beginning for a new family of surface combatants for littoral operations, land attack, and air and missile defense capabilities. This program is evolutionary in its final development approach; [it] will be a model for Navy acquisition in the years to come. It will bring transformational capability to the fleet, as well as the acquisition process. This is a great new program for the Navy, and I wish them well.

Questions?



RAH-66 Comanche aircraft.
Photo courtesy The Boeing Company



Predator Unmanned Aerial Vehicle
DoD Photo



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

Q Mr. Secretary, as the V-22 starts flight testing again, what standard are you going to use for deciding if you should cancel the program? If there's a crash, is that program dead?

A Not necessarily. It could be pilot error. We'd have to go into it and determine. As you know, there are really just three criteria that we're looking for [in] the V-22: reliability, safety, and operational suitability. Operational suitability, of course, is a wide range of things: Will it operate well off of the deck of a ship? Does it have any landing-zone consid-

erations, like dust and debris? Can it be dangerous to fly in that kind of environment? Is the performance what we expect it to be? As has been demonstrated, there are some problems in going through [these issues].

If you read the blue-ribbon report and the independent NASA [National Aeronautics and Space Administration] study, which I have [read] thoroughly, you'll find [there are] many recommendations in there to take a look at some things like, do you need more control authority? Some of the hover performance that was predicted, versus what was actually achieved, was different. I'd like to know why that occurred. Is something wrong with aerodynamics determination? The prop loading is very high on the V-22, which doesn't give it a lot of maneuverability margin. We need to check that out. We've all talked about the vortexing-state conditions that occur with these rotors, especially when they're out on 20-foot Moment Arms.

All those things are going to be checked very thoroughly. The flight-test plan looks very good to me. I was worried that they were going to put the hard stuff at the end. They're not. They're going to bring it up. It's going to be about nine months. They'll have some of the high-rate-of-descent activities, as well as some of the hover performance, which is that uncertainty that I mentioned. So I think the program is well laid out. Again, it's not schedule-driven; it's event-driven. And I think, based upon the comments of the program manager, [in whom] I have very high confidence—I think we're going to get a good program. It's going to prove itself one way or the other.

Q *But you remain skeptical about the aerodynamics of tilt-rotor technology, generally?*

A Yes. I think there's a lot of uncertainty we don't yet know about. Yes, and—but I'm a lone soul here—in some cases, the flight-test program is going to prove or disprove whether or not my concerns

are valid. And the Commandant of the Marine Corps now concurs. He's going to watch that [Osprey testing]. And we're still looking at alternatives, just to make sure.

Q *Using as a baseline the transformation and the availability or lack of availability of dollars, [I have a] two-part question: One, has the Pentagon—yourself included—decided to cancel the Crusader program? We're not talking about friends on the Hill and what the Army may be doing, but has DoD made that decision?*

And based not on the flight-testing of the V-22, but again, on transformation and costs and dollars available, what about the programs such as the V-22, the F-22, the Comanche, and the Joint Strike Fighter? Are they in doubt? Are they firm? How would you categorize [the situation]?

A Let me stop [and] back up a little bit. All these things have come to the [forefront] because we're in the process of trying to publish a *Defense Planning Guidance*. We're trying to get it out this week. It probably won't make it this week. Maybe [we] can get it out on Monday, but when the Secretary goes through the planning guidance and [is] looking (we're preparing for the FY '04 through '09 budget), he's [typically] asked a lot of questions about things like this. I mean, when you look at the budget: Are all these things affordable? Are they the right priorities? We've listed a series of things we want to look at. And Comanche is one of them, and F-22 is one of them. And we make sure that we have an alternative available to the V-22. If we have a problem with V-22, we don't want to be sitting around for another two years figuring out what to do if the V-22 isn't [suitable], because the Marines need a modernized helicopter.

Q *Joint Strike Fighter?*

A Joint Strike Fighter is certainly one of those. You know, the Navy, Marine Corps have done a study. They've put

that in. We've asked for some [and are] looking at alternatives, [as] to what is the right mix of those because we haven't made up our mind exactly. All these issues are now put on the table for study. And that's what we've done. We've asked the Army, we've asked the Air Force, we've asked the Navy to come in with studies at various dates, [for example], "Here are some alternatives—and we'd like for you to look at this alternative or that alternative." In some cases, we just say, "Give us a plan, we don't have an alternative."

Tankers. We need to replace tankers. The Air Force has been asked, "Give us a plan for how we're going to do tankers." These are the kinds of things that we're looking at, and they have been put on the table. And certainly we've asked the Army to look at an alternative; if you didn't have Crusader, what would you do, if that's the case? It's a plan. Give us a plan under these conditions.

No decision has been made because we haven't seen the results of the studies, and they have not been briefed for the Secretary [nor] the Deputy Secretary. And certainly they will go into the budget planning process when we see the studies relative to the other priorities. So, no, we haven't made any decisions.

Q *Just a follow-up. We have been led to believe, I assume perhaps incorrectly, that at least some of these programs were locked in concrete and were going forward, particularly the F-22 for the Air Force, which has stated that they [the Air Force] must have it. Of course, we know the Marines want the V-22; they desperately say they've got to have something to replace the aging C-46s and what have you. But now we see these programs are not locked in concrete—that there is a new view, perhaps. Has there been a substantive change in the way these things are being addressed?*

A Well, I don't think you could find any program locked in concrete. I would imagine you would go back and look at the CH-47 and the H-1 and LPD-17, and somebody would say those were locked

in concrete in the past. If it's not performing, it is certainly not locked in concrete, in my view. If we find that there are better ways to do something, I'm prepared to advise the Secretary of Defense that there are better ways to do things and different priorities. And I think we have to. I mean, we owe the American taxpayer this—to provide as much use for the taxpayers' dollars as we can get. And I don't think there is any program that should be considered locked in concrete, unless you want to consider the Pentagon. This is probably the only place that's BRAC [Base Realignment and Closure]-proof at this point.

Q
A last follow-up, if I may.

A
Yes.

Q
But the F-22—are you saying in so many words it's not performing up to your desirability or others'? That has been viewed, at least by the Air Force, as an absolute "must" to replace the F-15.

A
I think the Air Force view is exactly the view that they have had. The issue we have here is, are we buying the right number of aircraft? Given [the fact that] now the Joint Strike Fighter is underway, given the fact that we've got the F-18, [and given the fact that we've] been looking at the Navy's mix, to me everything is on the table to take a look at the balance—how many we're going to buy. Maybe we're not buying enough. In the study, we're looking at alternatives to include increases in the F-22 if that's the right [course of action].

Q
To make sure that I'm not shorthanding your views inaccurately, my reading of your previous remarks was that it [the Osprey] could be fundamentally and fatally flawed. That's one question.

The second, related question is, are you familiar with the IDA [Institute for Defense Analyses] report, and what did you think of it? It's out.

The situation is that the world changes. Things happen, and we are taking a look at spending our taxpayer dollars in the right way.

A
I was briefed on the IDA report. Some of the concerns that they had are some of the ones I had. Some of the concerns that were in the blue ribbon panel report, I had. Some of the concerns that were in the independent report, I had. There are many recommendations from those studies to go out and look at other things. They highlighted this hover performance anomaly; what's the difference between predicted and achievable? We have not done a lot of the test of the V-22 in combat maneuvering—you know, close to the ground, you're in a dangerous area, and you've got to get out—we haven't done any of that. We haven't really done a lot of landing and testing in sand and snow and debris. We haven't flown the envelope of this aircraft to various points. We haven't determined where we get into this vortex ring state problem thoroughly. I could just go on. We haven't done a lot of testing on shipboard capability.

Q
What's the Aldridge opinion of the V-22 at this moment?

A
If it performs as predicted—reliably, safely, and operationally suitable, under all those conditions we've outlined—then it has a transformational capability for the Marine Corps.

Q
But didn't you have some doubts previously? It seemed to come through that way. Would "skeptical" be the right word?

A
Yes. I continue to be skeptical until they prove to me those three things.

Q
But you don't think it's fundamentally flawed?

A
I don't see it as fundamentally flawed at this point. I will keep an open mind because there are some things that it does in certain performance [areas] that tell me it's close to being marginal, and that is, for example, maneuverability at low speed. So I'm just going to look—I can't sit out here and make a judgment that I believe [the Osprey] is fundamentally flawed. I think there are some problems with the V-22, and the best way to find those out is to put it back in the flight test program and wring it out. If it's successful, I will give it full blessing; it will go because it does have good performance [and] if it does the things we want it to do.

Q
Those tests you mentioned—why weren't they done earlier?

A
I wasn't here at the time. I can't tell you. Although, as you know, there was a lot of concern about the hiding of some test results within the Marine Corps.

Q
Don't you think this is being pushed through too quickly without having the adequate tests?

A
It is likely, [there] had been a little more optimism about its performance.

Q
Mr. Secretary?

A
Yes, please.

Q
Back to the Crusader for a minute. Secretary Rumsfeld said today that it's his intention—and that's the word he used, intention—to cancel the program, although

a final decision hadn't been made. Now, in your view, is it appropriate for the Army to continue to solicit support for the program on the Hill, knowing that the Secretary intends to cancel it?

A I did not hear the Secretary's press conference, so I don't know what he said there. So I'm assuming that you're right.

I think the Army should really be quite objective in this process, and we've asked the Army to come in with a plan that cancels the Crusader. We will see what it looks like, and let the Secretary make up his mind as to what are the priorities for this Department. And to be on the Hill lobbying for a different approach, I think, is probably not appropriate.

Q A follow-up. Did you see the talking points they put out? The opening line said, "A cancellation would put soldiers at risk."

A Let me just not comment on that, okay?

Q Why?

A Because I think it's something that the Army should comment on. I didn't write it, so let them comment.

Q Going back to DPG [Defense Planning Guidance]. The DPG will have, when it's final, a notice to the Army to come back in 30 days with a program that cancels the Crusader and looks at alternate programs like the Excalibur. Is that accurate?

A I don't like to comment about what's in classified documents. Let me just say it in a very general sense. The Army has been tasked to come in with a plan that would include the cancellation of Crusader within 30 days, with a description of what the concept would look like with a lot of different variables in it. They've been asked to do that; Secretary White's agreed to do that. We'll come back, we'll brief the Deputy Sec-

retary in 30 days, and then we'll make a decision—is this the right plan, or it may not be the right plan. It may have some warts on it. It may not be right. It may be that it's the wrong way to go. We're allowing the Army to tell us if that is in fact the case, being as objective as possible, to include participation by my office and PA&E [Program Analysis & Evaluation] in this process, so we have a basis for an analytical judgment based upon rational and objective criteria.

Q On SBIRS-High, can you give us some of the details about the changes made that have gotten it under control? Does any of it have to do with losing any capabilities?

A No. As part of the criteria I had to look at alternatives to see if there were any cheaper, better alternatives. And we did so. We found that there were none. Given where we were in the SBIRS-High, there were none that would give me the confidence that I would pick the alternative, versus the plan that had been put into SBIRS-High.

What gave me the confidence was that I think the contractor realized that the performance and the management approach that he was taking for SBIRS-High needed some serious adjustment, and he took those measures to make that happen.

The other one is that we've looked at the cost estimates for the future; using our independent group, they came to a conclusion that the costs obviously were wrong that we were using. The Air Force agreed to use the independent cost in their future [estimates], so the issue of cost uncertainty went away to the best we can [tell]. Clearly, something could happen tomorrow afternoon and blow up the thing. But given our best estimates, the schedule and the cost estimates that were being used by the Air Force are what we think OSD and the independent group said [they were].

The Joint Chiefs of Staff—in fact, General Myers—came on very strongly that this was essential for national security

to have this capability as defined by the baseline SBIRS-High. So we left that program, in terms of its requirements, alone. We redid the costs, redid the schedule. The new management scheme's in place, and I think the message to the prime contractors, which are Lockheed Martin and Northrop Grumman, is that they're in a spotlight. And if we find that six months from now the program is going south, I'll have no hesitation to pull the plug.

Q Can you just give us generally some of the management differences now versus before?

A Some of the cost earned-value management systems have been put in place. More senior leadership has been put in place at Sunnyvale and within Northrop Grumman. I think the management attention given to the program with Vance Coffman (Lockheed Martin) and Kent Kresa [Northrop Grumman] [is] basically [in the form of] signing up that they will support and defend this program and make it happen properly.

Q You mentioned changing the name on SBIRS-Low. Is that a big deal? What kind of problems have you encountered?

A [It's] probably just [a matter of] changing the stationery.

Q Sir, could you tell us, in your own words, what the problems are that you all see with Crusader? And could you also go through the Nunn-McCurdy list and give us the new cost estimates, and if you have them, what the changes [are] from the old set?

A They're in a letter that I sent to the Congress. I probably ought to pass it out. Yes, the unit costs increase. Yes, they're all spelled out in the letter to the Congress, to the various committees on the Hill. And what was the other question?

Q Crusader—your concerns with Crusader:

A Again, it's not a decision to kill the program at this point. It's going to be reviewed. The concern—let me just give you kind of a gross concern. The battlefield of the future is going to be represented by very precise target location, digital terrain mapping, and very precision weapons delivery. If you look at what is the best way in the future to achieve a capability for the Army that's in the [warfighter's] best interest, it is providing the Army with a quicker pace to achieve the technologies that are associated with this type of battlefield environment; get precision weapons to the Army faster; and get the Army moving toward more mobility, lethality, [and] deployability, which is what they're doing on the future combat systems.

If you then say to yourself, "What is the Army doing relative to moving toward that new battlefield?"—[in view of the fact that] there's a \$9 billion bill to pay for Crusader. And if you think about it, you say, "Well, \$9 billion is taking money away from things that could be used to get the Army toward more precision, more lethality, more mobility, more deployability." And so there's a question raised: What should be the priority? Should the priority [be] for Crusader to "go" [at a cost of \$9 billion], or [should that] \$9 billion [be used] to move the Army toward this new technology at a faster pace.

The Secretary of Defense has to balance those two questions. He's asked the Army to provide that balance for him. "Tell me what we can do." An example [would be], could we build the Excalibur—which is a long-range, high precision weapon—quicker by taking some of the Crusader money to do that? And the Secretary of Defense has a legitimate question. And what we have done is say, "This appears to be attractive. Let's go take a look at it ... and come back and tell us what you think."

Q Yes, I have a question about Navy Area. In a similar roundtable here a few months ago, after its cancellation, you said that you could certify that it was a valid requirement for

I think the [Osprey] program is well laid out. Again, it's not schedule-driven; it's event-driven. And I think, based upon the comments of the program manager, [in whom] I have very high confidence—I think we're going to get a good program. It's going to prove itself one way or the other.

national security, but the cost and management were more problematic. But now, with it not being revived—I mean, Navy Theater Wide can't really do what Navy Area did—are you saying the requirement perhaps isn't as important as it would seem before, or simply that it's not cost-effective?

A The Navy Area was designed for the shorter-range missiles—a terminal defense against a shorter-range missile. The Navy Midcourse System is against longer-range missiles. The Missile Defense Agency has looked at these programs and has determined that they can bring the Navy Midcourse System down to a lower intercept altitude and begin to fill in the shorter-range missiles.

The other look is to take the basic standard—the Block 4 missile—[and] see if we can do something, for example, fusing or some other things, to move its capability up, so that there may be some options to substitute for a single system associated with this block and to do it

with multiple capabilities and looking at new kill probabilities.

The other issue is whether or not you really believe the scenario is that valid that we would start a brand-new program. [The scenario is] we will never be able to put [in place] a land-based missile defense system to protect a base [or] a port, other than sea-based only. And [once you] begin looking at all of those [drawbacks], it appears [reasonable] to explore this option of expanding what we've got with a program that looks pretty good—expanding its envelope to shorter-range missiles, and seeing if this is a better solution than starting a brand-new program that obviously puts a lot of pressure on the budget.

Q Mr. Secretary, can you clarify something about the timing of your Nunn-McCurdy certifications? You said that—speaking SBIRS-High—that six months from now, if you find the program's going south, you'll have no hesitancy to pull the plug. Does that mean that you do these certifications in the case of 25 percent use overruns every six months, or what is the timetable?

A At any point during these programs, if the program manager sees—based upon the selected acquisition report submission—that these unit costs are going up, they have to notify [my office] or notify the Congress and let us know that within a certain period of time, I have to re-certify. So that's an ongoing process, but I think it's triggered by the selected acquisition reports that come in.

Q So how come this is the first [Nunn-McCurdy certification] with the Navy Area?

A [Are you asking] why was it the first time?

Q Yes.

A I think we actually found another possible case (we're exploring where it hap-

pened in 1993. But I don't know whether people just rubber-stamped [these programs]. I wasn't here at the time, so I can't say. That's not my method, however. I will not sign my name at the bottom of something that I don't believe.

Q
Mr. Secretary, you used the term "family of ships" for DD(X).

A
Yes.

Q
In the past, you, and I think Comptroller Zerkheim, have referred to it as an R&D [research and development] project, and it created heartburn for the Navy, though, which desperately wants to build the ship. So are you now looking at this as the beginning of this "family of ships" the Navy wants?

A
I don't find the Navy has any heartburn with this program.

Q
No, I mean they had heartburn over the way it was being viewed by some of the higher levels in the [Pentagon] because it was being referred to as an R&D project.

A
They may have. The first ship will be an R&D—built with R&D funds. That's somewhat unusual. But in my view, it is a family of ships. I absolutely support what the Navy is doing in DD(X). In fact, I think the concept [was] derived sitting in a meeting with the CNO [Chief of Naval Operations] and the Secretary of the Navy and me in his dining room, that we [first considered] DDX—[that] DD-21 was too narrowly focused for where the Navy was going in the future and that a much broader range of capabilities [was needed], starting with the technologies that are quite good with the new radar and the stealth design, and robotics, and gun systems and propulsion; and all that starting with R&D, but essentially branching out to the cruiser, to littoral ships, and to some type of destroyer. So I fully support what the Navy is doing—and think they've got a great program.

Q
Mr. Secretary, can you say whether or not the experience in Afghanistan was a factor in the battlefield of the future that you describe in weighing the Army's look at Crusader?

A
I'm not sure that would apply to a specific program. I think the battle in Afghanistan clearly pointed out the value of integration of information technology, [and] the role of the soldier on the ground. I mean, lots of lessons learned. But I think the value was the integration of all this information and how we could play it together from the point of view of the overhead space capabilities to JSTARS [Joint Surveillance Target Attack Radar System], to gunships, to Predators, to P-3s—all those things working together that were integrated. That was kind of a surprise to us all—how well that was working.

Q
Yes, sir, back to the F-22. There have been reports in the media recently that that program is high on your chopping block (the Pentagon's chopping block), and also reports about structural problems. Could you describe that? Is that program in trouble?

A
I think the program is—from the point of view of the technical [aspect]—making some progress. The test program is going a little slower than we would like. There have been reports of a structural problem, and we were told about that, I think, back in December. It doesn't bother me, because the reason you do tests is [to] find [the] problems.

But it's a load problem on the fin at a particular point. It's a very narrow point in the flight test program. It doesn't bother me because there's plenty of mitigation things that we can work on. That's why you do flight tests. We'll find out about it and we'll correct it.

The program—the F-22 program—to me, is not in trouble in the sense that it's likely to be cancelled anytime soon. We just started it into low rate initial production. I think what we're looking

at [as far as] any alternatives is to [determine] the size of the program that we're going to deploy eventually.

Q
A couple months ago you asked [that] a series of studies be conducted looking at the industrial base in the helicopter industry. Those have been completed, and I think you were briefed on that. What were the conclusions of those studies? And I think some of the studies looked at how possible cancellations play out in terms of ramifications on the industrial base. Were these factors in your decision to recertify things like H-1 and the Chinook, and also the V-22 going forward now?

A
No. The studies concluded that we don't have as much competition in the helicopter industry as we would like, and that because of that, we are not innovative enough. And it's causing me to start thinking out how we can be a little more competitive in the helicopter [industry]. Can we do something to be a little more competitive, and for some time in the future should we be looking at new R&D programs for heavy lift? So we're beginning to think about what we can do in this industry that is essentially defined as three—Bell, Boeing, and Sikorsky—all interconnected together in some way, shape, or form. And I don't like that.

Q
Is it also not the case that it's uncompetitive because a lot of these programs are re-manufacture programs—H-1, CH-47—and they're all going back to the original manufacturer?

A
That's right.

Q
How do you break out of that cycle?

A
You have to start thinking about that now—that you'll break out of it maybe in 10 or 15 years from now.

Q
Yes, sir. There have been about a dozen alternative studies for the F-22. Has some-

thing changed? Is there some new alternative to the F-22 that's being looked at or are they the same old alternatives?

A
I'm not sure [what you mean].

Q
Remanufactured F-15s, beefed up.

A
Those are not in the equation. The only thing that's in the equation today is how many F-22s are we going to buy? We have not thought about opening up alternatives of that nature.

Q
But the reason you're evaluating how many you're going to buy—is that capability being offset in some way? Is something else doing that job? That's what I don't understand.

A
No. The situation is that the world changes. Things happen, and we are taking a look at spending our taxpayer dollars in the right way. A year or two ago—more than year or two ago, several years ago—there was a study done that said you probably need 700 F-22s, because we're going to replace the F-15s on a one-to-one basis. That number got changed—"Well, we don't need that many." The QDR [Quadrennial Defense Review] of 1997 says we only need 331 or something of that nature. Now we're saying, "Well, now we've started the Joint Strike Fighter. It's got stealth capability, [and has] some air-to-air capability. Do we need all 331?" And I [must decide] what is the right number, given the new environment, given the new priorities, given the fact that we've got a budget that looks pretty good, in terms of its current projection, but is it going to be the same as you go out in the future?

And we've started a lot of [programs] that have a huge bow-wave effect. Are we spending our money right, given the fact that we may not have the same amount of funding in four or five years from now. So I think this is what's in the equation. It's just, try to recycle.

I don't think there is any program that should be considered locked in concrete, unless you want to consider the Pentagon. This is probably the only place that's BRAC [Base Realignment and Closure]-proof at this point.

Q
Mr. Secretary, a question on spectrum allocation: There's been some criticism that it hasn't been considered enough in developing new weapon systems. Can you respond to that? And what's being done to give greater consideration to it?

A
Spectrum is important, but this is outside of my area. That belongs to John Stenbit.

Q
But it's part of acquisition, though. It's something you have to take into consideration.

A
Yes, we have to take into account the spectrum process, but [as] I've already said, that's John Stenbit's expertise. I've got enough to do, to tell you honestly.

Q
You mentioned tankers before. And as you know, there's been concerns raised in Congress about the leasing of tankers, as opposed to direct purchase. Can you talk about what benefit you see in some cases of the leasing versus direct purchasing and if the cost of the lease field exceeds that of the direct purchase? In your analysis, would you "nix" the tanker deal?

A
Leasing will always exceed the purchase—if you've ever leased a car, you know the answer to this question. If we're going to have a tanker, and it's going to last 30 years, it is much better for us to go buy it than it is to lease it. But the advantage is essentially what happens in any corporation; it's called cash flow. We can get by with a lot less money for leasing [an airplane] today than we would if we went out and purchased it. And what happens is that after a period of 12, 14 years, the lease cost will start to exceed—will certainly start to exceed—what you would've paid for the same airplane. But you can get by and buy that capability much sooner. You can get it in a few years, and without a huge amount of investment.

And what the Air Force has to do is trade those two things off. They have cash flow problems and other things. And of course then the other issue we have to address is [that] Congress says after a period of lease, you have to give [the leased item] back to the contractor. Well, there's not a whole lot of commercial application for tankers at this point, so why would you do that? And why would the company want to do that? I think what they're hoping for is that they'll get a lease and they'll continue on for 20, 30 years, which is a good deal for the company. It's not such a good deal from a total point of view for the DoD.

Q
On the H-1 program, I believe you said that the reason you're continuing is the alternatives would be more costly. Is that the only reason?

A
No.

Q
What alternatives would there be?

A
There's two. The H-1 has two versions. One's the Huey version; the other's the Cobra. And what they're doing is they're remanufacturing the back end to have those two aircraft, through the engines and the rotors and tail rotors, to be com-

mon. So there's a great logistics benefit from having commonality of the two approaches.

From a utility point of view, you could do the H-60s. They're a little more expensive, but you could do that. But from an attack version, the only other option for attack is Apache, which is, I think, twice as expensive as the Cobra.

So then you put into the kitty that, "Well, if I do a utility version over here, and I do the attack version, then I'm not going to get the same logistics support and the economies of scale." So if you put all those together, it is better for us to go down the combined path.

And we did put in a new management system, a new systems engineering capability at Bell for this program, and it looks like a whole new management structure. As a matter of fact, I think 12 of their top people have been replaced.

Q *Mr. Secretary, one of the reasons for going forward with the DD(X) program and the CVX program is that the fleet as we know it in surface ships has not reached the end of its survivability concept with current design. Given that, how would you view the future of the aircraft carriers as we know them?*

A I think anybody who challenges the value of the aircraft carrier has to go to Afghanistan and look at what value it was. I think the Defense Science Board just finished a study of the carrier—of the future of the carrier. I have not seen that yet. In fact, I asked for them to do that study for lots of the reasons you just mentioned. Where is the carrier going?

But from the point of view of the kind of capabilities you can get from air-delivered weapons off of the decks of the carrier, it has to be pretty well demonstrated in Afghanistan.

Now, for the future, if we get the Joint Strike Fighter—the STOVL [Short Take-Off & Vertical Landing] version works well—maybe the future carrier doesn't have an arresting wire for landings. And

any large-deck ship becomes essentially an aircraft-deliverable system.

So I have an open mind about the future of the carrier. I think there is value to it, but we have to put all that into how long it takes, how much it costs, what are our alternatives, and so forth. So right now, I don't have a real answer.

Q *A quick follow-up. The survivability aspect of it. I mean, will [future aircraft carriers] carry a battle group? As you see it, [will battle groups] protect a carrier into the short-term future, as you see the threat?*

A I believe that's the case. Again, you have to figure out the threat you're trying to [counter], but [also to be considered] are [things like] getting into littoral areas, the role of ballistic missiles, and high-speed cruise missiles. But the studies I've seen of aircraft carrier survivability really give it a very high [probability].

Q *Sir, earlier on the Osprey you said there had been a lot of concern about hiding of some test results. Do you think that the companies held back test results from the Defense Department, or what are you saying?*

A I wasn't here, so I'm reading what I know about it more in the press—that there were those in the Marine Corps who suppressed some of the data about reliability and safety because it didn't make the airplane look good. And that's what I was speaking of.

Q *The guys at the squadron?*

A Yes. In fact, they placed their careers at risk because they wanted to show the airplane to be performing better than it actually did. So that was what I was speaking of.

Q *Can we ask you to step back from these questions for half a minute—how do you get a weapon cancelled in this town?*

A It's very hard.

Q *I mean, they're already at battle stations on the Crusader. If you want to cancel "weapon X," do you have any magic bullets? We've had two Secretaries of Defense that tried to cancel the V-22; they got "rolled." Is there any new technique you've got in mind to get this thing cancelled?*

A It is the hardest thing to do—to take a weapon out of a program [and] out of the budget. It is just so easy to put one in. I could just as easily tell the Missile Defense Agency, "Go do a new Navy Area." Nobody would have questioned that one second. And we would be spending hundreds of millions of dollars and nobody would ever have said a word.

But take one away? Well, we did the Navy Area. They [acted as though] we had killed somebody. And even restructuring a program like SBIRS-Low; we caught hell over that. It's just hard—it really is.

Q *How are you going to get it done?*

A In Navy Area I did. Nunn-McCurdy is a good tool. If a program is sick, it's going to run into a Nunn-McCurdy problem, and so there's a tool available. The tool is available during the budget process. Some of these, in the DPG we could have written, "Terminate this and terminate that," and it would have happened. But it is very hard.

Q *I just had a clarification and a question. The clarification is on the F-22. You said you were informed of the structural problem around December [2001]. Was that before or after the Defense Acquisition Board? And then the question is, the SBIRS-High, is the schedule slipped down?*

A The schedule has been adjusted. What we've done with SBIRS-High is that independent estimates have come in and

said the schedule looks very aggressive, so we've adjusted the cost and the schedule to be a little more executable. But I have let the Air Force say if they believe they can accelerate the schedule within the dollars that are provided, [so] they're authorized to do so. Why not? I mean, if we can get things up earlier, that's great. But we have put together what I believe is an executable program with a schedule that is somewhat relaxed, [with a] higher probability of being achieved; if the program managers feel comfortable [accelerating the schedule], [they] may be able to move some of that up within the dollars. They can do so.

Q

Sir, the Block 4-A missile that went away along with Navy Area ...

A

It's the Block 4 missile, not the Block 4-A. It's an air defense capability. It doesn't have as good a kill probability as the Block 4-A, but we think we can do some things to get the kill probability up. And if we can do that, it will absorb a lot of the shorter-range capability that was lost. There's a lot more work to be done in this area.

Q

In addition to the extended AAW [air-to-air weapons] mission, if you take that on as well?

A

Yes.

Q

The Chinook. What alternatives did you look at? And what did you ask Boeing to change in the program?

A

For what?

Q

For Chinook.

A

For CH-47? Yes, I've got so many things running in my mind about the Chinook. One, we did the CAIG estimate for the cost. Boeing's program description [and] their management were pretty good, so

If I want to tell somebody that I have properly priced the program, I have a tool, and I'm going to use that tool. It's called CAIG [Cost Analysis Improvement Group].

we didn't have much to do [on] that one. I think the main thing was the cost. We adjusted the cost number to take the CAIG estimate. And that's what brought the confidence that they could deliver the airplane. And of course, we looked at the alternative, which was a heavy-lift helicopter. The only solution was the CH-53, which is about two or three times more expensive than the Chinook. So the alternatives didn't look attractive. Basically we need a heavy-lift helicopter. And as long as the costs now would come under control, I was pretty confident that Boeing was going to bring [it] in—the management schemes they've got at Boeing looked pretty good to me.

Q

You referred earlier to the battlefield of the future. Can you just talk in general about the role of UAVs [Unmanned Aerial Vehicles] on that battlefield, and then in particular about the specific programs in the Services for UAVs? How are they going? And how much money do you expect those [programs to cost]?

A

UAVs are getting a lot of attention. In Afghanistan they're pretty much battle-proven now. Some of those who were skeptical about the value of UAVs have gone away. The Services have a wide variety of UAVs, from the Army's Shadow to the Predator, to the Global Hawk.

DARPA [Defense Advanced Research Projects Agency] has two programs underway—one for the Air Force and one for the Navy: new UCAVs [Unmanned Combat Aerial Vehicles]. DARPA also has some work going in micro-UAVs. I mean, everybody's got a UAV concept going now. The Navy at one time had a UAV helicopter called Fire Scout. That was terminated. But there are new technologies going. In fact, one of the things that looks very attractive is this new Canard roto-wing concept that the Navy has for a vertical takeoff and lift. But once it gets rolling, it actually goes jet speed. So it has speed and vertical takeoff and landing. It's very attractive as a potential UAV candidate.

I went to the Singapore Air Show as a guest of the Singapore Government and looked at the displays in all these foreign countries. Everybody has a UAV—everybody.

Q

[What's being done] as far as ramping up on the UAVs across the board?

A

Yes, we're accelerating Predator and Global Hawk, making sure Global Hawk has improved power and sensors. Basically, Global Hawk's going to replace the U-2. One day, that'll be about the same capability.

Q

And finally on UCAVs, Senator [John] Warner a couple of years back talked about [how] a third of combat aircraft can be replaced with UCAVs. I mean, do you think that's a possibility over the next decade and a half?

A

I don't know if a third is the right number, but one could certainly imagine the tac-air [tactical air] support to a theater consisting of F-22s and air cover, Joint Strike Fighters going in and going after mobile targets, and UAVs going together. And in fact, in *Aviation Week*, there's [an article] about the French having the back-seater of one of their aircraft controlling four UAVs in kind of a swarm. We're look-

ing at the same thing as a possibility. So it makes sense.

Q
You spoke a number of times about the need to make certain profit rates here comparable to the commercial sector. Do you have anything in the works right now to actually convert your view to a policy?

A
Yes, there's work in process, and one of these days, I'll find out [and] tell you about where it is. I get swamped with other things ... most of the time I get these issues [like] Crusader and things of that nature.

Q
But it's ongoing?

A
It is in the works. It's what's called "weighted guidelines." And one of the things we want to look at in the weighted guidelines is how does one calculate the fees for various kinds of contracts? And one of the things I want to remove out of that is facilities [being] part of the equation that allows companies to make profit on facilities; so that's an incentive for them not to get rid of excess capacity, because they get fee on top of that. Somehow the weight's wrong, and we need to make sure we do that right.

Q
I just want to ask you a broader question, about transformation, because I've heard that today we are going to get a briefing from the new Director of Force Transformation, retired Navy Vice Admiral Arthur Cebrowski. Admiral Cebrowski [has said] on numerous occasions that military transformation means preparing for warfare in the information age. And I'm wondering if that means—in terms of acquisition—does that mean [a shift in] investment in the information technology and telecommunications sector to the more traditional industrial-base types of activities?

A
It does mean that, but I would say it's much, much broader than that, as well.

The combination of evolutionary spiral development that gets something to the field quicker, with less risk, coupled with properly pricing programs—I can't think of any better way to maintain stability in a program than those two events.

I use this example too many times: A guy on a horseback with a GPS receiver calling in B-52s for close air support is kind of a transformational thought, in my view. And yet it was all legacy systems. But it was a different use of the systems that we have rather than something new and different, new in technology. But I think it is new technology because it allows you to do things in a much more effective way than you did in the past.

But transformation—and I've used this many times—is a journey. We're never going to get there. It's because transformation today will be different than transformation of tomorrow. And so I think Admiral Cebrowski's view is [similar]—I think I've heard him say it's much broader, and I agree with him—it's much broader.

Q
Do you plan any kind of restrictions on SBIRS-High now that you've certified it? And are there any kind of concerns, particularly to the HEO or GEO payloads?

A
We've certified to the four criteria. We've got a restructured program. It's been priced. It's going into the Air Force budget with the new numbers, with the new schedule. They have to come back with an updated program plan that puts all that together. I've asked for a review in about six months to see how well they're doing. I'd like to see [whether] the cost trends have started to make any difference in direction. But as you know, in the space business, we've transferred that responsibility from Milestone Decision Authority to Mr. [Peter] Teets as the Under Secretary of the Air Force. So since I have gone through the certification process—because I am the only one who has been delegated that responsibility for SBIRS-High—we're going to start moving some of the program day-to-day activities over to Mr. Teets—he'll have the next one.

Q
The EA-6B replacement study is out, yet there has been some talk that the Air Force is saying it's a nice study, but it didn't go far enough (just talking about aircraft replacement). What is your feeling on that study?

A
They need to make a decision rather than continue to study something. There are some interesting things in there. What we've asked the Air Force and the Navy to do is get together and go figure out a plan, because we can't afford two different airplanes for the two Services. There's going to be an integrated EA-6B replacement of some type. And if we can get the Air Force and the Navy together to figure out what that ought to be, that's the right answer.

Q
Mr. Secretary, a common denominator in each of the programs that you mentioned in the letter that you sent to the Hill on Nunn-McCurdy, was that you were going with the CAIG estimate.

A
Yes.

Q
Is that significant? If so, why?

A The CAIG estimates traditionally—and I [speak from] years [of experience with CAIG estimates] since I worked for PA&E in 1967 when we first started the CAIG —[are] usually within about 2 percent of the actual cost of a program when it's finished. The Service estimates are anywhere between 17 and 19 percent low. I'd rather go with a program that I have a little more confidence in, even though it's not perfect. And there will be some changes to it. In fact, the CAIG's been 2 percent low—it hasn't been high—on the average. And so I think it is better to take an independent look where people have data that go far beyond the indi-

vidual program managers' [data]—they see all of these programs of all the Services. And they have a lot more data on which to make an assessment of what they believe the cost is really going to be. I feel more comfortable taking that estimate than I do taking the Service estimate, although in some cases I've taken the Service estimate when I thought it was better. In fact, that's what we did with the F-22. We just bought the number of airplanes we could buy at the CAIG number.

If I want to tell somebody that I have properly priced the program, I have a tool, and I'm going to use that tool. It's called CAIG. And if I feel that there's a

huge difference in the cost between a Service and the CAIG, I want to use the CAIG, because we are more likely to come in at that cost. I've made this speech before—the combination of evolutionary spiral development that gets something to the field quicker, with less risk, coupled with properly pricing programs—I can't think of any better way to maintain stability in a program than those two events.

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

DEFENSE ACQUISITION UNIVERSITY AND THE BOEING COMPANY FORM STRATEGIC PARTNERSHIP

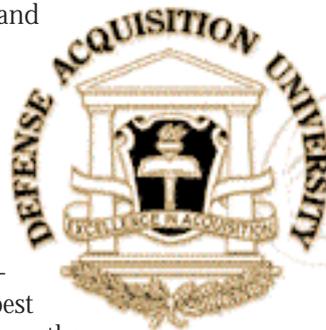
On June 20, 2002, Defense Acquisition University (DAU) President Frank Anderson Jr., and Stephen R. Mercer, Vice President, Learning and Leadership Development, The Boeing Company, formalized their ongoing relationship by signing a Memorandum of Understanding (MOU) to support each other's efforts to leverage the best business practices of government, corporate universities, and business for world-class training and education.

DAU and Boeing have long shared a mutual commitment to excellence in learning and an ongoing strategic collaboration for the best training that builds on the expertise of both the public and private sectors. This MOU establishes the framework to pursue educational opportunities that are mutually beneficial. Opportunities indemnified for the partnership include but are not limited to the following:

- The sharing of training resources, including the attendance of Department of Defense personnel

at Boeing courses, and the attendance of Boeing personnel at DAU courses for the purpose of improving each other's course offerings.

- Collaboration on course topics and course content, including reviews of student case presentations and mock negotiation exercises, providing the contractor's perspective in DAU courses and providing the government's perspective in Boeing courses.
- Guest visits by Boeing senior leadership as well as other participation by Boeing leaders as instructors and panel members at DAU courses.
- Guest visits by DAU's senior leadership as well as other participation by DAU leaders as instructors and panel members at Boeing courses
- Providing feedback to each other on training pilots and other course development activities.



For further information on this partnership, contact Wayne Glass, Director for Strategic Partnerships, Strategic Planning Action Group, at Wayne.Glass@dau.mil, or call 703-805-4480.

Pentagon Terminates Crusader Program

LINDA D. KOZARYN

WASHINGTON, May 8, 2002— Defense Secretary Donald H. Rumsfeld announced today that he has decided to terminate the Crusader artillery system.

The decision is “not about one weapon system,” Rumsfeld said, but about “a strategy of warfare that drives the choices we must make about how best to prepare the nation's total forces for the future ... We have an obligation to ensure that U.S. forces will overmatch the capabilities of any potential adversary now and into the future.”

The President has agreed to recommend to Congress an amendment to the fiscal 2003 budget request to terminate Crusader and to reallocate the funds to more transformational programs. Defense officials are working with the Army to prepare the details of an amended budget request that will be submitted no later than May 20.

The Army has spent \$2 billion on the Crusader and would have needed another \$9 billion to complete the program. A prototype had not yet been made. Rumsfeld, Deputy Defense Secretary Paul D. Wolfowitz, and Army Secretary Thomas White discussed the decision at a Pentagon press briefing Wednesday afternoon.

Rumsfeld said his decision also reflects the reality of “finite resources.”



“It is necessary to make choices, and in doing so, to try to balance among the various near-term, medium-term, and longer-term risks,” he said.

“What you have in this Department,” Rumsfeld said, “is a whole series of competing needs—personnel needs, pay vs. housing; modernization needs, new ships vs. new airplanes; transformation needs, this investment in research and development vs. that investment.”

U.S. defense officials are learning important lessons as they lead the coalition effort against terrorism in Afghanistan. One lesson, the Secretary said, is that defense leaders must be prepared to adapt to an ever-evolving set of challenges and circumstances. Thus, transformation is important.

“Our country needs an Army that is mobile, lethal, and deployable across a wide

range of future contingencies,” Rumsfeld said. “We need joint, integrated approaches to battlefield challenges. We need weapon systems capable of producing the precise and timely destruction of enemy targets.”

Rumsfeld acknowledged that some congressmen might not agree with his decision. “I’ve never seen a decision made that receives unanimous approval or unanimous opposition,” he noted.

“We are going to cancel the Crusader” when the dust settles, he said. “We’re going to make our case persuasively with the Congress. We will persuade as many people as we need, but not all, given the nature of life. It will end up being canceled.”

Wolfowitz said officials preparing the Defense Planning Guidance for fiscal years 2004 to 2009 concluded they needed to shift some investment dollars to prepare the Army to meet future security challenges. “Land warfare will continue to be a critical part of our defense strategy,” the Deputy said. “There is a vital role for accurate artillery in establishing battlefield dominance.

“We want Army weapons to support a transformed Army that is more mobile, lethal, and deployable across a wide range of future contingencies,” Wolfowitz said. “Precision fire has proved to be one of the most transformational improvements in modern warfare.” The Army must invest in innovative technologies and ideas that represent the future of battlefield technology for indirect fire.

The Crusader, Wolfowitz said, was originally designed for a different strategic con-

text. Canceling the program “will make room for more promising technologies that offer greater payoffs and are more consistent with the Army’s overall transformation effort.” The emphasis will be on systems and technologies that provide greater precision, more rapid deployability, and the ability to integrate fires.

“The Secretary has made a decision, and the Army will work hard to execute that decision,” said White, who has asked the Army inspector general to investigate possible inappropriate behavior regarding a lack of support for the decision to terminate the Crusader and a lobbying campaign to save it.

White noted that talking points the Army prepared in support of the Crusader included comments he considered “offensive” and that did not reflect the Army’s position. “When we complete the report, I will discuss it with the Secretary of Defense and appropriate action will be taken.”

In the absence of Crusader, White said, the Army “will put together programs and structure to satisfy that requirement through a different combination of programs.”

“The requirement for indirect fire systems to support the U.S. Army across the full spectrum of conflict—24-7, all-weather, tactical operational ranges, precise and mass targets—continues,” he added. “That requirement is valid and has to be met.”

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

Transitioning the Defense Acquisition Deskbook

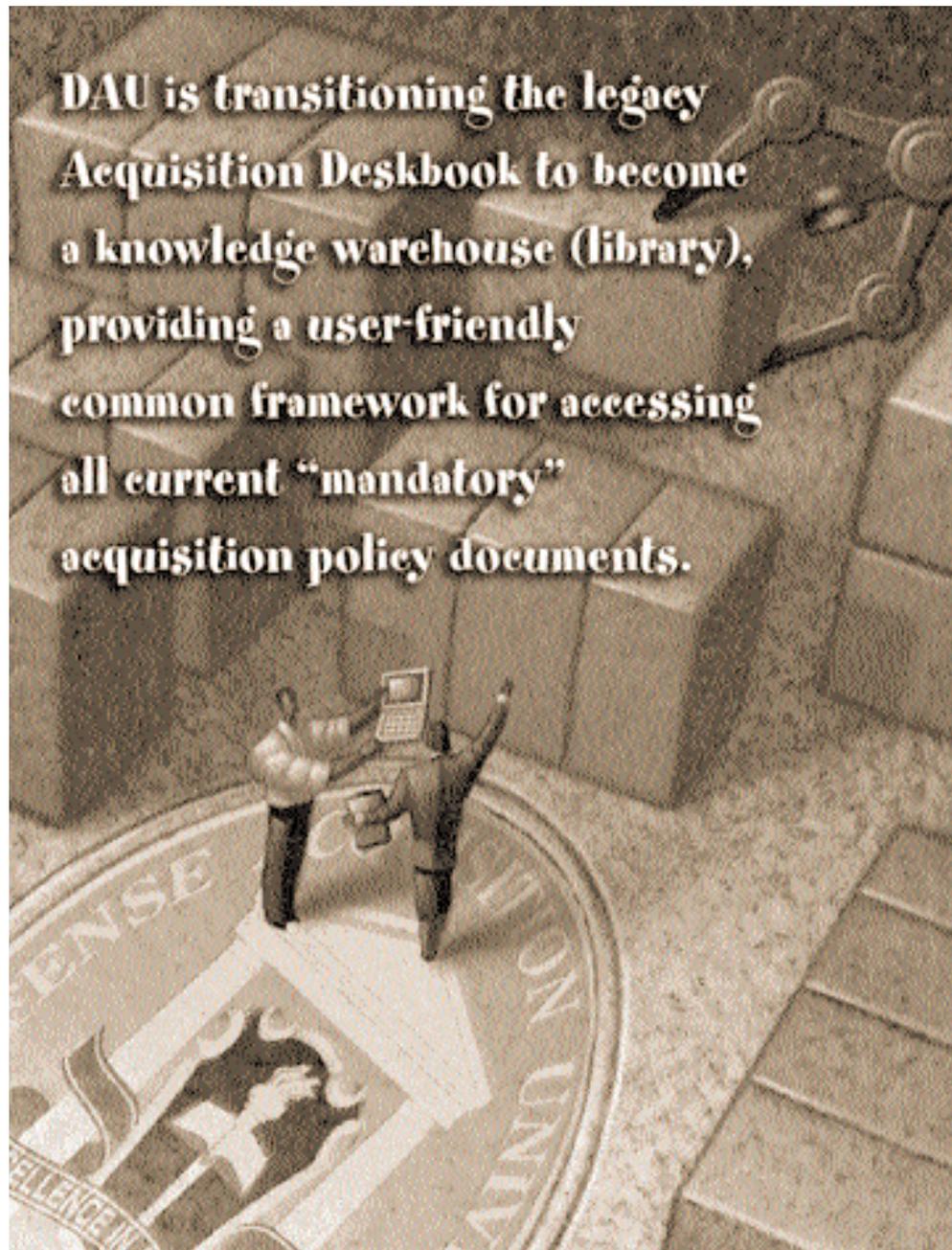
First Release of New DoD AT&L Knowledge Sharing System Set for Fall 2002

SYLWIA GASIOREK-NELSON

In March 2002, the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (USD [AT&L]) authorized the Defense Acquisition University (DAU), Fort Belvoir, Va., to facilitate the transformation of the legacy Acquisition Deskbook, currently hosted at Wright-Patterson Air Force Base, Dayton, Ohio, to a new DoD AT&L Knowledge Sharing System (Figure 1). The resultant system, planners envision, will be a new generation Acquisition Deskbook that will provide a more robust and capable tool for the DoD AT&L workforce.

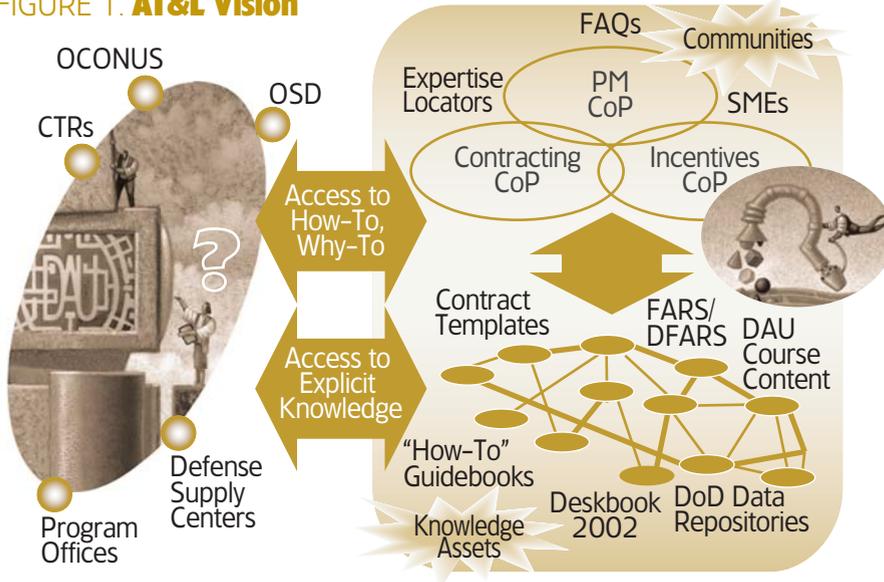
About the Acquisition Deskbook
From its inception in 1995, the Acquisition Deskbook was intended to be a centralized repository for formal acquisition policy and for the collection of best practices, lessons learned, courses, templates, recipes, rules of thumb, and other informal/discretionary information that is used to implement policy and manage programs. This initiative offered the acquisition community something they had never had before—acquisition information at their fingertips in one location.

The growth of Web technologies spawned a multitude of independent knowledge communities and sources. Recognizing that the centralized Acquisition Deskbook framework was becoming increasingly less effective, the Office of the Secretary of Defense (OSD) began searching for an integrated but decentralized approach, with the principles of knowledge management shared



Gasiorek-Nelson is a full-time contract editor for Program Manager Magazine.

FIGURE 1. AT&L Vision



among Communities of Practice (CoPs). CoPs, a relatively new strategy for knowledge sharing, are networks of people held together by a common purpose, who share and learn from one another.

Consequently, in June 2000 the USD(AT&L) issued guidance to establish a comprehensive Acquisition Knowledge Management System (AKMS) to enable the acquisition workforce to acquire, create, integrate, share, and quickly reuse knowledge to achieve mission objectives. In March 2001, the Defense Acquisition Policy Steering Group approved the road map for AKMS development, which included:

- transitioning the Acquisition Deskbook to become a knowledge warehouse (library), providing a user-friendly common framework for accessing all current “mandatory” acquisition policy documents;
- promoting CoPs; and
- developing Knowledge Management (KM) tools, including a new AT&L portal.

In July 2001, the Office of the Director, Acquisition Initiatives, USD(AT&L), facilitated group exercises with representatives from the DoD AT&L workforce—which included both government and industry—to identify a set of “portal” requirements for a new AT&L knowledge system. These data requirements are now playing an important role

in defining the future “end state” of the overall system as the Acquisition Deskbook transitions to a new DoD AT&L Knowledge Sharing System at DAU. The transition of the Acquisition Deskbook is a step toward sharing of knowledge in a shared practice of education, knowledge, and training.

System Development and Management Approach

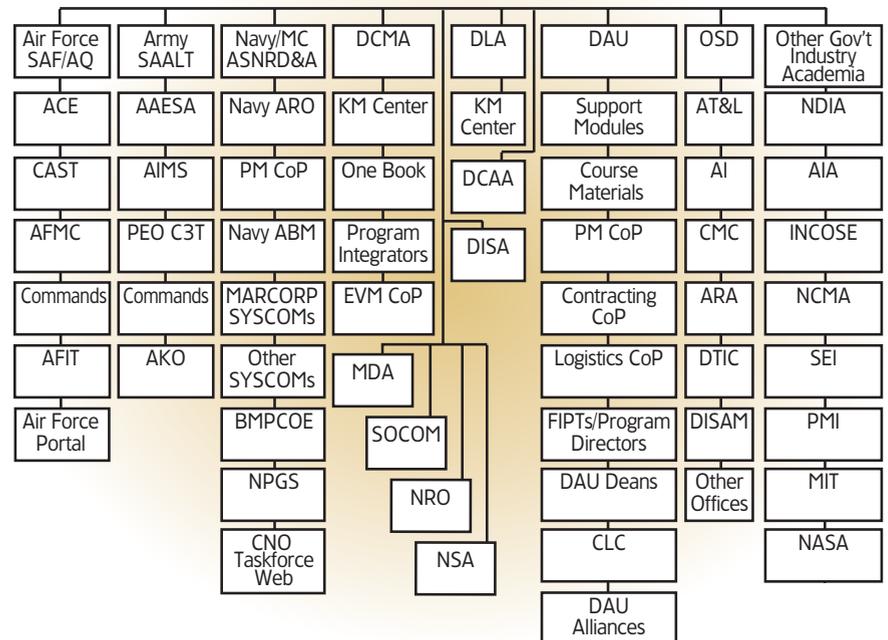
A network of Service, Agency, and OSD representatives (Figure 2), who are dedicated to providing online performance support knowledge and tools to the DoD

AT&L workforce members, and a DAU Systems Integration Contractor team will work together to:

- identify the product and functional requirements;
- develop a set of knowledge maps/taxonomies that best describe the DoD AT&L “system”;
- identify and contribute locally developed and managed knowledge objects/resources that will be shared through the new system’s “gateway”;
- develop the “gateway” access architecture and user-friendly interface;
- identify user test subjects;
- develop updates to the system on a continuous, evolutionary basis;
- develop the overall system architecture and knowledge access methods; and
- identify major linkable elements for the system.

The USD(AT&L), with the support of the Defense Acquisition Policy Steering and Working Groups, will support and oversee the system, with DAU acting as the system manager and network coordinator. DAU will form the Service, Agency, and OSD knowledge-provider network and host the system’s Web site at DAU’s Web hosting facility. Network members will be responsible for the management

FIGURE 2. DoD AT&L Knowledge Sharing Network



COMMUNITIES OF PRACTICE—WHAT IS A CoP?

A Community of Practice (CoP) is a group of people who form around a topic/domain to share ideas, information, and lessons learned; learn together and evolve the knowledge of the domain; and create and manage tools, techniques, as well as the process of the domain.

What can be gained?

- Productivity
- Teaming
- Faster Decisions
- Quality of Life
- Corporate Knowledge
- Creativity
- Collaboration
- Better Decisions
- Practical Use of Lessons Learned

The most successful CoPs share knowledge across organizational divisions in order to include many different perspectives and concerns on the topic. Instead of, or in addition to communities formed around a particular problem area, CoPs could be formed for functional areas across the systems. The formation of CoPs is important to:

- facilitate the sharing of domain information and knowledge;
- evolve the discipline of the domain;

- achieve a greater sense of communication with peers;
- improve innovation; and
- save time looking for information.

Fulfilling its goal—supporting the Acquisition Community—the Knowledge Management team focuses on the following objectives:

- establishing and supporting communities of practice in a sharing environment by enticing, exciting, and engaging community members (novices and practitioners, all Services, government, and industry);
- improving community performance by providing access to existing knowledge resources and creating new knowledge framed in the context of daily work processes as determined by the community;
- capturing the corporate knowledge of the retiring workforce and transferring it to the new workforce; and
- establishing a PM CoP "Portal" on the World Wide Web that incorporates the functions determined necessary by the community.

and funding of their locally owned and maintained knowledge assets.

Major Elements

Access to the new AT&L Knowledge System will be through a simple, user-friendly Web site. It will be a "gateway" for users to access mandatory policy/processes, discretionary knowledge, experts, and other tools to assist the DoD AT&L workforce (government and industry) in providing the best weapons and support systems possible to U.S. warfighters. The gateway will principally point to Service, Agency, and OSD knowledge assets, including active CoPs (Figure 3).

A network of Service, Agency, and OSD organizations that develop, provide, and maintain policy and knowledge assets for the DoD AT&L workforce is currently being formed to create a network of DoD AT&L knowledge providers. The new network will develop the overall system architecture and knowledge access methods, and identify major linkable elements for the system. Major elements of the system will include:

- a virtual reference library for all mandatory DoD AT&L policies issued

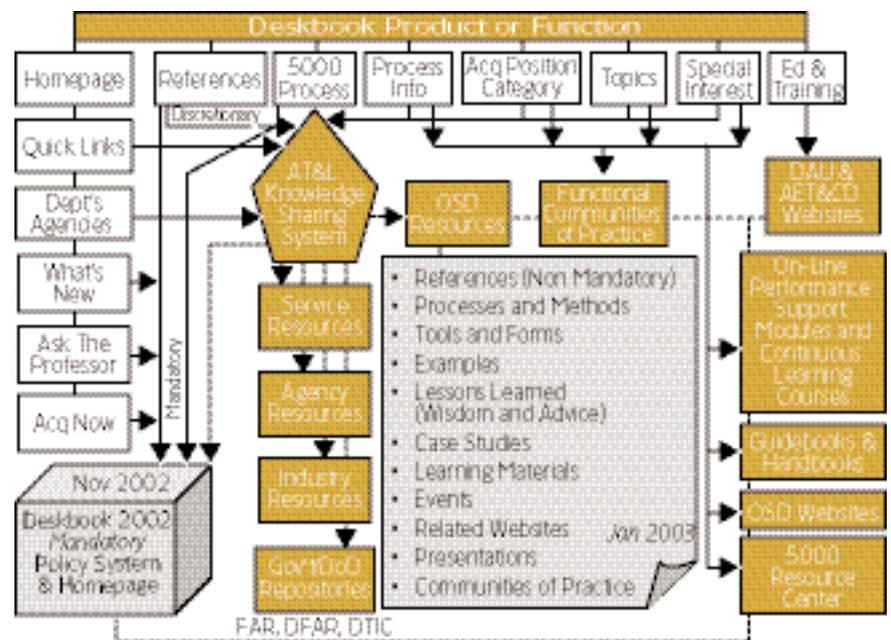
by an Acquisition Executive, Acquisition Agency head, or Major Command commander, which affect the DoD AT&L workforce career fields;

- an organized listing of links to active CoPs supporting the DoD AT&L career fields/competencies, critical busi-

ness processes/practices, initiatives, products, and organizations;

- an organized listing of valuable Service, Agency, OSD, DoD Industry, and Academia Web sites specifically focused on providing DoD AT&L knowledge and expertise;

FIGURE 3. Transition of Deskbook Products and Services to AT&L Knowledge Sharing System



- a DAU “knowledge object” repository of: course materials; OSD/Service/Agency guides and handbooks; continuous learning courses/job support modules; and
- multiple knowledge access approaches/tools to help users find the knowledge/expertise they require in a minimum amount of time. These tools will include a robust and selectable search capability, knowledge map indexes for all competency areas, and knowledge gateway documents that allow direct linking to other knowledge assets from top-level sources such as the 5000-series documents.

Evolutionary Release Schedule

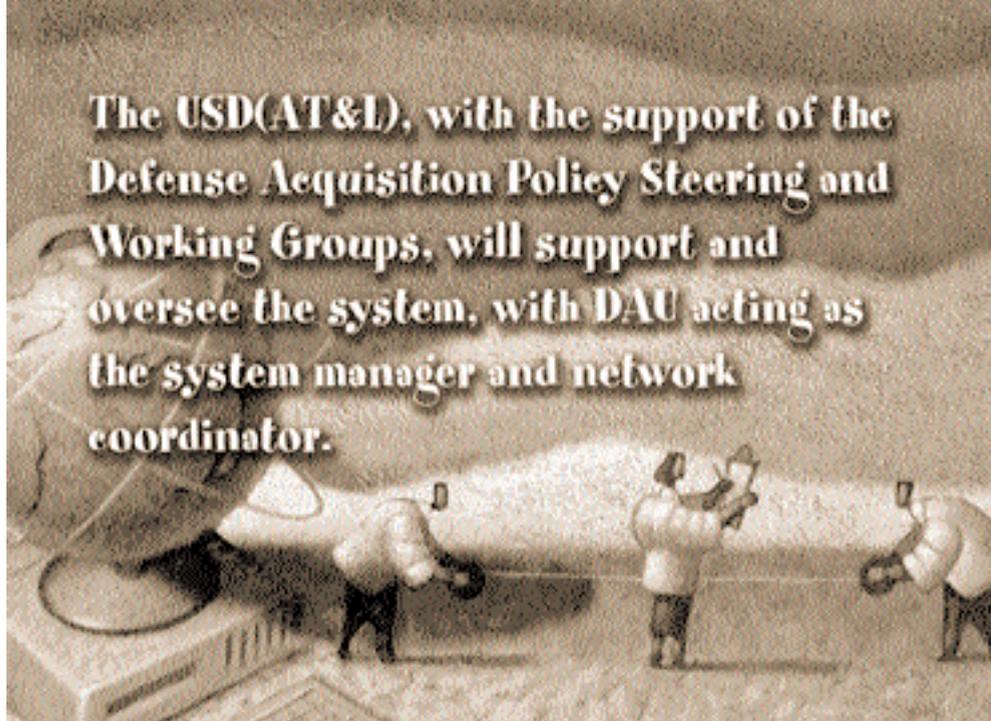
OCTOBER/NOVEMBER 2002

The first release of the new DoD AT&L Knowledge System will focus on the new Acquisition Deskbook 2002 reference library for all mandatory acquisition and logistics policies. The release is envisioned for October/November 2002. Along with this release, the user will be provided with multiple alternatives to access discretionary information and knowledge.

One of the alternatives will be regular access to and search of the documents in Acquisition Deskbook 2001, which was updated for the last time in March 2002. Through the new Acquisition Deskbook home page, users will also access new discretionary knowledge provided by DoD AT&L Network System members such as the emerging Program Management CoP; DAU course materials for students; continuous learning courses and online performance support modules; and resources identified by the Services, Agencies, OSD, Industry, and Academia. This will be an interim system for approximately three to six months until the second release formally replaces the Acquisition Deskbook's discretionary information with a distributed and empowered system provided by the AT&L knowledge providers' network.

JANUARY 2003

The second release will focus on the efforts of the DoD AT&L knowledge providers network to build on the new



Acquisition Deskbook 2002 reference library with their shared knowledge resources. Knowledge files in the legacy Acquisition Deskbook will be reviewed for applicability and accuracy and transferred to appropriate OSD and Service repositories/Web sites. In addition to more discretionary resources being offered to the workforce, this release will focus on better access tools (knowledge document gateways) and integrating methodologies to minimize the time needed to get to just the right knowledge to support the task at hand. This release is planned for January 2003.

In addition, a six-month cycle of feedback, assessment, planning, and updating of the system will take place. It is envisioned that additional members will continually join the DoD AT&L Knowledge Sharing Network, and the stand-up of additional CoPs will enrich the system.

Transition Process

Until the new system is released in January 2003, the legacy Acquisition Deskbook will remain online, and a transition Web site at DAU will provide transition information and updates of major importance to the workforce. This transition information center will also act as a development site for the new AT&L Knowledge Sharing System, allowing the workforce access to the new knowledge resources continuously provided by the

network. An online “requirements” survey will allow the workforce to provide input on their specific product and functional needs to maximize the effectiveness of the new system.

Acquisition Deskbook CD

As a part of the Acquisition Deskbook transformation activity, a new CD will be produced and distributed in January 2003. The exact contents of the CD have not yet been established, but as a minimum it will include a reference library of mandatory policy and regulatory documents from OSD, the Services, and Agencies. Other documents that are considered “mandatory” by user organizations for remote operations demanding the use of a CD will be considered for central storage in the new Acquisition Deskbook repository. A network of OSD, Service, and Agency representatives will determine requirements and identify documents to be centrally managed and loaded on future Acquisition Deskbook CDs.

Editor's Note: The most current and accurate information regarding the Acquisition Deskbook transition is available at <http://deskbooktransition.dau.mil>; the latest information on how to get a CD, how to download it to burn a copy locally, and all production and distribution information is available at <http://web1.deskbook.osd.mil/cdms/welcome.asp>.

Best Value Formula

The Best Value Formula is About Not Punishing the Government

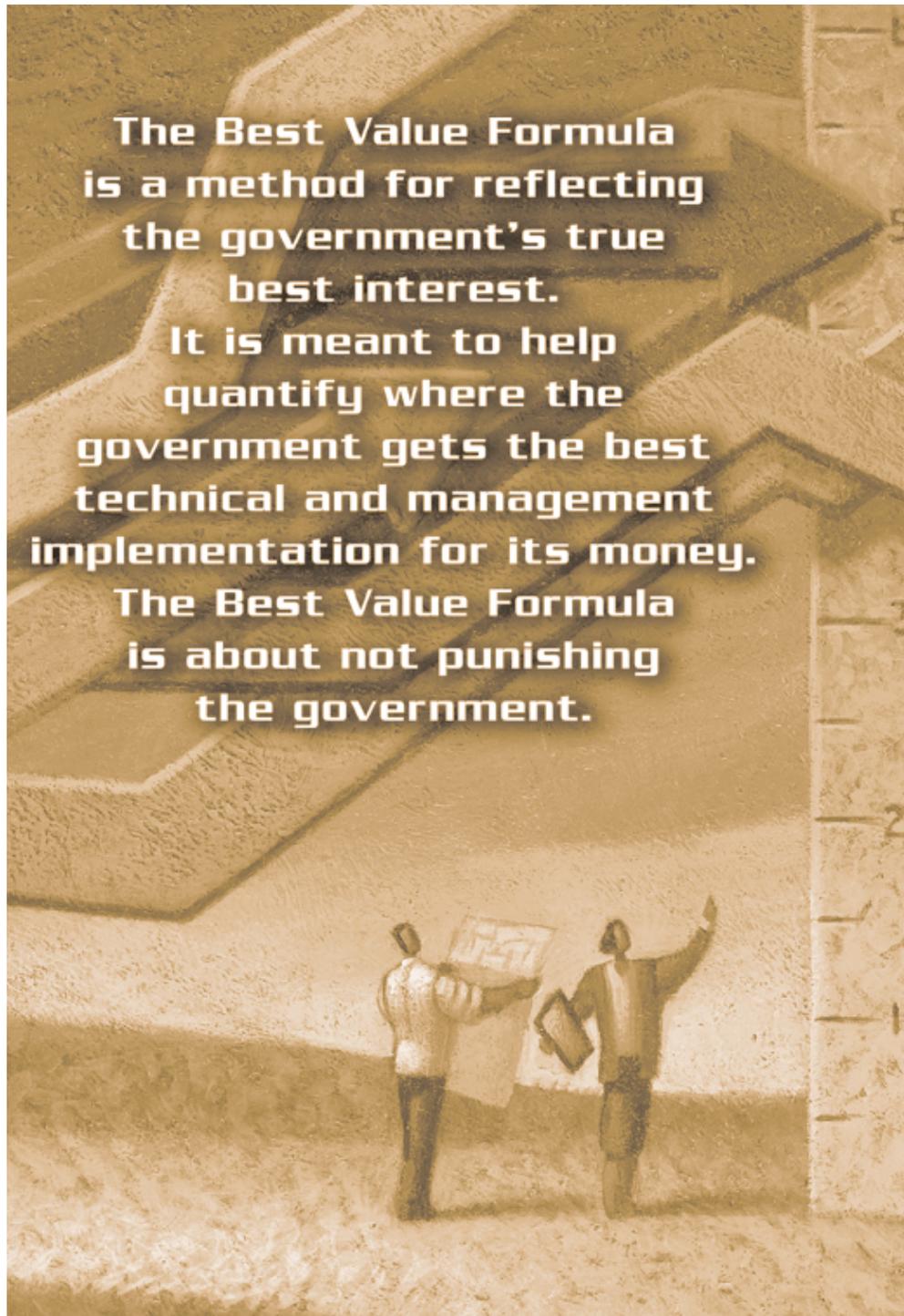
DAVID P. QUINN

A constant concern when preparing to release a Request for Proposal (RFP) is one bidder throwing things completely out of whack by “low balling” the proposal. In other words, they bid extremely low, willingly incurring a loss in most cases, just to get the job and position themselves for future contracts from the same acquisition organization. Because the bidder offers such a low price for the contract, their limitations in their technical and management proposals get lost.

Eyes on the Prize

Our organization is in the process of preparing for a firm fixed price contract to perform a set of concept studies. The results of the concept studies will be used as input in a development and integration contract. The concept studies contract is not considered a lucrative contract. The prize is actually the development and integration contract. Everyone believes the winner of the concept studies contract will have an inside track on the more lucrative contract.

When developing the proposal evaluation criteria, we were haunted by the fact that we could only take the weight of the price factor so low (30 percent) without requiring a General Accounting Office (GAO) audit of the bidders on the contract. The weight for the price factor looked relatively high, especially for a fixed price contract. Our fear was that one of the bidders would bid incredibly low just to get in position for



Quinn was a Senior Computer Scientist for the National Security Agency. He has 19 years of software and systems engineering experience, focusing more recently on process improvement.

the follow-on contract and that the technical and management factors would become worthless at that point.

This isn't to say that we would not have welcomed a very low price for a very good technical and management proposal. Ideally, this is what everyone wants. We just wanted assurances that this would be the case and that a poor proposal did not win just because it was priced excessively low.

Evaluating Proposals

While some people may think that price is the only factor in determining who wins a government contract, it is not. Generally, there are four major factors when evaluating contracts: technical approach, management approach, past performance on similar contracts, and price.

Each major factor is assigned a weight such that the sum of the weights equals 100. Typically, weights are distributed 30 for technical, 30 for management, 10 for past performance, and 30 for price. These weights may be adjusted to place greater emphasis on one area over another. For instance, our RFP assigned weights of 60 for technical, 10

FACTOR/SUB-FACTOR	WEIGHT	RATING	SCORE
Technical	60	88.3%	53
Trade Studies	20	85%	17.0
Architectures	15	90%	13.5
Innovation	25	90%	22.5

TABLE 1. Example of Technical Score

for management, and 30 for price. Past performance was made a pass/fail factor with no weight.

Each major factor may have one or more sub-factors that comprise the major factor. For instance, management may have sub-factors of project management and key personnel. Each sub-factor is weighted and scored individually. For our RFP, the technical factor had sub-factors of trade studies, architectures, and innovation with weights of 20, 15, and 25, respectively.

When evaluating proposals, a defined set of criteria for each sub-factor is rated. The rating is done as a percentage of a sub-factor and has an adjectival descriptor associated with it. The usual rating scale is:

Excellent	90-100
Good	80-89
Acceptable	70-79
Marginal	60-69
Unacceptable	0-59

Unacceptable ratings are based on completely missing one of the criteria for a sub-factor or major factor. Marginal means that there are faults in the proposal against certain criteria but the criteria are addressed. Acceptable means that the criteria are met. Ratings above acceptable indicate that the proposal had some additional information that helped it stand out.

FACTOR	BID 1	BID 2	BID 3	BID 4	BID 5
Bid Price	9	10	9	8	4
Lowest Price	4	4	4	4	4
Price Weight	30	30	30	30	30
Price Score	13.3	12	13.3	15	30

TABLE 2. Impact of a Low Ball Bid

The score for a factor is therefore defined as the sum of the scores of the sub-factors. The score of the sub-factor is the rating times the weight. Using our technical factor as an example, a sample scoring would look like Table 1.

The final score for a proposal evaluation is the sum of the scores for the major factors. In most instances, the final score formula looks like this:

$$\text{Final Score} = \text{Technical Score} + \text{Management Score} + \text{Price Score}$$

The highest final score is considered the contract winner. To select a bidder that did not receive the highest score requires lots of extra paperwork. In the case of a contract similar to ours, 500 pages of justification were generated to justify not selecting the highest score.

Cost as a Factor

One factor that is not rated on the scale shown in Table 1 is price. Cost simply indicates what the vendor will charge for its services. Therefore, all price proposals are assumed to be acceptable.

A very generic formula is used when determining price as a factor for most contract proposals. All the proposals are received and the lowest price of all the proposals becomes the standard by which all the proposals are evaluated. One at a time, each proposal is evaluated by taking the lowest proposal price

and dividing it by the price of the proposal being evaluated. That fraction is then multiplied by the weight of the price factor for the price score. The formula looks like this:

$$\text{Price Score} = \text{Price Weight times} \\ (\text{Lowest Price divided by the Current} \\ \text{Proposal Price})$$

In theory, this is not bad. It works best when the proposed prices are all in the same neighborhood. For instance, everyone bids in the \$8-10 million range. However, when theory meets reality, reality tends to win.

If one bidder really sends in a low price, all the other proposals pay the consequence. If three bids are in the \$8-10 million range but a fourth bid comes in at \$4 million, the other proposals lose almost half the price factor points right away. It requires that the \$4 million proposal be deemed unacceptable for its technical or management proposal in order to lose and not have any impact on determining the contract winner.

Table 2 (bottom of preceding page) is an example of a bidder trying to get a contract based on an extremely low bid.

Due to the extremely low bid of Bidder 5, Bidders 1 through 4 lost over half the number of price points available. The reality is that if Bidders 1 through 4 received ratings of 100 on each factor, the best overall score they could get is 85.

Examples of Impact of Price on Contract Award

It is important to see what this looks like in terms of comparative bids on a contract. Table 3 shows five bidders' proposals on a contract, with two of the bidders trying to "low ball" the other bidders. Past performance will be pass/fail so no weighted scores are needed for the past performance factor.

As the Final Scores in Table 3 show, the order of award follows the order of price from least to most (i.e., Bidder 5, Bidder 4, Bidder 3, Bidder 1, then Bidder 2). Bidder 5 was able to win a contract, despite having a barely adequate pro-

FACTOR	BID 1	BID 2	BID 3	BID 4	BID 5
Technical Weight	40	40	40	40	40
Technical Rating	85 %	90 %	90 %	80 %	70 %
Technical Score	34	36	36	32	28
Management Weight	30	30	30	30	30
Management Rating	90 %	90 %	90 %	80 %	70 %
Management Score	27	27	27	24	21
Price Weight	30	30	30	30	30
Price Bid	7	10	6	4	3
Lowest Price Bid	3	3	3	3	3
Price Score	12.9	9.0	15.0	22.5	30.0
Final Score	73.9	72.0	78.0	78.5	79.0

TABLE 3. Example of Proposal Scores

posal, by "low balling" the bid. Obviously, this does not give the government the best value for its money and perpetuates the stereotype that the lowest bid always wins. The government's only hope is that the bidder fails the past performance factor.

Finding the Real Best Value

The desirable position for the government is to find a way that directly considers the price bid with the technical and management capability so that price is not the true deciding factor. In essence, the government should receive the best value for its investment by ensuring the price is proportionate to the technical and management proposals.

This actually makes the price evaluation more consistent with the rest of the pro-

posal evaluation process. Technical and management proposals are evaluated independent of the other bidders' technical and management proposals. Great strides are taken to ensure that one proposal does not influence the rating of another proposal. However, the price proposal is directly evaluated against the other bidders' price proposal. The price evaluation needs to move away from strictly looking at comparisons between proposals.

To address price in relation to technical and management proposals, the weight of the price factor should be adjusted based on the scores of the technical and management proposals. If you add the technical and management scores and divide that sum by the sum of the technical and management weights, a Best

FACTOR	BID 1	BID 2	BID 3	BID 4	BID 5
Technical Weight	40	40	40	40	40
Technical Rating	85 %	90 %	90 %	80 %	70 %
Technical Score	34	36	36	32	28
Management Weight	30	30	30	30	30
Management Rating	90 %	90 %	90 %	80 %	70 %
Management Score	27	27	27	24	21
Price Weight	30	30	30	30	30
Price Bid	7	10	6	4	3
Lowest Price Bid	3	3	3	3	3
Price Score	12.9	9.0	15.0	22.5	30.0
Old Final Score	73.9	72.0	78.0	78.5	79.0
Best Value Ratio	.8714	.9000	.9000	.8000	.7000
Best Value Factor	26.1	27.0	27.0	24.0	21.0
Best Value Score	11.2	8.1	13.5	18.0	21.0
New Final Score	72.2	71.1	76.5	74.0	70.0

TABLE 4. Example of Best Value Formula Results

Value Ratio is created. The Best Value Ratio is multiplied by the price factor weight to get the Best Value Factor for the proposal. The Best Value Factor is then substituted for the Price Weight to calculate the price score. The formulas for this series of computations are:

Best Value Ratio = (Technical Score + Management Score) divided by (Technical Weight + Management Weight)

Best Value Factor = Best Value Ratio times Price Weight

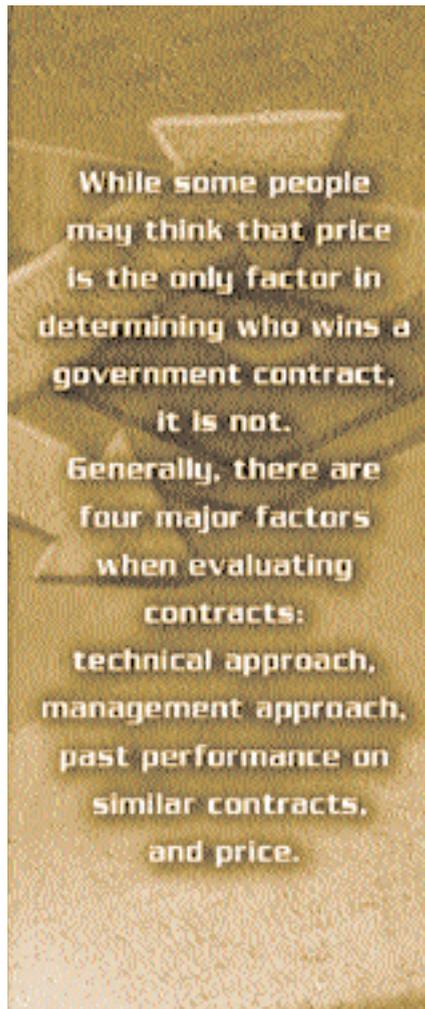
Best Value Score (or Price Score) = Best Value Factor times (Lowest Bid divided by Current Price Being Evaluated)

If this Best Value Formula is applied to the bids used in Table 3 (and repeated in Table 4), the order of the bids is changed. Hopefully, the order is better oriented toward the government's desires.

Using the Best Value Formula and assuming all bidders pass the past performance criterion, Bid 3 would be awarded the contract since its strong technical and management proposals had little impact on its competitive price. Bid 5's attempt to "low ball" the bid goes unrewarded as its weak technical and management proposals weakened the impact of its low price. The bid that provides the best value is identified and rewarded.

Whither Goes the Past Performance Factor

The examples in Tables 2 through 4 were all based on the assumption that past performance is a pass/fail factor and it does not have any weight associated with it. If past performance is a rated factor with an associated weight, it is up to the acquisition organization to determine if past performance scores should be part of the Best Value Formula. If the organization decides that past performance will be part of the Best Value Formula, the past performance score should be added to the technical and management scores in the Best Value Ratio. Additionally, the past per-



formance weight should be added to the technical and management weights in the ratio. The Best Value Ratio would then look like this:

Best Value Ratio = (Technical Score + Management Score + Past Performance Score) divided by (Technical Weight + Management Weight + Past Performance Weight)

Punishment or Reward

A question that might be asked is whether or not a bidder is being penalized twice for a weak technical or management proposal. As the examples in Tables 2 through 4 show, all the bidders were deemed acceptable. Thus, it is hard to call applying their technical and management scores to their price proposal a punishment. At the same time, a bidder that provides an "excellent" proposal should be rewarded in some way. The Best Value Formula rewards bidders that have stronger proposals.

More importantly, the question should really be, is it fair to punish the government with a less qualified bidder just because they had the lowest price. The Best Value Formula is a method for reflecting the government's true best interest. It is meant to help quantify where the government gets the best technical and management implementation for its money. *The Best Value Formula is about not punishing the government.*

Validating the Best Value Formula

A program similar to ours just completed awarding three contracts to conduct concept studies. There were four bidders and one of them tried to "low ball" the bid—significantly. The "low ball" bid had the worst technical and management proposals but it had the highest score based on its low price. It required 500 pages of documentation to support not awarding one of the three contracts to this bidder.

The scores from this program's evaluation were entered into the Best Value Formula. The "low ball" bid ended up having the lowest score of the four bids. The Best Value Formula placed the bid in an order that best represented best value to the government.

Final Justification

When going to contract, the government should have a tool that alleviates the concern that a bidder is going to throw the entire acquisition out of line by focusing on price vs. a sound technical and management proposal. The current method for determining the impact of price is based on a comparison between bids. Price needs to be considered in direct correlation with technical and management proposals. The Best Value Formula considers price with relation to the other factors. It does a much better job of focusing the proposal evaluation process away from price and toward a more complete picture of the proposal.

Editor's Note: The author welcomes questions or comments on this article. Contact him at DQuinn@sensibleprocess.com.



conference on
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2. System concept development
3. System architecture formulation, modeling and assessment
4. System validation and verification

5. COTS-intensive

- open systems
6. System test and integration
7. Human computer interface
8. Quality, schedule, cost, and risk relationships in development

Analysis & Modeling:

1. Architecture evaluation metrics and measures
2. System modeling and simulation architectures
3. System life cycle costing and performance & cost trade-offs

4. System reliability, maintainability, dependability and supportability
5. System and information quality and assurance
6. Quantitative risk assessment and management

Operations Management & Support:

1. System sustainment: Management of suppliers, partners, technologies and standards, and system configurations
2. System technology refreshment and insertion

ABSTRACTS

Abstracts must include: 1) A Title; 2) Full Names and Affiliations; 3) Complete Address for the Corresponding Author

Please submit your abstract (not to exceed 400 words) to:
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Associate Dean and Professor of Systems Engineering
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Stevens Institute of Technology, Castle Point on Hudson
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Tel: 201.216.8334 or 201.216.8645

Abstracts may also be sent electronically in Microsoft Word or pdf formats to: celson@stevens-tech.edu.

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Acceptance Notification and Author Instructions:	October 1, 2002
Submission of Camera-Ready Research Papers:	February 1, 2003



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ANNOUNCEMENT AND CALL FOR PAPERS

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Stevens Institute of Technology in cooperation with University of Southern California, INCOSE's Systems Engineering Center of Excellence (SECOE) and NDIA's Systems Engineering Technical Committee presents this inaugural Systems Integration conference.



The conference theme is the Design, Analysis and Modeling, Management, Use & Operations, and Support of Complex Systems in Information Technology, Telecommunications, and Network Centric Aerospace and Defense Domains.

The primary objective is to serve as a forum to identify challenges, issues and research progress within the field of systems integration while also providing decision makers and researchers within government, industry, and academia a forum for the exchange of ideas and concepts.

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NEW ACQUISITION POLICY STRESSES SPEED, CREDIBILITY

WASHINGTON (AFPN)—Speed and credibility are enshrined as top priorities for all acquisition programs, according to a new policy the Air Force's senior acquisition official approved June 4.

"The two overarching objectives of this policy are to shorten the acquisition cycle time and to gain credibility within and outside the acquisition community," wrote Dr. Marvin Sambur, Assistant Secretary of the Air Force for Acquisition. "Every action and decision by individuals responsible for program execution must map directly to, and further these two primary objectives."

Warfighters are demanding faster delivery of new capabilities to meet unexpected and unpredictable threats, Sambur said. At the same time, Air Force leaders, Congress, and others are insisting that Air Force acquisition programs deliver what they promised, on time and on budget. The new policy lays the foundation for meeting both requirements, he said.

The new policy, developed jointly by Air Force acquisition headquarters and Air Force Materiel Command [AFMC] officials, is one of the cornerstones of the Air Force's Agile Acquisition effort launched in late 2001.

It marks a new philosophy in regulating Air Force acquisition, according to Air Force officials. Unlike the 1993 policy it replaces, which was highly prescriptive, the new one challenges managers to find better ways to do their business without telling them, step-by-step, exactly how.

"This is a huge step toward freeing our managers to manage," said Gen. Lester Lyles, Commander of AFMC. "We are going to get out of the checklist mentality and eliminate from our processes all the steps that add time but are of little value."

The new policy memorandum, which will be followed soon by a formal, permanent policy directive, makes clear that all acquisition programs must

continue to conform to federal law and Defense Department regulations. But it also directs program managers and others to find the best way for their programs to meet those requirements.

"One size does not fit all," said Lyles.

"All activities, reports, plans, coordination, or reviews except those mandated by statute or previously approved by a person in the execution chain, must buy their way into the program. The benefit gained must clearly equal or outweigh the resources expended," the memorandum states.

The memorandum also established collaborative spiral development as the preferred way to acquire systems.

Sambur said too many programs get into trouble because they try to deliver everything the warfighter wants all at once.

"These programs are very complex and we have to stop trying to 'eat the elephant' in one bite," Sambur said. "If we work with our partners—the warfighters, testers, technologists, budgeters, and logisticians—and develop these in systems increments, we'll break these complex programs into manageable 'bites.' That will allow us to deliver capability more quickly and give us a much better chance of meeting our cost and schedule goals."

The new policy also underscores the importance of strong systems engineering up-front in every program, particularly in the first spiral.

"Systems engineering lays the foundation for success," Sambur said. "When you look at programs that get in trouble, you usually find weaknesses in systems engineering at the outset. This new policy makes clear that we're going to attack that."

Editor's Note: This information, courtesy of AFMC News Service, June 7, 2002, is in the public domain at <http://www.af.mil/news>.

DAU Introduces Online International Acquisition Course

Basic-Level Training Opportunity

RICHARD KWATNOSKI

For over five years, the Defense Acquisition University (DAU) has offered a full program of international acquisition training and education at the intermediate level and beyond. Comprised of a family of international acquisition courses and continuous learning opportunities, DAU's International Program prepares the acquisition workforce for the many challenges of international acquisition programs.

Recently, DAU added an online training opportunity at the entry level. This article describes the new online course and also includes information on the entire DAU International Program.

Courses

The DAU International Program includes three assignment-specific mandatory acquisition courses.

Multinational Program Management Course (PMT-202)

This course emphasizes the National Security policy of engagement by encouraging armaments cooperation and interoperability with our allies. Students develop an understanding of how to be effective in an international defense acquisition program. Key national, DoD, and Service policies on international cooperative development, production, and support are explored.

International Security & Technology Transfer/Control Course (PMT-203)

This course is a comprehensive review of security and technology transfer/control issues found in international acquisition programs.



Advanced International Management Workshop (PMT-304)

This workshop explores issues associated with international negotiation of cooperative acquisition project agreements. Specific topics include negotiation preparation, authority to negotiate

and conclude, Department of Defense policies and experiences, and the role of executive departments and the Congress. Upon course completion, students are able to prepare and negotiate an international acquisition project agreement.

Kwatnoski is the Director of International Courses, Defense Systems Management College-School of Program Managers, Fort Belvoir, Va. A member of the Defense Acquisition Corps, he is Level III-certified in the Program Management career field.

Continuous Learning

The DAU international acquisition continuous learning program consists primarily of two annual international seminars and a biannual forum.

International Seminars

DAU has formed strategic arrangements with Atlantic and Pacific partners. With Atlantic partners, we have conducted an annual international acquisition/procurement seminar, on a rotational basis, with defense acquisition educational institutions in the United Kingdom, Germany, and France. The Fourteenth Annual International Acquisition/Procurement Seminar—Atlantic, was held in July 2002 in Paris, France.

In the Pacific, we have a similar arrangement with defense institutions and Ministries in Australia, South Korea, and Singapore. The Fourth Annual International Acquisition/Procurement Seminar—Pacific, is scheduled for September 2002 at DAU, Fort Belvoir, Va.

International Acquisition Forum

Also at DAU, we host a biannual International Acquisition Forum for the Office of the Secretary of Defense (OSD) and the Services to present and exchange views on contemporary, and sometimes contentious, international acquisition

topics. DAU has hosted all 12 of these Forums since 1996, which are chaired by the OSD Director, International Cooperation. These forums receive high-level attention from OSD. Both the Under Secretary and Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics) have occasionally presided.

New Online International Course
International acquisition training historically began at the intermediate level of acquisition courses. While entry-level acquisition workforce personnel would rarely be involved in an international program, a need existed to provide some basic-level training opportunities, especially for those unable to attend the classroom courses.

To fulfill the need for a basic-level course, the Director, Acquisition Initiatives, Office of the Under Secretary of Defense (Acquisition, Technology and Logistics), sponsored the development of an online course for acquisition workforce personnel new to the international arena. A team was formed, chaired by a representative from the Office of the Director, International Cooperation, OSD, and comprised of subject matter experts from the Services' international program offices, OSD (Policy) Interna-

tional Security Programs, and the DAU International Department. The contractor chosen to build the online training was Meridian Knowledge Solutions, Inc., Chantilly, Va.

The course is divided into three two-hour parts, and was based upon the OSD *Armaments Cooperation Handbook*. While the last official version of the handbook was released in 1996, a completely updated draft version was used to build the course, thus making it even more current than the available handbook. Although primarily intended for acquisition workforce personnel, Security Assistance and Foreign Disclosure personnel who play some role in international cooperative programs could benefit from the course as well. The International Armaments Cooperation online course prepares learners for instructor-led, classroom-based courses held at DAU, Fort Belvoir, Va. A certificate of completion is available at the successful conclusion of the course and post-test.

Editor's Note: Readers are encouraged to visit the DAU international Web site at <http://www.dsmc.dau.mil/international/international.htm> and register for the new International Armaments Cooperation online course.

DEFENSE MEDICAL LOGISTICS STANDARD SUPPORT PROGRAM WINS INTERGOVERNMENTAL SOLUTIONS AWARD

WASHINGTON (June 11, 2002) — On behalf of the Department of Defense, Debra Bonner, Director of Operations for the Defense Medical Logistics Standard Support (DMLSS) Program Office, accepted the Federation of Government Information Processing Council's Intergovernmental Solutions Award for 2002 recently at the XXII Management of Change Conference in New Orleans, La. The award recognized DMLSS as one of the premier medical logistics information systems in the United States.

The DMLSS Program Office, managed by Col. Dan Magee, and the Defense Supply Center—Philadelphia (DSCP) developed a state-of-the-art technical solution

that improves medical logistics responsiveness at reduced costs and provides a high quality, integrated system to DoD health care providers at more than 500 medical treatment facilities worldwide in peacetime and contingency operations.

According to the latest DMLSS economic analysis, the taxpayer has saved \$5.98 for every \$1 invested in the development, deployment, and sustainment of the total DMLSS program worldwide.

The DSCP manages the wholesale portion of the DMLSS program. Currently, the Department of Veterans Affairs (VA) is considering modifying one of the DMLSS wholesale tools to enable Federal

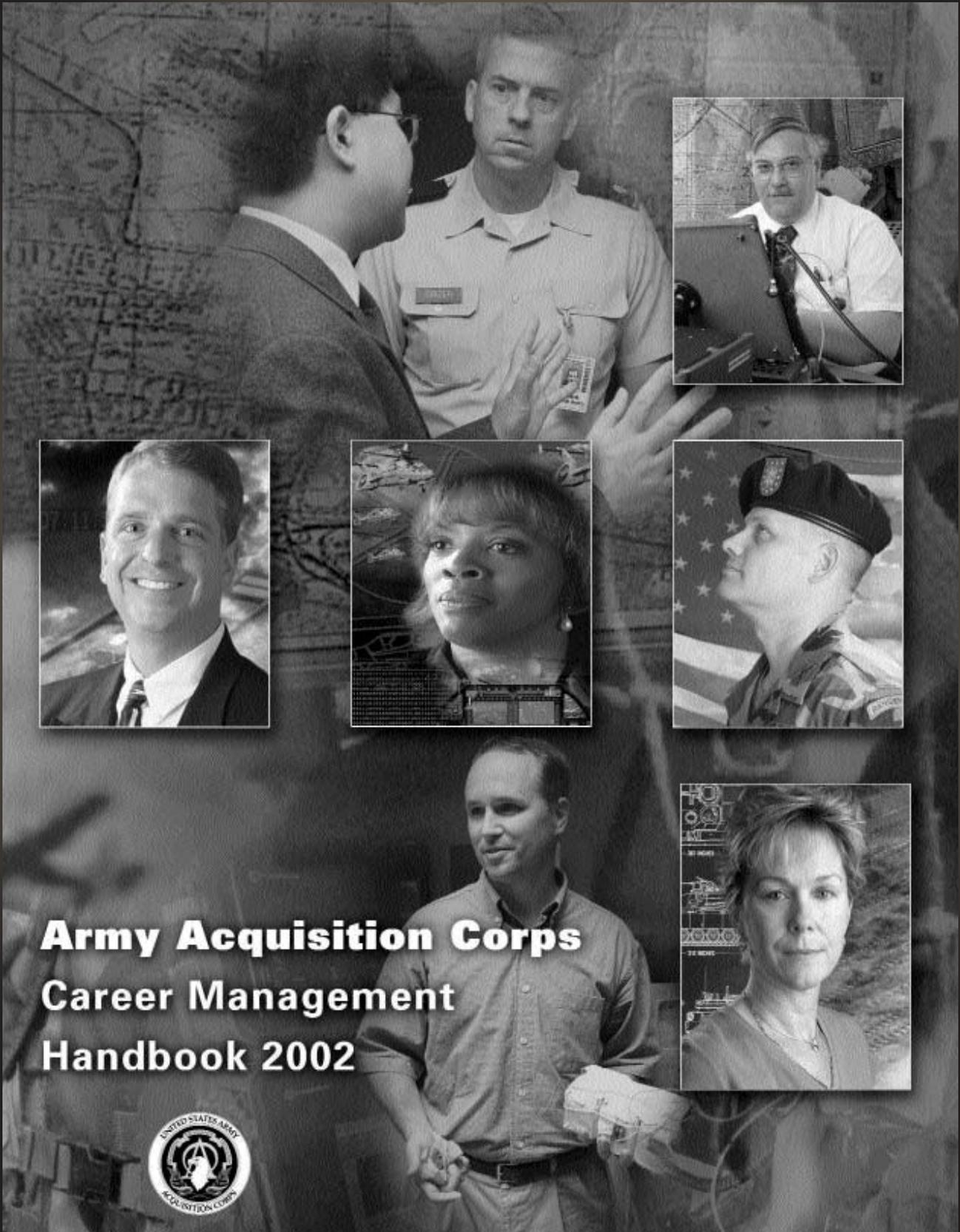
Supply Schedule contractors to enter data into the National Item Record for VA use.

The award, sponsored by the Federation of Government Information Processing Councils, recognizes programs or projects with information technology solutions that have demonstrated intergovernmental involvement in delivering services to citizens.

More information about DMLSS can be found at <http://www.tricare.osd.mil/dmlss>. More information about the Defense Supply Center—Philadelphia is at <http://www.dscp.dla.mil/>.

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

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Non-Lethal Weapon Human Effects

Establishing a Process for DoD Program Managers

SUSAN D. LEVINE • MAJ. NOEL MONTGOMERY, USAF

A new class of weapons is proceeding through the acquisition process that will ultimately provide the warfighter in the field with a much needed capability to “fill the gap” between a military mission of presence (show of force) and lethal firepower. This new class of weapons—known collectively as non-lethal capabilities—is intended to provide our political and military leadership with additional options in missions ranging from peacekeeping to major theater war. Included are counter-personnel non-lethal capabilities, with wide-ranging applications typical of the following:

- Incapacitating personnel participating in a riot.
- Clearing volunteer human shields from a potential military target.
- Counter-material capabilities for neutralizing facilities or equipment, with minimal collateral damage to personnel and the environment.

The development of non-lethal capabilities has brought with it new challenges to the DoD acquisition community and the program managers who are tasked to develop weapons that are both effective and primarily non-lethal against the span of the human population. This article describes the complexity of the human effects challenge and the development and implementation of a pilot program, instituted by the DoD Joint Non-Lethal Weapons Program (JNLWP), to standardize a process for human effects characterization of non-lethal weapons.

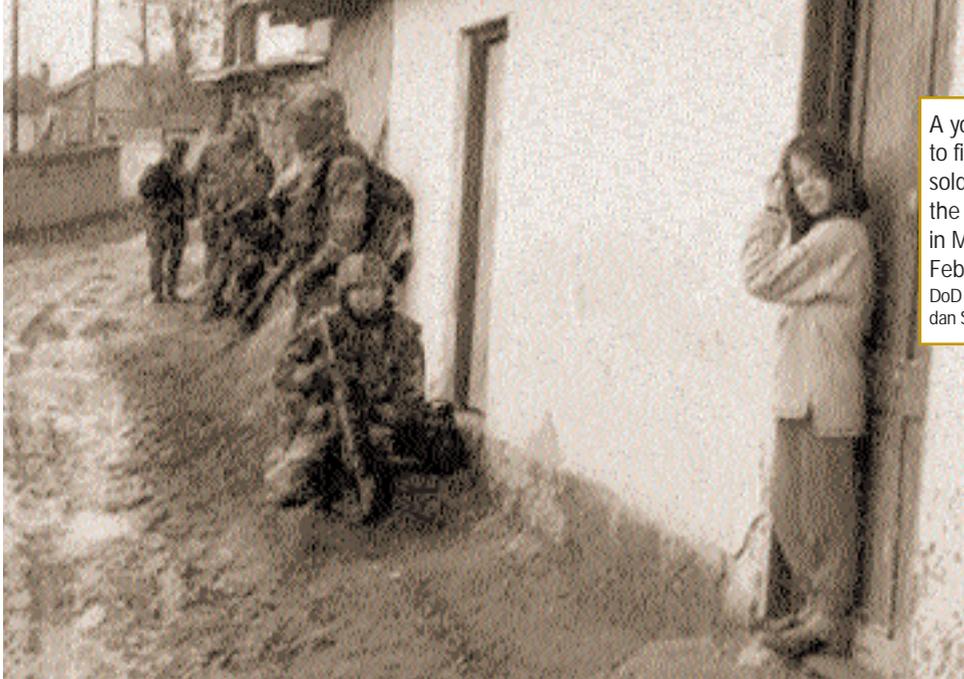


Soldiers of the 504th Parachute Infantry Regiment maintain crowd control as residents of Vitina, Kosovo, protest in the streets on Jan. 9, 2000.
DoD photo by Army Spc. Sean A. Terry



Marine Gunnery Sgt. William Post (center) marches with the local children down the main street of Zegra, Kosovo, on June 28, 1999.
DoD photo by Marine Sgt. Craig J. Shell

LeVine is the Deputy Director, Joint Non-Lethal Weapons Directorate (JNLWD), Technology Division, U.S. Marine Corps, Quantico, Va. She holds a B.S. and M.S. in Physics from the University of South Carolina. Montgomery recently completed an assignment as the JNLWD Health Effects Officer. He holds an M.S. in Health Physics certification from the American Board of Health Physics.



A young girl is amused to find U.S. Army soldiers lined up against the walls of her house in Mitrovica, Kosovo, on Feb. 21, 2000. DoD photo by Army Sgt. Brendan Stephens

A Complex Challenge
Non-lethal weapons, as defined in DoD Policy Directive 3000.3., *Policy for Non-Lethal Weapons*, dated July 9, 1996, are:

“... weapons that are explicitly designed and primarily employed so as to incapacitate personnel or materiel, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment.”

While DoD policy makes it clear that the qualitative term “non-lethal” prescribes intent and is not meant to imply that non-lethal weapons will be non-

lethal 100 percent of the time against 100 percent of the human population, clearly, some type of quantitative definition or risk factor must be associated with non-lethal weapons so that the field commanders who order their employment will have an understanding of the risk associated with their use.



Air Force Brig Gen. Paul Nielsen, Air Force Research Laboratory, and Marine Col. G.P. Fenton, Director, Joint Non-Lethal Weapons Directorate, preside at the Human Effects Center of Excellence (HECOE) Ribbon Cutting and Memorandum of Agreement signing ceremony, June 7, 2001, at Quantico, Va. USAF photo by Dr. Michael Murphy

Additionally, program managers responsible for non-lethal weapon capabilities must have criteria thresholds to design and test against. Essentially, what does “non-lethal” really mean, and how do you test something to validate it as being “non-lethal”?

Many factors are associated with quantifying non-lethal weapons effects and effectiveness.



A Military Police squad from the 709th Military Police Battalion crosses a bridge in Sevice, Kosovo, where several hundred Kosovar Serbs were blocking the road on April 4, 2000. DoD photo by Army photographer Drew Lockwood

Diversity of Non-Lethal Weapons Technology
First, the types of technology associated with or proposed as non-lethal weapons are diverse, ranging from the relatively low-tech, ki-

“Safeguarding Peace—Safeguarding Life”



The JNLWP was formed to coordinate and integrate the development of all non-lethal weapon programs and activities in DoD. The JNLWP logo has a shield as a symbol of protection. A sword poised in a downward position representing non-lethal military protection of life and peace separates the four stars—one for each of the Services. The four stars are white, and the two halves of the shield are red and blue to represent the United States of America while the olive branches are symbols of peace. The insignia is presented over the earth, symbolic of our global commitments. The Latin motto, *Pax Custimus—Vita Custimus*, is loosely translated as “Safeguarding Peace—Safeguarding Life.”

netic, or blunt impact munitions, entanglements, and malodorants; to the more high-tech directed energy technologies such as millimeter wave electromagnetic energy and dazzling light.

Human Physiology

A second factor is the diversity of the human population and variations in physiology associated with age, gender, and even “average” individual health.

Uncertain Conflict Scenarios

Third is the number of varying situations in which non-lethal weapons may be employed. For example, troops protecting food stations may be faced with

more women and children than those in another scenario protecting a facility from a crowd of predominately male rioters.

All of these factors are relevant and contribute to the complexity of the problem. Accordingly, it is unrealistic to believe that a non-lethal weapon program manager will be able to build a weapon, test it, and determine with absolute certainty how well or poorly it will perform against its intended targets. The quandary is that this is exactly the type of information field commanders need to make educated decisions on its use.

Developing a Credible Process

The challenge is development of a process that will allow testing and validation of non-lethal effects and effectiveness that will give users and policy makers the confidence they need to employ these capabilities. This challenge is even more complicated by the fact that weapon system program managers in DoD historically have earned their degrees in engineering or physics, without any significant training in the medical sciences; and that traditionally, they have focused their work toward the goal of maximizing the probability of kill of a given weapon system.

Recognizing these challenges, in the summer of 1999 the Chair of the JNLWP Integrated Product Team (IPT) asked the Service Acquisition Executives and Service Surgeon Generals to provide representatives to form a Human Effects Process Action Team (HEPAT). The purpose of the HEPAT was to develop a process-based approach that non-lethal weapon program managers could use during the weapon development process.

The HEPAT met diligently for seven months, becoming familiar with the different non-lethal weapon programs and technologies, the various methods that existing non-lethal weapon program managers were using to assess non-lethality, and deliberating the common process that should be used by all DoD non-lethal weapon program managers.

From their deliberations, the HEPAT quickly recognized challenges in three distinct areas with respect to quantification of the human effects and effectiveness of non-lethal weapons.

No Assessment Process or Guidance

No published acquisition policy or guidance exists, in any DoD component, that requires program managers to characterize effects of non-lethal weapon systems on their targets. Program managers must rely on their own discretion to determine the approach for characterizing the effects and effectiveness of their non-lethal weapon systems.

State of the Science

The HEPAT reviewed ongoing non-lethal weapon acquisition programs (mostly blunt impact weapons) and the tools available for predicting their effects.

RUDIMENTARY EXISTING MODELS

At the time of the HEPAT's assessment, the only existing models for predicting blunt trauma injury were very rudimentary and based largely on data from the automotive industry. Models did not exist for the potential impact of bodily injury to major organs, nor were there mechanisms for coping with such injuries. In addition, models did not take into account the impacts of bodily injury on the young vs. the old.

EDUCATED ASSUMPTIONS

Models predicting blunt impact weapon effectiveness or human response were non-existent. Further, they were not validated for predicting injury caused by small, fast projectiles from non-lethal weapons. The first fielded weapons were assessed based on experience of law enforcement and educated assumptions on the part of the program managers.

DIFFICULTY IN DEVELOPING MODELS

Program managers of less mature weapon technologies (e.g., directed energy), because of their longer development timelines, have more lead time before fielding. But without expert help, they will also have difficulty assembling the data and developing the models needed to facilitate employment and acquisition decisions.

No Organization to Perform Assessments

The organizations that have developed some of the most promising injury prediction models are prohibited by their medical research mission and command policy from performing weapons effectiveness assessments for the non-lethal weapon developers. No organization within the Services or the DoD exists, with both the responsibility and expertise to provide technical research, analysis, or advice to the non-lethal weapon program managers for non-lethal weapon human effects characterization.

In addition, no single organization or agency reviews the data outputs of the characterization processes and ensures that they are adequate and that the data are presented in a manner useful to the Milestone Decision Authorities (MDAs) and weapon users.

Developing a Solution

The HEPAT identified three critical elements for establishment of a DoD non-lethal weapon Human Effects process. These include an independent review process, establishment of centralized human effects expertise, and use of a risk assessment approach for characterizing the effects and effectiveness of non-lethal weapons.

Independent Review

The HEPAT concluded that an independent review of the human effects characterization efforts for each non-lethal weapon program would be critical to its successful development and employment. Accordingly, the HEPAT examined several existing processes within the DoD for providing independent review of technical, health, or safety components of acquisition programs and decided to focus on the Navy's Weapons Systems Explosive Safety Review Board (WSESRB) process.

The WSESRB reviews testing and evaluation that has been conducted on explosives that will be stored and transported aboard Navy ships. As such, members of the board provide advice and guidance to program managers and MDAs who review the WSESRB assess-

ments during the milestone decision process. The HEPAT focused on this process because of two desirable characteristics: independence from the weapon developer and the credibility that the WSESRB has obtained within the Navy over the last 30 years (essentially no explosive goes on a Navy ship without a WSESRB review).

Analogously, the HEPAT recommended establishment of a Human Effects Review Board (HERB) for non-lethal weapons. The HERB would review the human effects data available on each non-lethal weapon system, assess and quantify the significant risks associated with the weapon system (including the risk that it will not be effective), and provide recommendations to the program manager and MDA that they can follow to adequately quantify and/or reduce the risk. The HERB's recommendations are intended to be considered as part of the milestone decision process for each weapon system.

Human Effects Support for Program Managers

Having determined an approach for independent review of human effects characterization, the HEPAT focused on the challenges that program managers face in analyzing and characterizing human effects. In the absence of any recognized DoD organization chartered with the human effects research mission and possessing the needed expertise, the HEPAT identified the need for a central focal point for non-lethal weapon human effects work. The HEPAT recommended the establishment of a DoD Human Effects Center of Excellence (HECOE) with the mission of aiding non-lethal weapon program managers in all facets of human effects planning, analysis, and testing.

The HECOE would serve as a repository of existing data and information, a resource to help program managers determine the appropriate research approach, and a resource to identify researchers from within DoD, academia, and the private sector. Further, the center would assist the program manager in research and data collection on human effects.

The HEPAT recommended the Air Force Research Laboratory Human Effectiveness (AFRL/HE) Directorate, Radiofrequency Radiation Branch, serve as the DoD non-lethal weapons HECOE. This organization was recommended due to its existing weapon development mission, biomedical expertise, and proven track record of non-lethal weapon development with the Active Denial Technology Program. Additionally, AFRL/HE is co-located with Army and Navy units as part of the Tri-Service Directed Energy Bioeffects Laboratory. The Army and Navy units have medical expertise to assist in a number of health protection areas and lend a critical multi-Service flavor to the organization.

Risk Assessment Approach

To address the challenge of adequately characterizing the effects and effectiveness of non-lethal capabilities against the span of the human population when it is not practical to collect complete test data, the HEPAT recommended that a risk assessment approach be used in describing the effects and effectiveness of non-lethal weapons. This is advantageous because military leaders make decisions based on risk; non-lethal weapons effects lend themselves to risk assessment since they are subject to physiological and psychological variability. A range of weapons, from lethal to non-lethal, can be compared using relative risk.

Implementing a Human Effects Pilot Program

The HEPAT's recommendations were unanimously endorsed by all Service Surgeon Generals and Service Acquisition Executives. After endorsement, implementation began almost immediately in September 2000, when the Joint Non-Lethal Weapons flag-level Integrated Product Team approved a two-year pilot program to evaluate the recommendations.

The HERB was formed with representatives from each Service's medical and biomedical research communities and chaired by the Joint Non-Lethal Weapons Directorate Health Effects Officer. The board began its work by first

reviewing near-term Joint Non-Lethal Weapon acquisition programs, including the Modular Crowd Control Munition, 40 mm Non-Lethal Crowd Dispersal Cartridge, 66mm Vehicle Launched Non-Lethal Grenade, and Portable Vehicle Arresting Barrier. Currently, the HERB is reviewing concept exploration efforts and will provide recommendations on pre-Milestone A programs as they approach that milestone decision.

On June 7, 2001, the HECOFE was formally established at a Ribbon Cutting and Memorandum of Agreement signing ceremony. Setting to work immediately, the center started by defining a specific human effects characterization process for non-lethal weapon program managers, assisting acquisition program managers with effects assessment, working with concept exploration program managers to incorporate human effects in the concept exploration process, developing a master non-lethal weapon

human effects database, and defining a risk assessment framework to describe non-lethal weapon effects.

A Solid Foundation and Continuing Effort

With the recommendations of the Human Effects Process Action Team and the successful implementation of these recommendations during the two-year human effects pilot program, the JNLWP has laid the foundation necessary to ensure that non-lethal weapons have appropriate human effects evaluations conducted, and that these evaluations are carefully reviewed through an independent process.

The Human Effects Center of Excellence has been established as a resource to 1) assist non-lethal weapon program managers in characterizing human effects, and 2) serve as a focal point for DoD in non-lethal weapon human effects data collection. The Human Effects Review Board will continue to provide valuable

advice and recommendations to non-lethal weapon program managers and MDAs that will assist them in reducing risk and ensuring that the soldier, sailor, airman, or Marine who uses a non-lethal weapon can do so with the utmost confidence as to the effect on target and overall weapon effectiveness.

Next Step

The next step is to formalize the non-lethal weapon human effects characterization process in DoD acquisition policy and regulations so they become a standard part of all non-lethal weapon acquisition programs. All of these measures will help put DoD non-lethal weapons on a firm footing for the 21st century and beyond.

Editor's Note: The authors welcome questions or comments on this article. Contact **LeVine** at levinesd@jnlwd.usmc.mil. Contact **Montgomery** at Noel.Montgomery@langley.af.mil.

EDLINK

Defense Electronic Business Program Office Launches New eBusiness Education Web Site

Fulfilling its mission to accelerate integration of eBusiness techniques into DoD's operations, the Defense Electronic Business Program Office has launched **edLINK** to provide easy access to DoD eBusiness information. The **edLINK** Web site, <http://www.interactionnet.com>, is designed specifically to provide DoD educators with information that can easily be incorporated into current and future courses. Prime candidates include courses related to program management, contracting, logistics, supply, and supervisor or manager development.

In addition, the Defense Electronic Business Program Office provides a LIST SERVE, which complements **edLINK** and is a useful communication network for the exchange of eBusiness curriculum-related information among DoD's education com-

munity. To join the LIST SERVE, simply go to the **edLINK** Web site and follow the instructions provided.

As a DoD instructor, your support in promoting these eBusiness resources is vital. DLA welcomes your participation and anticipates that these tools will become a valued part of your academic endeavors.

For further information on **edLINK**, contact Stan Dubowski at stanley_dubowski@hq.dla.mil; or call 703-767-0614, DSN 427-0614. Any technical questions or suggestions regarding **edLINK** should be directed to Allen Van Brunt, DoD eBusiness Education Program Analyst, LLD, Inc., at avanbrunt@corp.ild.com; or 703-925-0660, ext. 540.

<http://www.interactionnet.com>

DAU RECEIVES CAREER CONNECTIONS AWARD FOR SUPPORT OF FAIRFAX COUNTY PARTNERS IN EDUCATION AND MENTOR WORKS AWARDS PROGRAM

On Feb. 3, the Defense Acquisition University (DAU) received the Career Connections Award during the Fairfax County Partners in Education and Mentor Works Awards Program ceremony, held at Edison High School Auditorium, Alexandria, Va. Among the 100 Business partners participating in the program, DAU-DSMC was recognized for outstanding support and partnership with the Bryant Alternative High School, Alexandria, Va.

For the past eight years, Bryant Adult Alternative High School has partnered with DAU, Ft. Belvoir, Va. At the start of each school year, a steering committee of 16 members from both Bryant Adult Alternative High School and DAU meets to develop the Partnership Plans for the school year. Over the past eight years, DAU has planned and participated in an average of 20 activities each school year on behalf of Bryant.

Many of the activities span the curriculum for career awareness, career exploration, and career preparation. DAU's major contributions to the partnership range from the plaques awarded three times a year at the Bryant Awards Assembly to students possessing the traits of leadership, scholarship, and service; to the Job Shadowing Program that

involves over 25 students shadowing a professional at DAU.

Other partnership activities include: Headstart Reading Program, Book Fair, Education Program for Equipment, Tutoring and Mentoring Program, Thanksgiving Food Drive and Pantry Food Collection, and Winter Coat Drive.

Bryant Adult Alternative High School is unique among the many high schools in Fairfax County. Its programs reflect the needs and the diversity of the student population. In recent years, every student and staff member has been influenced by one of the many partnership activities successfully completed throughout the school year, markedly improving the overall attendance, providing the venue for students to make the necessary and valuable connection between the school and the career, and providing the resources needed for the students to become well-rounded members of the community.

For more information about the DAU-Bryant partnership, contact Helen Haltzel, Director, Acker Library, at Helen.Haltzel@dau.mil; or call (703) 805-4555.



Air Force Col. William McNally, former Director, DAU Operations, displays the Career Connections Award earned by DAU volunteers for their active involvement in the DAU-Bryant Alternative High School Partnership. Pictured from left: Air Force Master Sgt. Rhonda Jenkins; Greg Caruth; Ed Boyd; Kay Sondheimer; Debbie Gonzalez; Kelly Long; Cathy Pearson; Linda Garnish; Helen Haltzel; Cheryl Clark; and Navy Petty Officer Carolyn Dickenson.

Reflections on Test and Evaluation (T&E)

T&E Infrastructure, Reengineering Army T&E, and Building a Viable Test Range Complex

JOHN F. GEHRIG • GARY HOLLOWAY • GEORGE SCHROETER

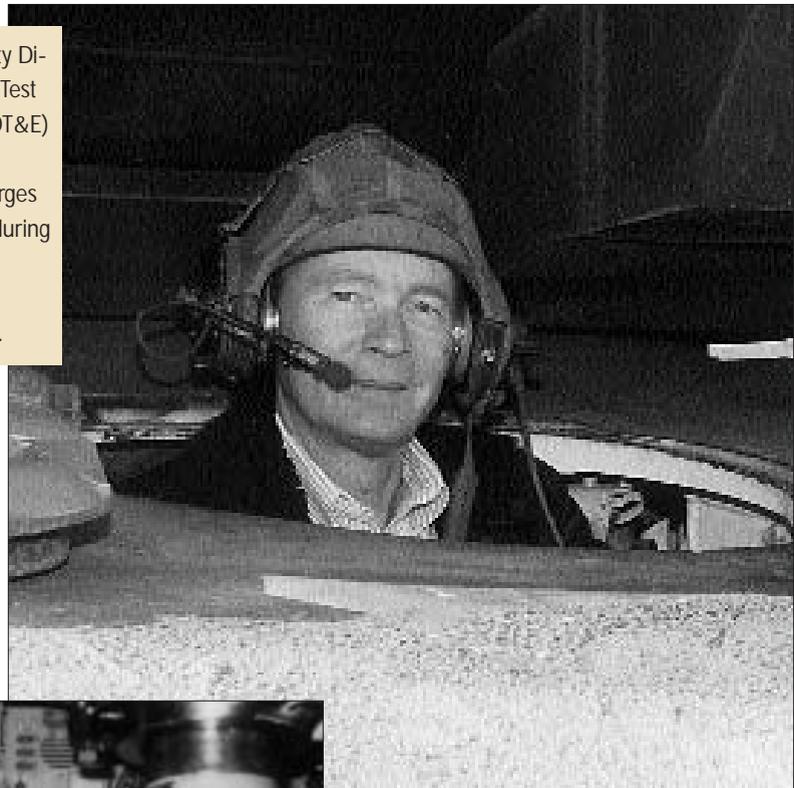
Having devoted a career to various aspects of Test and Evaluation (T&E) of Department of Defense weapon systems, we have enjoyed the good fortune of being able to work with many of the best and the brightest people in testing. Our experiences as testers, consultants, managers of test programs and facilities, and oversight of test ranges and programs have enabled us to interface with a large segment of the DoD T&E infrastructure. We have been fortunate to be involved in many studies on a multitude of T&E issues involving the best visionaries in government.

We could not emerge from the experiences and opportunities afforded by our lifelong careers as testers and evaluators without formulating several strong opinions concerning the direction of DoD T&E. In an effort to document several of these opinions and experiences, this article—the first of two entitled “Reflections on Test and Evaluation” covers three themes we have co-authored: State of the T&E Infrastructure, Lessons Learned in Reengineering Army T&E, and Critical Attributes for a Viable Test Range Complex.

State of the T&E Infrastructure

The T&E infrastructure is best viewed and assessed in the context of a mix of people, processes, and facilities. The health of that infrastructure, as DoD enters the 21st century, is an essential ele-

John Gehrig, Deputy Director, Operational Test and Evaluation (DOT&E) for Resources and Ranges, OSD, emerges from a tank turret during M1A2 Testing, Aberdeen Proving Ground, Md., 1999.



Gehrig tests the periscope systems aboard the *USS Nevada* Trident Submarine in 1986. All systems of the submarine are tested between missions.

Gehrig is Deputy Director, Operational Test and Evaluation (DOT&E) for Resources and Ranges, OSD. He is charged with the responsibility for ensuring that DoD has the T&E infrastructure required to test and evaluate the warfighting systems needed to prevail in increasingly complex battlefield environments. Holloway is an independent consultant supporting DOT&E. Prior to his retirement from government service in 1998, he was Director of Test Technology for the Technical Mission at the U.S. Army Test and Evaluation Command (TECOM), where he was responsible for TECOM's test range management, test technology, and information technology programs. Schroeter previously served as Chief of Plans, Analysis, and Evaluation, Office of the U.S. Army Test and Evaluation Command, responsible for corporate planning, integrated programming, and concept development and implementation of command realignments/reorganizations. Upon his retirement from government service in January 1997, he has continued his involvement with DOT&E as a consultant to the Office of the Director, Operational Test and Evaluation.



swer crucial questions on system performance, operational effectiveness, suitability, and survivability. T&E facilities must be up to the challenge of testing the most advanced weapon systems and components as well as the complexities of testing “systems of systems.”

Gehrig participates in Small Arms Testing at Aberdeen Proving Ground, Md., 1999.



Gehrig (left) during F-22 testing at Edwards Air Force Base, Calif., 1998.

ment in ensuring the success of the ongoing “transformation” of the Department as reflected in DoD’s *Revolution in Military Affairs* and the *Revolution in Business Affairs*.

A balanced workforce made up of sufficient numbers of people with appropriate skills is the foundation of the T&E infrastructure. T&E business processes build upon this foundation to enable testers to accomplish their mission in an efficient and effective manner. T&E facilities must be efficient and capable of providing the necessary data to an-

All of these components must work together in a seamless and integrated manner to provide the support so crucial to the acquisition process. The following discussion provides a more detailed look at each of these infrastructure elements.

People

The T&E professional workforce is the T&E community’s greatest asset and its biggest cost driver. During the 1990s, a significant percentage of DoD’s most valuable and experienced T&E personnel were lost to retirement or higher-paying employers. In addition, hiring

and promotion freezes, personnel draw-downs, contracting out, and limited funding made the hiring and promotion of outstanding, younger members of the workforce difficult. Consequently, the T&E community faces a major challenge in its ability to attract and retain the best and brightest of available technical experts.

Between fiscal 1990 and fiscal 2000, the Major Range and Test Facility Base (MRTFB) workforce was reduced by approximately 5,100 people (31 percent) while workload remained steady. This reduction is roughly equivalent to the reduction in workforce caused by four base closures. While some of these reductions were made possible by investments that enhanced efficiency, allowing facilities to operate with fewer people, many resulted in a loss of capability at our T&E centers.

We have also seen a 30 percent decrease in the number of military personnel at MRTFB activities since fiscal 1990. While the migration of military personnel back to combat units contributes to today’s readiness, the loss of military personnel from the T&E community will have an unintended and undesirable long-term effect on the ability of T&E to support the acquisition of future weapon systems that contribute to tomorrow’s readiness.

These problems are not limited to the government workforce. The contractor workforce has also been significantly cut. Since 1990, over 4,300 contractor jobs have been eliminated at MRTFB activities alone. Our contractors are also facing similar problems retaining and hiring employees. For example, the Atlantic Undersea Test and Evaluation Center has experienced an attrition rate between 20 and 40 percent among its contractor workforce in recent years. This attrition rate is in response to funding cuts aimed at reducing cost, quality-of-life issues, and long-term career concerns.

The T&E community also shares the Federal Government’s overall problem of an aging workforce. Since fiscal 1990,

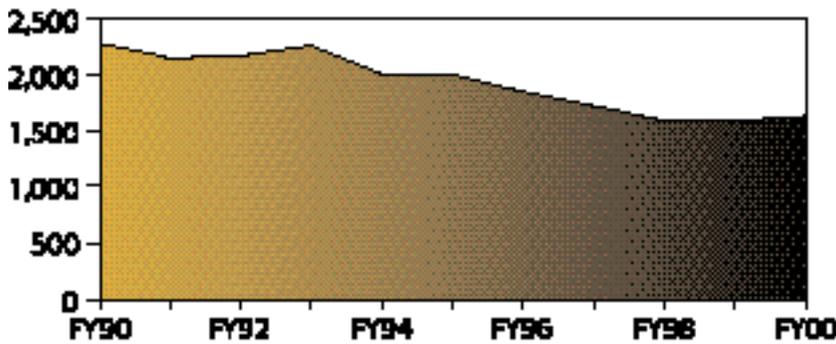
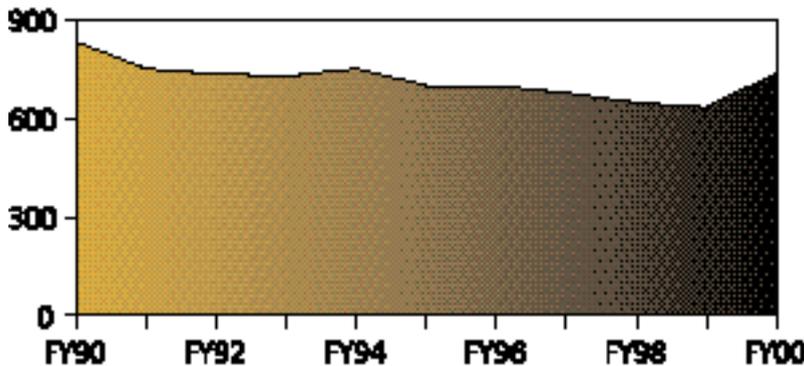


FIGURE 1. T&E Infrastructure Funding (Constant Fiscal 2001 \$M)

FIGURE 2. T&E Investment Funding (Constant \$M)



the number of Operational Test Activity civilian professionals (GS-12 through GS-15) in the 45 to 60 age bracket has increased from just over 50 percent in fiscal 1990 to nearly 65 percent in fiscal 1998. Civilian professionals under age 45, who had constituted about 45 percent of the professional workforce in fiscal 1990, now account for fewer than 30 percent.

Finally, the T&E workforce has experienced a gradual degradation of technical skills relative to the leading edge of technology over the past decade. This decline can be attributed to the retirement of the more experienced T&E workforce and the extremely limited infusion of recent college graduates trained in state-of-the-art technology and techniques.

Processes

The T&E community has struggled to offset limitations in manpower and facilities through business process reengineering, and has done a tremendous job of streamlining processes through:

- leveraging technology to improve the efficiency and productivity of our facilities;
- partnering with other government agencies, industry, and our allies to leverage each others' facilities; and
- reengineering our business processes to improve performance and provide more affordable testing through better business practices.

However, a decade of reductions and reengineering with limited investment in facilities has brought the T&E community to a point where it can no longer offset limitations by further business process reengineering initiatives alone.

Facilities

The last decade has seen a significant deterioration in the facilities at our test ranges. The average age of T&E facilities is now well over 40 years, and more than two-thirds of them are over 30 years old.

During the last 20 years, DoD's investment rate for T&E facilities has been less than one-third the rate of invest-

ment in private industry on an order of magnitude below the investment rate for high-technology industries. Military Construction funding for T&E facilities at the MRTFBs is down 76 percent since 1990. Our current investment level for Military Construction equates to a replacement rate of 500 years compared to industry rates of 20 to 40 years. Overall, investment funding is down by 10 percent since fiscal 1990.

State of T&E Funding

With downsizing and reduction, funding for infrastructure has been viewed as less important than funding for weapon system procurement. Infrastructure, in general, is considered to be part of the "tail," not part of the "teeth" of the fighting force. In fact, T&E infrastructure is far from the "tail." T&E, along with military training, is what sharpens the teeth and keeps them sharp. T&E is also how we know how sharp the "teeth" really are. In the desire to increase the "tooth to tail" ratio, T&E infrastructure modernization and funding continue to suffer.

The effects of T&E resource shortfalls are becoming increasingly acute. Obsolete facilities and equipment increasingly fall short of data collection requirements. The T&E infrastructure—its people, processes, and facilities—is under great stress.

Figures 1 and 2 help to illustrate the root cause of today's T&E shortfalls. The T&E infrastructure funding has dropped 28 percent, and the T&E investment funding has dropped 10 percent below the fiscal 1990 level as of fiscal 2000. These decreasing funding trends are exacerbated by the fact that T&E did not share in the build-up of Research, Development, Test and Evaluation (RDT&E) that peaked in the late 1980s.

The ongoing military transformation requires the T&E community to be prepared to test more sophisticated systems employing more advanced technology. Without the resources and funding required to sustain, maintain, and modernize T&E, we face the inescapable conclusion that T&E will reach a point

in the foreseeable future where the quality of testing and the information provided will deteriorate below reasonable and acceptable limits.

The ongoing military transformation is also changing the emphasis in military operations to interoperability, systems-of-systems, and information systems. As a result, systems can no longer be tested only in a stand-alone configuration but must be tested with multiple other systems, thereby increasing the complexity of the tests and straining the capabilities of existing facilities. Meeting these challenges will require new investment in T&E capabilities and facilities to ensure the T&E community is prepared to support our nation's defense readiness.

Lessons Learned in Reengineering Army T&E

A historical look at the evolution of T&E in the Army over the last 40 years provides a spectrum of opportunities and pitfalls that must be critically evaluated in formulating a cost-effective path for the future.

Organizational Evolution

The major reorganization of the Army in 1962 took the fragmented and proliferating T&E assets in the Army and consolidated them into a single command, namely the Army Test and Evaluation Command. In August 1962 and continuing over the next eight years, a collection of 44 organizations and 24,500 personnel was streamlined into 15 organizations and 14,000 personnel. Most of this consolidation was accomplished by 1966.

In the early 1970s, the Army Operational Test and Evaluation Agency was created to be the independent operational tester and evaluator.

T&E Reengineering

In fiscal 1995, the Army initiated a T&E reengineering study of Army T&E *using classic reengineering techniques that looked at process rather than organization*. The end result, however, is the basis for the Army decision process that by fiscal 1999, reconfigured the Army T&E as-

Infrastructure, in general, is considered to be part of the "tail," not part of the "teeth" of the fighting force. In fact, T&E infrastructure is far from the "tail." T&E, along with military training, is what sharpens the teeth and keeps them sharp. T&E is also how we know how sharp the "teeth" really are.

sets into a single command—the Army Test Command.

The following discussion highlights the critical steps in the study team deliberations that were essential in evolving a reengineered T&E process. The study participants were veterans at realignment and consolidation studies in Army T&E. This reengineering exercise demanded that each member of the study team take an introspective look at a new process—a process devoid of the organizational policy and practices that each brought to the table. Yet each member had fundamental and detailed knowledge of the T&E process and under-

stood how it integrated into the materiel acquisition process.

In retrospect, when examining the reengineering end product and the steps to its development, it seems now to be a routine exercise. *Classic reengineering techniques were employed*, but developing the rapport and mutual understanding absolutely necessary for thorough process development, based upon each study team member's experience, was anything but routine.

The following discussion briefly describes the players, the problem, the vision, the traditional and reengineered processes, the decision levels in implementation, and the Army incremental decisions.

THE PLAYERS

In view of the T&E evolution described previously, the study team required members from a number of organizations. The members included T&E professionals from all walks of the Army T&E community:

- the operational evaluator;
- the operational tester;
- the developmental evaluator (multiple, since the mission was fragmented by materiel system designation);
- the Army Research Laboratory testers and evaluators (multiple);
- the Research, Development and Engineering Centers (evaluation support to the Program Managers/Program Executive Officers, and selected in-house test capabilities);
- the test instrumentation Program Manager (PM for the procurement of major instrumentation, targets, and threat simulators);
- the Training and Doctrine Command (requirements generator for new materiel acquisition systems); and
- Headquarters Department of the Army.

THE PROBLEM

Classic reengineering requires a statement of the problem. In simplest terms, the T&E customer perceived that testing was too expensive, and did not maximize value added to the program. Con-

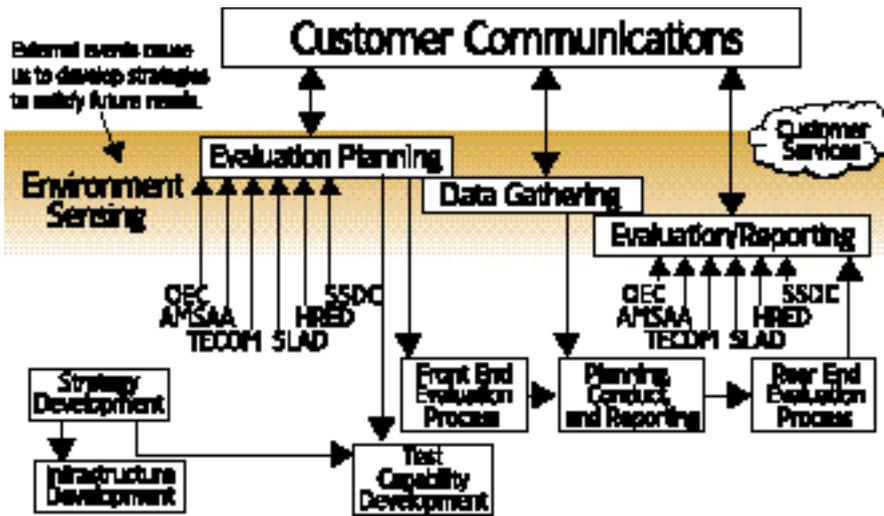
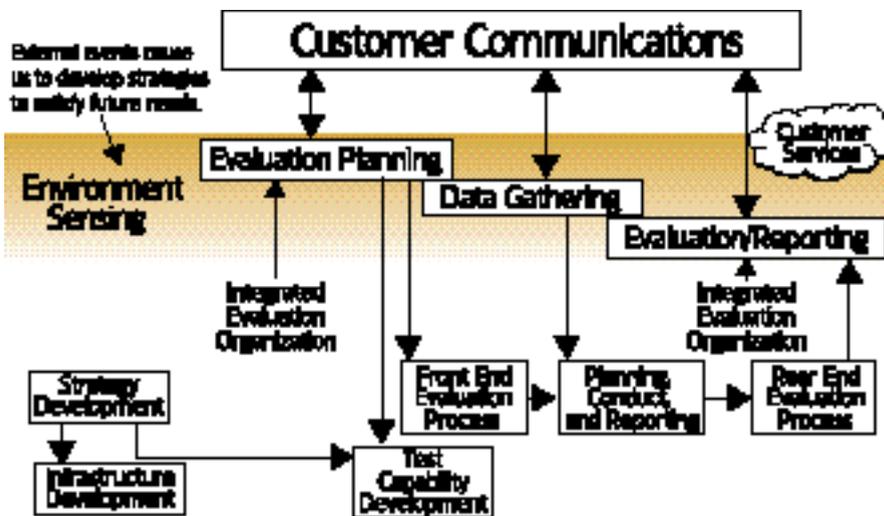


FIGURE 3. T&E—Traditional Process

FIGURE 4. T&E—Reengineered Process



sequently, the customer was eliminating testing, going to other sources for testing, and in some cases, creating similar and redundant test capabilities. The symptoms of the current process shortfalls were:

- multiple T&E planning documents;
- multiple independent tests; and
- multiple (maybe conflicting) reports.

Success criteria for reengineering T&E were established to assess how well these symptoms could be resolved by process improvements and organizational alternatives. Selected major criteria included:

- a simple flexible process;
- an integrated evaluation objective;

- integrated data collection
- reduction of organizational barriers;
- clearly defined links to technology and the requirements generation process; and
- appropriate T&E infrastructure.

THE REENGINEERING VISION

The study team vision embodied three basic concepts.

- First, that the T&E community's services are valued and sought by the customer.
- Second, that the T&E community actions are characterized as: 1) employing a disciplined yet flexible process, (2) embodying teamwork, (3) exuding mutual trust and common sense, 4) maximizing information

sharing, and 5) controlled by an appropriate level of oversight.

- The third vision concept requirement was that the process be robust, responsive, and efficient, providing critical information using a balance of modeling and simulation, experimentation, and testing and analysis in support of: 1) requirements generation, 2) system development, and 3) decision making at all levels.

THE TRADITIONAL T&E PROCESS

Figure 3 scopes the traditional process. The three major steps in the T&E process are:

- evaluation planning (what data do I need to prove or disprove my hypothesis);
- data gathering (historical data, testing, modeling) in response to the planning documentation; and
- analyzing and reporting or documenting the results (assessment of the system capability against requirements and issues).

Although the process shown in Figure 3 looks simplistic and intuitive, in retrospect it was not so when the paper was blank. The interaction of the diverse team members, each one expounding upon his or her particular slice of the pie, crystallized this schematic to one where each could accurately identify his or her process and products.

Looking at the many evaluation elements depicted in Figure 3, the most evident factor is that there are multiple players, and integration is not mandated by the policies/procedures that assigned these organizations their mission responsibilities. This is particularly important when one realizes that it is the evaluator who scopes the data requirements and consequently scopes the workload of the data-gathering element. This is significant since the data-gathering element is the cost driver for this process.

This concept is no surprise. In fact, this shortfall has been identified in the past and is best depicted in the findings of a 1984 Government Accounting Office

report to the Army. That report found three significant shortfalls:

- Each evaluation organization looks at only part of the system under test.
- Fragmented evaluation fails to disclose the collective impact of overall system deficiencies.
- The Army needs to integrate and interpret findings. This problem clearly has been overcome on selected systems over the last 25 years but *not* in a systematic manner.

Another factor that is embodied in Figure 3 is the lack of a single face to the customer. The customer (traditionally the Program Manager/Program Executive Officer) is often confronted with multiple independent demands to fund the data requirements generated by the independent evaluations. They often receive reports that provide conflicting statements of system capabilities, which are triggered by the current compartmented and fragmented evaluations that are mandated by policy.

The following discussion focuses on the redesigned T&E process. The testing concept is the same in both Figures 3 and 4, although the drivers are substantially different.

THE REENGINEERED T&E PROCESS

The reengineered T&E process is depicted in Figure 4. From the evaluation perspective, the basic change was to create an integrated evaluation process from the fragmented evaluation responsibilities that currently existed. This new process set the stage for an integrated evaluation plan and report. Once this process was defined and understood, the plan to create an organization to execute the process was developed. This provided a single face to the customer, simplified the interface and products to the customer, and streamlined the data requirements placed upon the test organizations, thereby reducing the overall test cost and time to the customer.

From a test organization perspective, the major benefit derived from the reengineered process was the creation of an integrated strategy for the development and

maintenance of the test instrumentation and range infrastructure necessary to support the materiel acquisition process in a timely manner. The flexibility afforded by having a single organization to plan and prioritize the infrastructure investments overcame a major roadblock in the current fragmented funding allocation process. Integration of the Army testing assets within a single command allowed cost-effective realignment of capabilities over time.

Implementing Options

One of the major stumbling blocks in any change to current operations is the cost and disruption caused during transition. To soften the impact of this transition, the Army employed three implementing stages in reengineering its T&E assets.

- The first stage, *functional realignment*, assigned and realigned specific functions within the existing organizational structures.
- The second stage, *organizational realignment*, combined organizationally but allowed organizations to remain at current locations.
- The third stage, *physical move* (not yet fully implemented), combines organizationally and consolidates at appropriate locations.

A NEW ORGANIZATION

The Vice Chief of Staff of the Army approved the reengineering of Army evaluation assets and implemented a functional consolidation on Feb. 29, 1996. Subsequently, on June 12, 1996, the Vice Chief of Staff of the Army approved a realignment of several Army Materiel Command organizational elements into the Operational Test and Evaluation Command. The realigned organizational elements included: the Army Materiel Systems Analysis Agency, the Test and Evaluation Command, and the Army Research Laboratory Survivability/Lethality/Analysis Directorate.

The new organization, renamed the Army Evaluation Command, became operational on Oct. 1, 1996. Although the personnel relocation (the third implementation stage, has not yet been

fully implemented, on Oct. 1, 1998, the Army officially stood up the Army Test and Evaluation Command. This command comprises the Developmental Test Command (formerly the Test and Evaluation Command less the garrison function at Aberdeen Proving Ground), the Operational Test Command (formerly Test and Experimentation Command), and the Army Evaluation Command.

The Future

The T&E downsizing and organizational consolidation lessons learned by the Army could serve as a barometer to evaluate other T&E assets in DoD. The Navy and the Air Force have undergone comparable reductions to the Army and are also at or below core capability levels. Army reengineering lessons learned may provide additional avenues of study for these Services. As integration has been demonstrated to be a key ingredient in the Army's T&E Reengineering process, an integrated effort of all of DoD T&E assets may hold the promise of maintaining core capabilities at affordable resource levels.

Critical Attributes for a Viable Test Range Complex

In the pursuit of a single measure of goodness, we often create a concept that seems a reasonable descriptor, but falls woefully short when the implications of its controlling elements are examined. A prime example is using the measure of capacity as the primary decision-making criterion for the DoD test range complex, specifically during the Base Realignment and Closure studies of the 1990s.

Historically, this measure has attempted to reduce the decision to a simple equation that says: "How much work was accomplished in a prior historical period (typically the last five years) vs. how much workload is projected for a future time period." This approach leads to arriving at an incorrect conclusion: that as soon as workload declines, excess capacity has occurred and, therefore, downsizing is in order.

The underlying reason for this incorrect conclusion is basically that some capa-

bilities must be maintained even though they may lie dormant for extended periods of time. Correspondingly, a valid basic set of criteria for evaluating needed capability has not been used, or even developed. We have failed to properly evaluate the critical conditions that must exist to allow specific workload to be accomplished in the first place. The five critical conditions, or parameters, that define the test space are: 1) geography, 2) climate, 3) control of the environment, 4) extendibility of the test space, and 5) facilitization and skill base.

The parameter facilitization and skill base includes the essential people, processes, and facilities to conduct the test. More specifically, these capabilities can include instrumentation, support facilities, test processes, and the skilled people to conduct proper testing.

Consider a construct for a viable DoD test range complex that encompasses the preceding five parameters. The first four are anchor criteria, representative of those reasons that DoD sites were initially selected for testing. The fifth criterion is controllable in that facilities can be developed or expanded and people can be recruited or trained.

GEOGRAPHY

Geography considers the air, land, sea and space at a given site. Many of the DoD ranges were established to take advantage of unique areas with geographical features not readily available elsewhere. Specific criteria relate to the volume and character of physical space, i.e., land and sea surface/subsurface area as well as the air space above that surface that provides opportunity to conduct unconstrained operations for development and operational testing and training in a realistic natural, open-air environment.

Factors contributing to good geography would include unique land masses/formations, such as mountains or islands that accrue directly to test utility and the physical size of the schedulable test volume that encompasses footprint lengths and widths, extent of elevation, and depth of water.

CLIMATE

The parameter of climate considers the total collection of atmospheric conditions such as temperature, humidity, wind, visibility (fog/clouds/salt spray/dust) and precipitation, as well as their impact on facility requirements that allow the routine conduct of operations. A positive climate is one that does not adversely affect normal operations on an open range but also possesses desired climatic conditions to exercise specific envelopes of a test item.

CONTROL OF THE TEST SPACE

This is a parameter that allows assessment of the degree to which the physical, electronic, and safety devices are in place and operational. This control ensures that test operations will be conducted in a secure environment without interference or concern for personnel or objects foreign to the test operation. Consideration must be given to encroachment and the special relationships and agreements specific ranges have made with local, state, and federal authorities. Also to be taken into consideration are established commercial air and surface traffic periodicity, density, and projected growth.

EXTENDIBILITY OF THE TEST SPACE

The ability to extend the test space is also a critical parameter to future operations. Many of DoD's ranges have made special arrangements that have permitted the range to conduct inter-range scenarios where large extended footprints were critical to the test, but usually these arrangements have been developed for specific tests and projects. This parameter considers the ease to which these arrangements may be institutionalized to accommodate Joint Warfare exercises and broader missions or handle increased performance of systems.

Specific parameters of interest include the degree to which either the adjacent area to a range is accessible for use or the proximity to other range areas to conduct operations. Ease of extendibility should consider demonstrated surface or air inter-range operations that extend the test scenario and the inter-range control and simulation linkages.

FACILITIZATION AND SKILL BASE

This final parameter, or critical attribute, to a viable test range complex is controllable with proper funding and management. It measures:

- the degree to which physical space is instrumented to control and record accurately and timely the critical performance data of an operation;
- the degree to which a site/course/impact area is properly prepared and maintained for conducting and operating a test;
- the adequacy of the test support facilities for pre-test preparation and post-test analysis;
- the in-place processes necessary to conduct test operations; and
- the extent of expertise available to execute test operations.

This attribute represents the most flexible of the parameters in that it can be enhanced with the infusion of resources (dollars and people).

Adapting to the Technology Drivers

As technology drives the sophistication of weapon systems, the DoD test range complex of the future must adapt to the technology drivers. *The measure of capacity should not be a decision-making criterion and is inappropriate for treating these technology drivers.*

The preceding five attributes are the critical mechanisms that must be foremost in the decision process to shape DoD's future range complex. The Department must preserve, maintain, and protect those assets that are irreplaceable and foster their growth and development through modernization to support the testing demands of the future.

Editor's Note: The authors welcome questions or comments on this article. Contact them at john.Gehrig@osd.mil, gholloway@vzavenue.net, or geosmarm@worldnet.att.net. For those readers interested in reading the second part of this article, watch for "Reflections on Test and Evaluation" in the September-October 2002 issue of *Program Manager*.

DoD Wants to Accelerate Indirect Fires Technology

JOE BURLAS

WASHINGTON (Army News Service, May 16, 2002)—The Department of Defense wants the Army to lobby Congress to transfer all the funding for the recently canceled Crusader howitzer program to accelerate a number of current indirect fires research and development programs, according to a top DoD official.

Failure to do so could put the programs at risk because the Army plans to field its Future Combat System (FCS) during the same timeframe the indirect fires programs are currently scheduled for production, said Michael Wynne, Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics, during a May 15 Pentagon press briefing.

Those programs include upgrades to the currently fielded Paladin 155 mm howitzer, a family of satellite-guided Excalibur artillery munitions, Net Fires System, High Mobility Artillery Rocket System, Guided Multiple Launch Rocket System, and a lightweight 155 mm howitzer.

“We want the Army, and we are recommending to the Army, that they package up and recommend to Congress that we accelerate precision munitions and rockets, as we don’t want those ultimately competing with the Future Combat System, but basically enhancing the Future Combat System,” Wynne said.

With the exception of the lightweight howitzer, the programs are scheduled for production and fielding early next decade—about the same time the Army plans to have its first FCS rolling off the assembly line. The lightweight howitzer is already in production by a Great Britain defense contractor and in use by that country’s military.

Accelerated funding for the programs would mean they would be produced between 2006 and 2009—thus, lessening the chance of budget crunch with the FCS in later years, Wynne said.

The Principal Deputy said the indirect fires programs support DoD’s vision to have more precise fires on the battlefield with systems that can be deployed easier than current systems. He gave the example of using three Excalibur rounds to take out a training center in the middle of a city versus 150 rounds of what is currently available to do the same job. In addition to a smaller logistics tail to supply ammo, precision also means less collateral damage, he said.

Some of the funding already spent on the Crusader will be recaptured, Wynne said, as DoD plans to migrate some of the proven technologies it developed into Paladin upgrades.

“We are hoping that all \$9 billion (originally slated for Crusader development and fielding) will not only be returned to the Army, but it will be returned to Army artillery,” Wynne said. “And we have asked the Army if they would come forward with a plan to essentially reinvigorate all of these programs, accelerating them, and maintain control and monetary spending authority.”

Army Secretary Thomas E. White was given a May 20 deadline to return with an Army artillery modernization program that meets the DoD vision when he was informed of the DoD decision to cancel the Crusader May 7.

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

Pentagon Rolls Out 'Latest, Greatest Prototype' Soldier System

SGT. 1ST CLASS KATHLEEN T. RHEM, USA

WASHINGTON, May 23, 2002—DoD engineers are developing the 2010-era Objective Force Warrior even before the next-generation Land Warrior is fielded in 2004.

Project managers from the Natick Soldier Center in Natick, Mass., rolled out a prototype Objective Force Warrior for the Pentagon press corps today.

Project Engineer Dutch Degay called the prototype the “latest and greatest” individual soldier system. He explained the Army Chief of Staff, Gen. Eric Shinseki tasked the Natick lab to “completely rebuild the [combat] soldier as we know him.”

Historically, researchers have devised upgrades to current equipment. The Objective Force Warrior program tossed out the current system of individual equipment in its entirety and designed a new “integrated, holistic” system from the skin out, Degay said.

He explained that the Land Warrior system adds many new capabilities to the current system of field gear through an electronic component soldiers will carry.

The Objective Force Warrior system, scheduled for fielding in 2008, completely integrates these electronic capabilities. Degay explained that soldiers will never again have to wear cumbersome night-vision or infrared goggles or heavy laser training components on their helmets. These and other features—thermal sensors, day- night video cameras, and chemical and biological sensors—are fully integrated within the helmet. It also includes a visor that can act as a “heads-up



A mannequin wears the prototype Objective Force Warrior system. Photo by Sgt. 1st Class Kathleen T. Rhem, USA

display monitor” equivalent to two 17-inch computer monitors in front of the soldier's eyes. The uniform system is a multi-functional garment working from the inside out, Degay said. It incorporates physiological sensors that allow the soldier, the chain of command, and nearby medics to monitor the soldier's blood pressure, heart rate, internal and external body tempera-

ture, and caloric consumption rate. Commanders and medics can access the information through a tactical local area network.

Heat and cold injuries are responsible for a large percentage of casualties in both battle and training, Degay said. But if a medic can monitor a soldier's vital signs, many of these types of injuries can be prevented.

If a soldier is injured, medics can start making an assessment before they even get to an injured soldier. "And that saves time on the battlefield," Degay said.

The Objective Force Warrior system has a built-in "microclimate conditioning system." Degay explained the private climate-control system has a "spacer fabric" that's a little bit thicker than a regular cotton T-shirt. The garment has "capillaries" that blow hot or cold air through the system.

The system's many functions are powered by fuel cells, which Degay described as "cell phone batteries on steroids."

A primary concern in designing the Objective Force Warrior system is overall weight carried by individual soldiers. Soldiers on combat patrols in Afghanistan today typically carry 92 to 105 pounds of mission-essential equipment, Degay said. This can include extra ammunition, chemical protective gear, and cold-weather clothing.

The requirement for the Objective Force Warrior system is to weigh no more than 45 to 50 pounds. Many of the system's built-in functions do away with the need to carry extra equipment. The climate-control feature eliminates the need to carry extra clothing. The outer garment has some biological and chemical protection capabilities, reducing the need to carry extra protective gear.

"What we are trying to do at the very fabric uniform level is consolidate all those systems into

one so we lessen the overall bulk and weight" carried by soldiers, Degay said.

Anything else that's mission-essential but not built-in to the individual soldier system will be carried on a "robotic mule." Degay explained the mule is part of the system. Each squad will have one of the small, remote-controlled wheeled vehicles that can perform a multitude of functions for the soldiers.

"[The mule] will assist with not only taking some of the load carriage off the individual soldier, but [it] also provides a host of other functions," he said. "Primarily water generation [and] water purification. [It's] a recharging battery station for all the individual Objective Force Warriors in the squad. [It] acts as a weapons platform. [It] has day and night thermal, infrared and forward-looking imaging systems inside the nose of the mule, as well as chemical-biological sensors."

The mule can also communicate with unmanned aerial vehicles to give the squad members a true 360-degree image of the battlefield. Currently this capability isn't available below the battalion level, Degay said.

"It's a follower, and it can be manipulated and brought forth by any member of the squad," he said. "It's essentially a mini load-carriage system that's there for them all the time, which allows us to lighten the load for the individual soldier, but [the soldier] has resupply available at a moment's notice."

Degay said that in the past, such foresight and interchangeability has only gone into major weapons and vehicle platforms.

"Historically we have spent millions of dollars on platforms," he said. But, "the soldier is the centerpiece of our Army, and we are finally making that investment for [the soldier] individually."

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

TSARC—The Test Schedule and Review Committee

Army Synchronization of Resources to Operational Testing

LT. COL. PETER G. LAKY, USA • PHILLIP H. RILEY

Learning the true status of systems and proving that systems work is ultimately the purpose of testing. To this end, the Army Test and Evaluation Command (ATEC) conducts testing starting with developmental testing and culminating with operational testing, which places systems into the hands of soldiers in a realistic operational environment and gathers information to prove to leaders that the systems are operationally effective, suitable, and survivable.

The outcome of effective testing is scientifically rigorous information provided to senior leaders to support acquisition decision making. Since the Army no longer assigns enlisted soldiers to developmental test centers nor does it maintain units specifically for operational testing of new equipment, ATEC must compete with readiness requirements and increased operational commitments to obtain the operational resources required to support testing. The test support mission is large, but recent experience shows that most systems fail to come to test on time, which significantly challenges the Army mechanisms that synchronize and program operational resources to test support.

The Magnitude of the Mission

The impact of operational testing becomes clearer when one considers the scope of Army operational resources committed to testing. Figure 1 (p. 68) summarizes a portion of the tactical re-

sources allocated to tests conducted in fiscal 2001. It lists a tactical element of a given size and the number of test days for which that type of unit was documented as being planned for testing support. This does not reflect actual changes made to the use of, and schedules for units supporting the actual execution of the test. Such changes are frequent, often reducing the actual time the units spend in test support. Figure 1 also represents an approximation of the unit-level resources committed for all testing conducted in fiscal 2001 (for example, it does not reflect individual soldier requirements), but clearly, the Army commits a significant portion of tactical resources to test support.

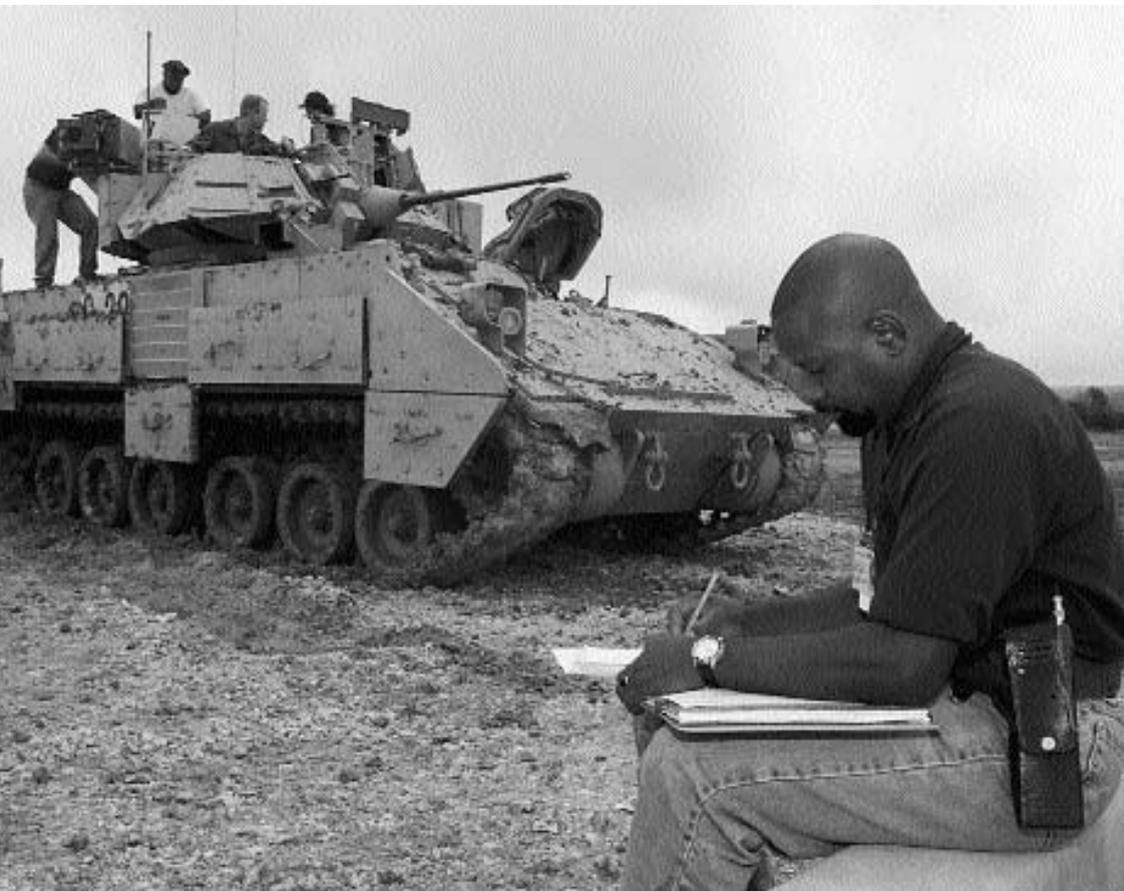
If approximately half of these tests experienced test slips and schedule delays, then the disruption to unit planning and training will have been passed on to a roughly equal proportion of the support commitment shown. Division Capstone



Soldier in tactical movement during the Light Thermal Weapons Sight Independent Operational Test at Schofield Barracks, November–December 2001. Photo by Tad Browning

Exercise data have been extracted in the second data column (Figure 1) to more accurately portray the assets committed to testing in support of acquisition milestones in fiscal 2001. Clearly, the Army

Seated in the foreground is a USAOTC data collector on the job, as technicians work with instrumentation atop an M2 Bradley during the Battlefield Combat Identification System Independent Operational Test (BCIS IOT) at Fort Hood in September 2001. Photo by Dennis McElveen



context of the considerable resources in soldiers, equipment, land, ranges, money, and other resources being requested for each of these operational tests, this is a very significant finding and cannot be ignored when reviewing the Army processes for synchronizing operational resources.

TSARC and the Five-Year Test Program

The Headquarters Department of the Army (HQDA) TSARC process established in Army Regulation (AR) 15-38 and incorporated in AR 73-1, January 2002, can efficiently resource operational testing while minimizing disruption of unit operational readiness and mission execution. HQDA, Office of the Deputy Chief of Staff, G-3, approves and ATEC publishes the Five-Year Test Program (FYTP), which tasks operational test support missions to units and agencies. The FYTP is the primary product of the TSARC. In AR 73-1, HQDA

establishes and defines the FYTP:

The Five-Year Test Program (FYTP) is a compendium of OPTs approved by HQDA DCSOPS for the Chief of Staff, Army (see chap 9). USATEC publishes and disseminates the FYTP. It includes all OTPs for tests scheduled for the next 5 years. The OTPs contained in the FYTP must be continuously updated in TSARC working group sessions as data become available. The OTPs for Ts [tests] that require user troops must be included in the FYTP. When the FYTP is approved, the OTPs for the first 2 years (current and budget) become Army-level taskers. The remaining 3 years of the FYTP are for out-year planning purposes. The FYTP is updated twice per year in conjunction with the GO [General Officer] TSARC.

Therefore, the process (shown on p. 69) leading to approval of OTPs for inclusion in the FYTP is of great importance

would benefit from improved predictability to unit schedules and reduced Operations Tempo by improving the accuracy of operational test schedules.

Majority of Operational Tests Slip Schedule

A recent analysis of Outline Test Plans (OTPs) for 308 operational test events encompassing TSARC (The Test Schedule and Review Committee) cycles from spring 1997 to fall 2001, and also covering executed and planned future tests from October 1997 to September 2007, amplifies the difficult task presented to the TSARC to resource Army operational testing.

Of the 308 events planned since spring 1997:

- OTPs for 73 of the events were withdrawn completely from consideration before test execution.

- Of the remaining 235 events, 111 are pending tests not yet completed, but 76 of these 111 tests or 68 percent have already had test date changes.

- A total of 124 events were executed.

Of the 124 completed test events:

- OTPs for 68 of the 124 or 55 percent of the events changed test dates.
- Only 56 tests were executed as originally scheduled.
- Nine of the events were conducted with slips of less than one month.
- A total of 59 of the events were executed after a slip of a month or more.

Overall, including future and completed tests, 61 percent of the tests slipped (Figure 2, p. 70). When considered in the

to the acquisition community, ATEC, and the operational force providers.

Systemic Challenges to Operational Test Resourcing

Three major systemic challenges are inherent to the TSARC process.

Systemic Challenge No. 1

The first major systemic challenge to the TSARC is disparate planning time frames for the resources at issue. The current TSARC process does not anticipate major operational test support requirements in detail much beyond 18 months from resource requirement date. Army agencies estimate future funding needs in a Program Objective Memorandum (POM) process that examines closely the current year of execution, the budget year, and four years beyond (the "POM" years).

The U.S. Army Forces Command (FORSCOM), at each semiannual Forces Command World-Wide Training Conference, reviews a Five-Year Training Calendar that resolves the activities of FORSCOM elements to battalion level for five years. Much of the calendar for these units is understandably committed to operational missions, including rotations into operational missions, exercises that certify the units as prepared for these missions, Combat Training Center (CTC) rotations, and other substantial training missions such as warfighter exercises.

The calendar also includes Joint exercises and other substantial events, including major operational test support requirements. The bottom line is that Army Agencies and Major Commands (MACOMs) have a pretty good estimate of funding and operational activities and requirements at least five years into the future.

The TSARC plans an FYTP, but only the current and budget year OTPs are considered for tasking. OTPs for tests in the "POM" years are for "planning purposes only," and experience shows that these rarely rise to the level of interest to be included in MACOM FYTPs. This contributes to a lack of detail available in OTPs for test events and associated op-

erational resource requirements three years or more into the future.

The outcome of this mismatch in planning horizons for funding, troop resources, and operational tests is that MACOM operational and training plans, such as FORSCOM's plan, are two to three years matured by the time most operational tests are closely reviewed by the TSARC membership for supportability.

Systemic Challenge No. 2

The second systemic challenge to the TSARC mission accomplishment is the review process by various agencies of test plans and supported system acquisition programs. The TSARC process assumes in most cases that the test events planned in the Test and Evaluation Mas-

ter Plan (TEMP) are appropriate. All tests receive strategic guidance for test and evaluation through reviews at either ATEC headquarters or the tester's and evaluator's headquarters.

Although the Director, Operational Test and Evaluation (DOT&E) no longer approves ATEC's system Test and Evaluation "campaign plan," the System Evaluation Plan (SEP), TEMPs, and Event Design Plans, or EDPs (operational test event plans), are submitted for approval to DOT&E for all major Army systems and other non-major systems designated for DOT&E oversight. This frequently leads to recommended test changes from the HQDA or OSD levels relatively late in test event planning, and well inside the 180-day tasking window directed by HQDA for tasking MACOMs.

FIGURE 1. Portion of FORSCOM Unit Days Committed by TSARC to Operational Test Support Missions in Fiscal 2001

Type of Element	Unit Days Incl DCX*	Unit Days not Incl DCX
Providing Operational Test Support		
Air Defense Artillery Battalion	144	0
AH-64 Troop/Company	213	0
Artillery Unit, Counter Battery Radar	50	50
Artillery Unit, Counter Mortar Radar	50	50
Maneuver Brigade	71	0
Maneuver Bde Tactical Operations Center	998	122
Chemical/Biological Platoon	498	498
Battalion/Battalion Task Force/ Mechanized Heavy Battalion Task Force	489	134
Cavalry Squadron Battle Staff	92	19
Cavalry Troop Planning Cell (Air)	38	38
Combat Aviation Battalion	71	0
Corps Main Command Post	73	0
Corps Signal Brigade	134	61
Division Aviation Brigade	71	0
Division Command Post/Division Tactical Operations Center	288	0
Division Artillery Tactical Operations Center	73	0
Explosive Ordnance Detachment Team	38	38
Field Artillery Battalion	142	0
Light Infantry Company	59	59
Medical/Medical-Evacuation Support Team	42	42
Military Intelligence Unit, Ground Surveillance Radar	162	162
Opposing Forces Track Vehicle Crew	842	842
Tactical Unmanned Aerial Vehicle Section/Platoon	31	31

*DCX = Division Capstone Exercise

PROCESS LEADING TO APPROVAL OF OUTLINE TEST PLANS FOR INCLUSION IN THE ARMY FIVE-YEAR TEST PROGRAM

To produce a viable Five-Year Test Program (FYTP), Headquarters Department of the Army (HQDA) specified the following tasks for the Test Schedule and Review Committee (TSARC):

- Review and recommend coordinated OTPs for inclusion in the FYTP. Ensure satisfaction of requirements to ensure timely notification of personnel or equipment support requirements.
- Review and recommend Test and Evaluation (T&E) priorities.
- Review and coordinate resources for OT&E, and for troop/resource support of Developmental Testing (DT) beyond ATEC's or the material developer's resources.
- Resolve conflicts between test requirements and other missions.
- Review testing schedules to minimize the test support impacts on providing units.
- Review funding for Operational Test and Evaluation (OT&E).
- Review and recommend approval of the FYTP and associated test priorities.

The tasks specified above are not trivial. The TSARC often faces tough issues concerning resources critical to both priority operational test and operational mission requirements. The TSARC membership provides the necessary input to the process to allow HQDA to review the competing requirements and recommendations from the acquisition community, the test community, and the operational resource providers to make the best decisions. The Commanding General, Army Test and Evaluation Command (CG, ATEC) chairs the TSARC and provides an executive secretary. The TSARC membership* is General Officer (GO) or equivalent representatives from the following organizations:

- Assistant Secretary of the Army (Acquisition, Logistics, and Technology)
- Assistant Secretary of the Army (Financial Management and Comptroller)
- HQDA, Office of the Deputy Chief of Staff, Operations and Plans
- HQDA, Officer of the Deputy Chief of Staff for Programs
- HQDA, Office of the Deputy of Information Systems for Command, Control, Communications, and Computers

- HQDA, Office of the Deputy Chief of Staff for Personnel
- HQDA, Office of the Deputy Chief of Staff for Logistics
- HQDA, Office of the Deputy Chief of Staff for Intelligence
- U.S. Army Forces Command
- U.S. Army Pacific
- U.S. Army Europe
- U.S. Army Special Operations Command
- U.S. Army Training and Doctrine Command
- U.S. Army National Guard
- Office of the Chief of Army Reserve

The TSARC is supported by a formal working group that meets four times a year. This working group is the critical body of action officers that sustains continuous staffing of resource requests and which resolves the vast majority of test resource issues. CG, ATEC, provides the TSARC working group chairperson, and each Army element represented on the TSARC appoints a working representative (colonel, lieutenant colonel, or equivalent DA civilian) and alternate. The TSARC working group meets in August and February to:

- review new OTPs for resource support; and
- review OTPs that have been revised since the previous FYTP.

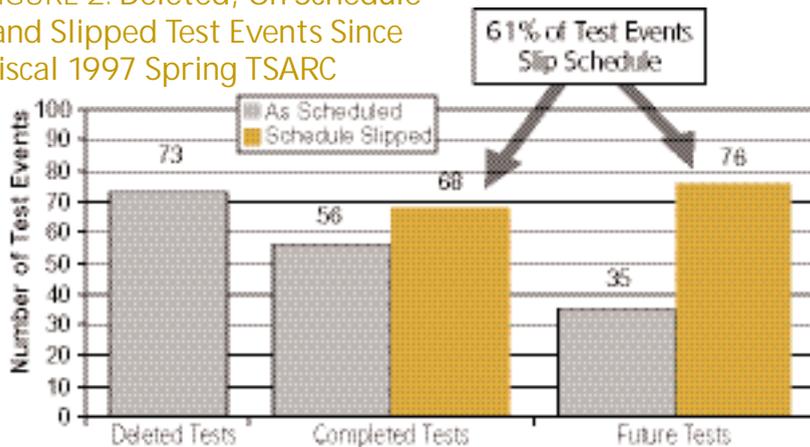
In October and April the TSARC working group conducts a "mid-cycle" meeting to:

- review the OTPs to ensure their adequacy;
- verify the test need and satisfaction of resource notification requirements;
- identify any issues requiring GO TSARC resolution; and
- review proposed test priorities.

In December and June the "GO" TSARC meets for resolution of remaining issues and to recommend those OTPs and associated test priorities for inclusion in the next HQDA FYTP.

* The chairperson may request other Army agencies and Army commands to attend when tests fall within their functional area of responsibility or involve their resources.

FIGURE 2. Deleted, On Schedule and Slipped Test Events Since Fiscal 1997 Spring TSARC



Systemic Challenge No. 3

The third systemic challenge to the TSARC is the very nature of acquisition programs that makes it difficult for planners to predict discrete test events requiring operational test (OT) resources in the “out” years to match the other resource estimation processes. The TSARC process must assume the program manager’s plan and schedule are realistic.

The Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA/ALT) is the TSARC member charged with providing a “reality check” on program manager readiness to proceed to a specific OT event. The next level of resolution available to the TSARC members is the input from the individual system PMs through the system test and evaluation (T&E) Integrated Product Teams (IPTs), which prepare the system TEMP. The TSARC must assume that the test schedule established in the TEMP is realistic, although TSARC members have noted cases where a system has been unable to meet projected test dates for several years.

As PMs assess their system readiness for operational test, they can increase the chances of preserving test resources by providing early notice that a system will not be ready. Documented experience is that slip notice is usually within a few months and sometimes even a few days prior to the scheduled test date. Changes on such a short notice significantly impact unit schedules. A slipped test for a system that is being delayed but not cancelled usually generates a new request

for the operational test resources at a later date.

Some of the most challenging situations for the TSARC are when test delays are announced at or beyond Operational Test Readiness Review (OTRR) 2 (test date minus 60 days) and the test slip is of a “short” duration (less than 180 days). This situation may require extensive and rapid effort to reschedule and resynchronize extensive test resources, including soldiers, equipment, land, ranges, simulation facilities, airspace, instrumentation, and contracted test support.

The bottom line is that any slip may force the resubmission of the OTP out of the normal TSARC cycle, due to the Chief of Staff of the Army 180-day MACOM tasking window policy for the potential loss of test resources.

A Road Ahead

A road ahead is to improve Army forecasting of operational test resource needs, to reduce the TSARC resource prioritization conflicts, and to reduce the impact on units of operational test slips. There are several potential solutions.

- First, the TSARC process could use analysis of historical T&E resource requirements to “POM” T&E operational resources on a time scale to match other Army planning windows. If 10 years of data indicate that FORSCOM has been asked to provide an average of 300 chemical platoon days per fiscal year of support to test new chemical/biological systems, then

the TSARC should communicate a “warning order” to allow the appropriate MACOMs to project that need into the “out years”—realistically two to four years from resource date.

- Second, program managers should provide the TSARC and the operational testers the earliest possible warning that a scheduled operational test event may slip due to system readiness. This will serve to decrease the impact of test slips and cancellations on units, thereby increasing unit predictability and improving the chances that force providers will be able to accommodate a test slip.

Program managers must realize that in the current operational OPTEMPO environment, test slips will usually trigger at least a 6- to 12-month delay to request soldiers for the new test resource date. This reality should also be considered when planning program baselines and the time allowed for transition from developmental testing (test-fix-test with significant flexibility in the event schedule) to operational testing, requiring less flexible operational resources.

- Finally, the TSARC may consider assigning major force providers such as FORSCOM, U.S. Army Europe, or U.S. Army Pacific to test “windows” two to four years out, with a certain level of anticipated support—for example, a brigade with headquarters and associated slice elements—to accommodate testing of systems and “system of systems.” The TSARC would then adjust the actual test design and requirements working with the T&E IPT(s) for the systems requiring support as the detailed requirements resolve.

These measures will improve the TSARC’s ability to resource operational tests that continue to prove with scientific rigor that our Army systems work.

Editor’s Note: The authors welcome questions or comments on this article. Contact Laky at LakyPeter@otc.army.mil. Contact Riley at RileyPhillip@otc.army.mil.

Aldridge Publishes Policy Guidance on Acquisition of Services

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

31 MAY 2002



ACQUISITION,
TECHNOLOGY AND
LOGISTICS

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
DIRECTOR, DEFENSE RESEARCH AND DEVELOPMENT
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
DIRECTOR, OPERATIONAL TEST AND EVALUATION
COMMANDERS OF THE COMBATANT COMMANDS
ASSISTANT SECRETARIES OF DEFENSE
DIRECTORS, DEFENSE AGENCIES
DIRECTORS, DOD FIELD ACTIVITIES



SUBJECT: Acquisition of Services

Sections 801 through 803 of the National Defense Authorization Act for Fiscal Year 2002, Pub. L. 107-107, establish a series of requirements impacting the acquisition of services in the Department of Defense. My office is in the process of implementing those various requirements. The attached policy guidance establishes a review structure and process for the acquisition of services in accordance with section 801(d). Other implementation actions will be issued separately.

Through this guidance and other forthcoming guidance, it is my intent to move DoD to a more strategic and integrated approach to the acquisition of services that recognizes the importance of service acquisitions to the Department and the need to treat the acquisition of services as seriously as we do the acquisition of hardware.

Within 60 days of the date of this memorandum, each of the Military Components will propose a Services Contracts Oversight Process (SCOP) — a process and procedures for their management and oversight of acquisition of all acquisitions of services. This process will be reviewed by an OSD team, led by the Director of Acquisition Resources and Analysis, who will provide a recommendation to me, and upon approval I will delegate oversight responsibility to the Component.

My point of contact for this action is Mr. Richard K. Sylvester, Office of the Director, Acquisition Initiatives. Mr. Sylvester may be reached by phone at 703-697-6399 or by e-mail at richard.sylvester@osd.mil.

E.C. Aldridge, Jr.

Attachment
As stated



Editor's Note: This information is in the public domain. To download the attachment to Aldridge's memorandum, go to the Director, Acquisition Initiatives Web site at <http://www.acq.osd.mil/ar/ar.htm#newservicepolicy>.

Use It or Lose It

Optimizing “Cash On Hand” in a Defense Working Capital Fund Organization

MARK LEWIS

As clearly illustrated in David Breslin’s “Opportunities for Working Capital Fund Organizations and Their Customers,” published in the May-June 2002 issue of *Program Manager*, organizations financed by the Working Capital Fund (WCF) often have trouble deciding *when* to spend their discretionary money. Their typical dilemma: should we invest in that equipment, that facility, or those computers *now*—or should we wait six months?

Everybody’s Right

Conservatives will want to wait until the end of the fiscal year to make sure the expected revenues arrive. Contracting officers may feel more comfortable awarding contracts in the first or second quarters of each fiscal year. Aggressive money managers will want to spend it all on Oct. 1. Each opinion has merit, but the management style of the organization’s leaders will determine the timing. Because conservatives abound throughout DoD, this article explores the poorly understood *aggressive approach*. Hopefully some of you will convert.

Show Me the Money

Cash is the most liquid form of assets. In most settings, people understand “Cash on Hand” to be the balance of the organization’s cash account—highly liquid assets directly controlled by the organization to facilitate day-to-day oper-



Lewis is currently an engineer participating in the Commander's Development Program at Naval Sea Systems Command (NAVSEA), Washington Navy Yard. He holds a master's degree in Business Administration and graduated from Harvard Business School's "Program for Management Development." He is also a graduate of the Advanced Program Management Course (APMC 01-2), Defense Systems Management College. Contributing his statistical analysis expertise to the article was George Lopez, Naval Sea Systems Command, Fallbrook, Calif.

ations. Working Capital Fund organizations don't have stacks of \$100 bills stashed in wall safes, but on the books they still have cash accounts, with cash being generated each day from overhead. While cash is necessary in almost all business environments, the cash balance (or stated differently "the cash on hand") is to be minimized since cash is a "non-earning" asset. Its rate of return to the organization is zero at best, while

high rates of inflation can significantly reduce its value. To best use your cash, convert it as quickly as possible into revenue-generating facilities, equipment, or other forms of less liquid assets.

More Aggressive Cash Management = More Efficient Cash Management

Optimizing the amount of cash on hand is simply a cash flow exercise: forecast expected monthly cash receipts and then subtract expected monthly cash payouts. If this value (i.e., the balance of the cash account) is expected to remain positive throughout the year, convert the excess cash into working assets. In the private sector the theoretical goal is to keep the cash balance as close to zero as possible, while staying positive to avoid expensive short-term external financing. Most organizations should hold only the minimum amount of cash needed in the short term.

In practice, management sets the minimum cash balance at a level below which they do not wish to fall. This "safety stock" reduces the organization's risk should unexpected opportunities or problems arise. Under conditions of relative certainty (like in the DoD), managers reduce the level of "safety stock"

to make more cash available for operations or investments. During periods of increased uncertainty, we increase "safety stocks" to deal with contingencies.

More aggressive cash management (i.e., dramatically more spending early in the fiscal year) equates to more efficient cash management.

Crunch, Crunch, Crunch..

Figure 1 might represent the cumulative monthly revenue (inflation adjusted) for a typical WCF organization over six years. These data show a predictable revenue pattern, especially considering the uncertainty associated with Continuing Resolution Authority.

Let's say the Command policy is to generate cash at 3.5 percent the rate of revenue. Therefore, monthly cash generation (i.e., "cash receipts") can be determined. Figure 2 on the next page, again, shows a predictable trend where statistical regression provides the best-fit curve:

$$Y = 5383.4X + 230.3X^2; \text{ where } y \text{ is thousands of dollars, and } x \text{ is month (i.e., 1 to 12); the coefficient of determination is 0.996.}$$

Cash is a non-earning asset. Minimize "cash on hand" and to the extent possible, spend the cash account sharply into the red at the start of each fiscal year. Limit spending in the second and third quarters to get back into the black by the end of the third quarter. Then spend accordingly in the fourth quarter to manage the cash balance down to zero.

FIGURE 1. Cumulative Inflation—Adjusted Fiscal Year Revenue (Month Ending)

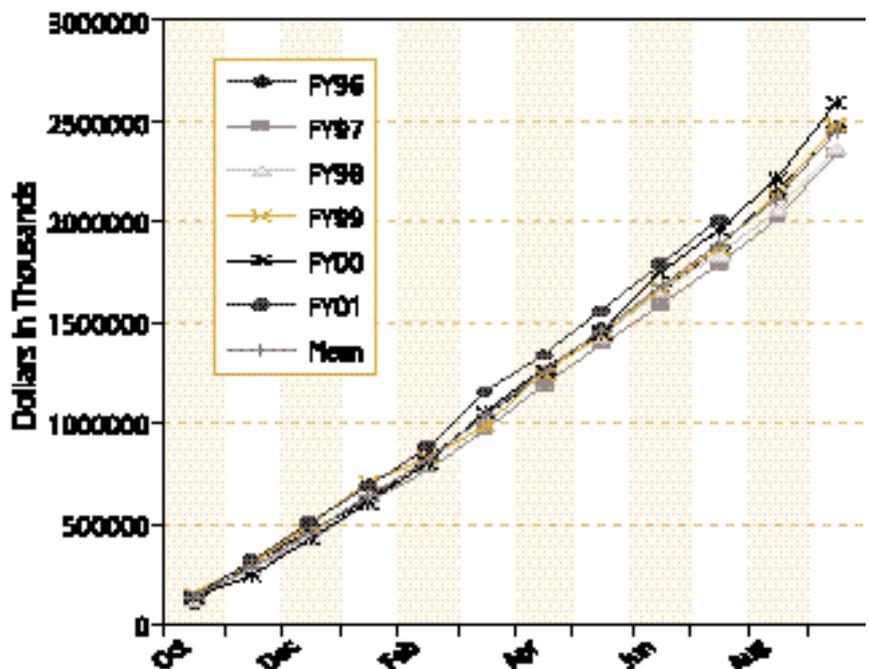
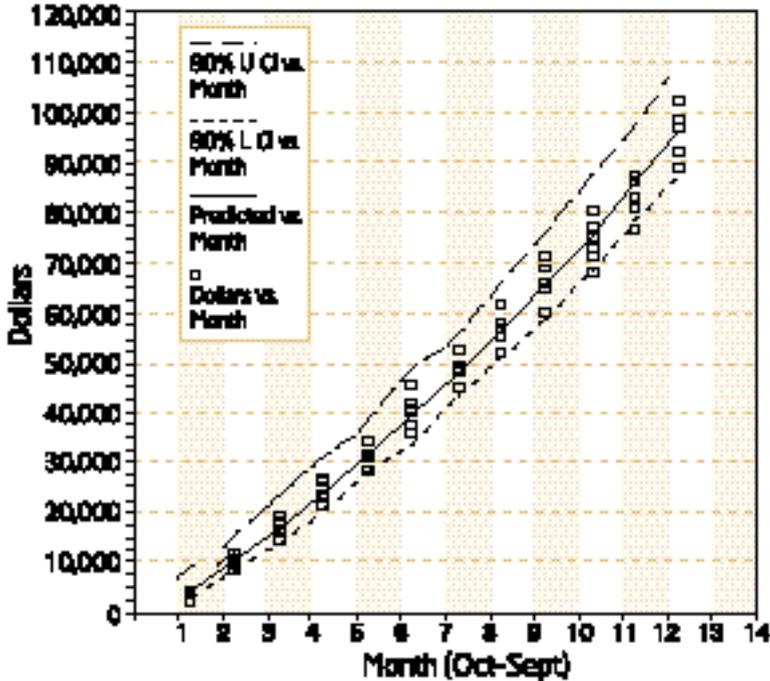


FIGURE 2. 90 Percent Confidence Interval for Cumulative "Cash Receipts" (In Thousands of Dollars)



The 90 percent Upper and Lower Confidence Intervals (UCI and LCI) are shown in Figure 2. Predicting future "cash receipts" solely from historical data is statistically improper, but you can gain valuable insight about your organization's financial trends through this approach. For example, we are 90 percent sure that at least \$86 million in cash will be generated each fiscal year, all other factors being equal. Figure 3 shows the same data, but with 95 percent confidence intervals. We are 95 percent sure at least \$84 million in cash will be generated.

Free Money

Private firms hold cash for four reasons: 1) to take advantage of discounts when purchases are made with cash; 2) to maintain a credit rating (lenders prefer to see high liquidity); 3) to take advantage of unexpected business opportunities; and 4) to address emergencies.

Only the last two points are relevant for use throughout DoD, and it can be argued that government bureaucracy delays action on most opportunities into future fiscal years (precluding the need to stockpile cash to address the opportunities). Obviously your WCF organization can hold relatively less cash than private firms can.

Let's say that the analysis of your past "cash receipts" and "cash expenditures" shows that your Command's cash balance (i.e., receipts less expenditures) has historically stayed in the black throughout the fiscal year (Figure 4, p. 75). If your Comptroller was aware of the situation, you might have even been criticized for your inefficient use of funds.

The key to efficient cash management is the Working Capital Fund, which effectively provides you *free loans throughout the fiscal year*. This is in contrast to the situation faced by private companies that must pay substantial interest rates on short-term loans and lines of credit if their cash balance is inadequate at any time throughout the year. As explained earlier, private firms want to maintain as close to a zero cash balance as possible without falling below zero. If the WCF is your lender, however, a penalty is incurred if your cash balance is negative at the end of the fiscal year, but it is technically acceptable to operate "in the red" for the prior 364 days. Lacking any financial penalty for keeping a negative cash balance, a WCF organization can optimize its cash by spending as quickly as possible in the first quarter of each fiscal year and then recovering back to a zero balance by the fiscal year end.

If your Command expects to generate, say, \$100 million in discretionary cash throughout the fiscal year, then theoretically you should spend \$100 million in the first quarter. Throughout the year, overhead will generate the \$100 million in "cash receipts" to cover the cash outlay. In this example, the average cash balance for the year would be on the

FIGURE 3. 95 Percent Confidence Interval for Cumulative "Cash Receipts" (In Thousands of Dollars)

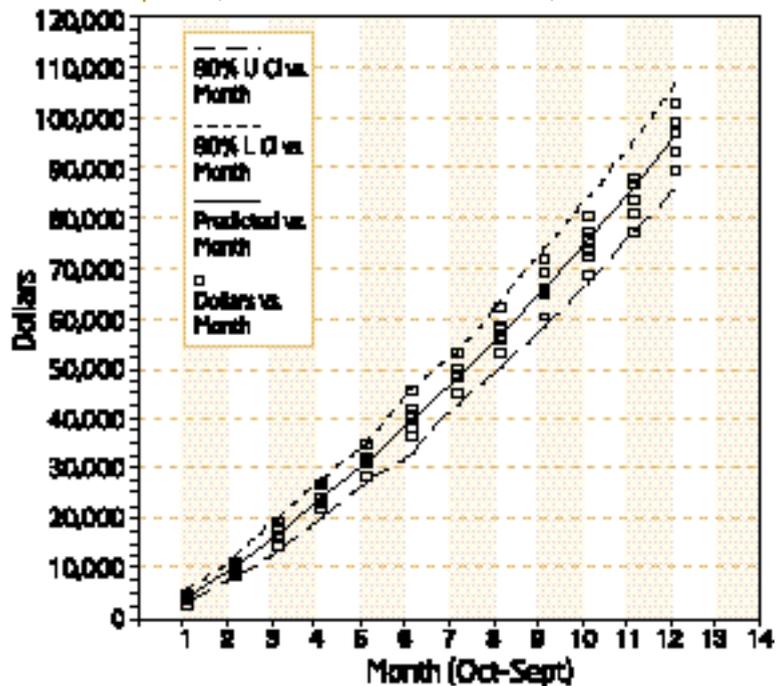
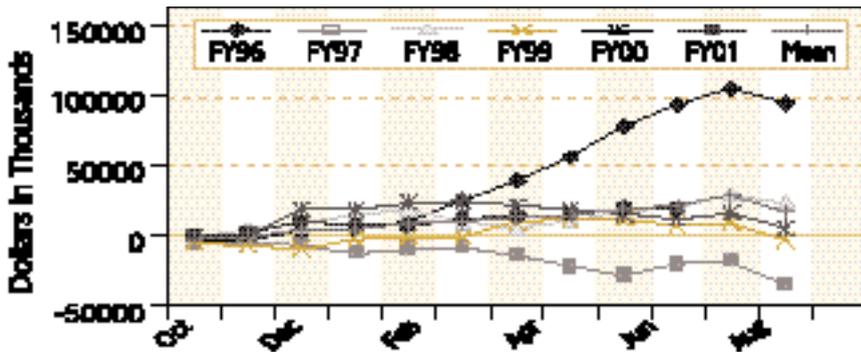


FIGURE 4. Historical Cash Balance



order of -\$50 million. Extending this negative cash balance over several years illustrates that you would make significantly more funds available for investments, and perhaps more importantly you would effectively be taking out a zero-interest \$50 million loan from the Working Capital Fund that need never be paid back.

Of course, this aggressive approach requires excellent forecasts of inflation-adjusted revenue to ensure a zero or positive cash balance by the end of the year. If revenues fall short of forecasts, the fiscal year will end with a negative cash balance. Many organizations will not feel comfortable with this optimized approach.

A more moderate philosophy is to spend cash at a somewhat reduced rate in the first quarter (although at a much higher rate than cash is being generated), then stop spending in the second and third quarters to build up a positive cash balance. Spend the remaining cash in the final quarter (Figure 5). This risk-managing approach gives you more control over the year-end financial position, yet still makes better use of cash than does the current practice.

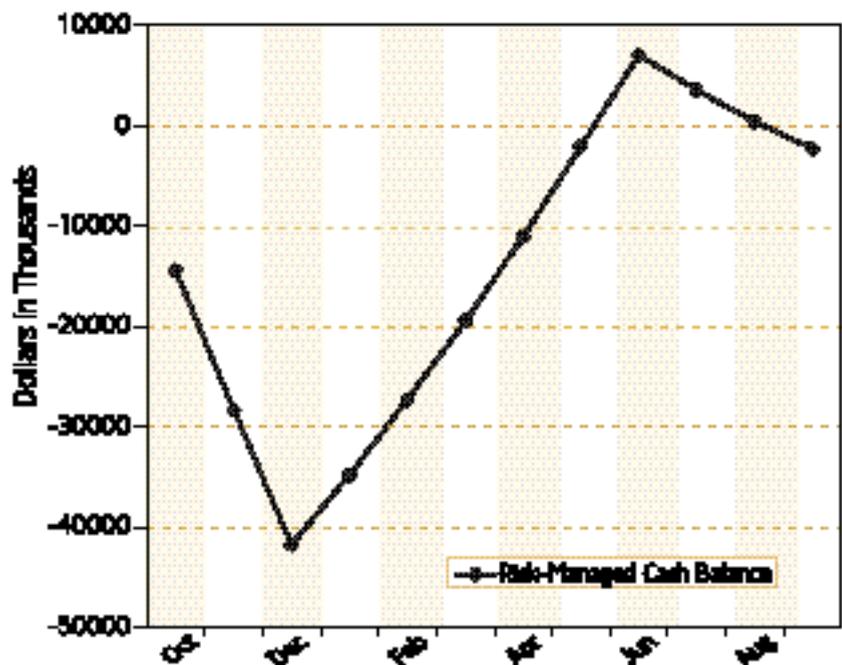
For example, if the cash budget is \$100 million for the year then you could spend \$60 million in the first quarter. Zero cash outlays in the next two quarters would result in a slightly positive cash balance at the end of the third quarter (around \$7 million), and the budget for the fourth quarter would be \$40 million. If we assume that future inflation-adjusted revenue will mirror historical revenue, we can plan outlays to be 95 percent sure (or 90 percent sure, or 99 percent sure, or whatever level at

which your Command feels comfortable) that we will have a positive cash balance at the end of the third quarter.

In this example, the average cash balance throughout the year is -\$10 million to -\$20 million. Again, extending this negative cash balance over several years equates to a zero-interest \$10 million loan that your Command does not have to pay back. Conversely, carrying a positive cash balance throughout the year equates to perpetually loaning out millions of dollars—which the WCF does not have to pay back to you.

In a strict financial sense, there are few arguments against adopting the cash-spending policy depicted in Figure 5. Contracting or finance offices, however, might not be able to process the increased workload in the first quarter.

FIGURE 5. Risk-Managed Use of Cash



More aggressive financial policies are more risky, so some risk-averse people will have difficulty accepting the change. Others will resist simply because they do not like change itself. Recognize that many accountants, due to their conservative training, would be less accepting of the new approach than would economists.

Just Do It!

Cash is a non-earning asset. Minimize “cash on hand” and to the extent possible, spend the cash account sharply into the red at the start of each fiscal year. Limit spending in the second and third quarters to get back into the black by the end of the third quarter. Then spend accordingly in the fourth quarter to manage the cash balance down to zero. This more aggressive cash-management philosophy makes more funds available for investment, effectively gives your Command an interest-free loan that you need never pay off, and realizes revenue faster since you will turn cash into revenue-generating assets sooner. Even you risk-averse managers can use this technique by using conservative confidence intervals during your analysis.

Editor’s Note: Lewis welcomes questions or comments on this article. Contact him at Lewismr@navsea.navy.mil.

Leading Project Teams

Program Management is Rapidly Becoming Team Management

OWEN GADEKEN

In today's acquisition environment, program management is rapidly becoming team management. The old hierarchical program office is being replaced by a set of integrated product teams (IPTs). The result is a program structure which is best characterized as a "team of teams."

This article examines changing team dynamics and why DAU is placing increased emphasis on leading project teams. It also looks at how traditional program/project offices are becoming team-based organizations that need and expect team building and leadership skills from those who would lead.

Project Management is Dependent on Team Success

The traditional organizational structure or top-down "wiring diagram" is being replaced with interlocking networks of cross-functional teams. An example is the Marine Corps Advanced Amphibious Assault Vehicle (AAAV) program organization (Figure 1, p. 78).

In many ways, this organizational evolution is the result of the acquisition reforms begun by former Secretary of Defense William Perry early in the Clinton administration. In his May 10, 1995, memorandum on "Use of IPTs in DoD Acquisition," Dr. Perry called for the "performance of as many acquisition functions as practicable using integrated product teams." We in defense acquisition often assume that IPTs were "invented" by DoD, but there is sufficient evidence to conclude that IPTs are an-

other example of DoD adopting commercial best practices.

The ultimate success of the new team-based organization hinges upon the success of its fundamental building blocks—the teams themselves. Thus, program success is entirely dependent upon success of the individual teams that are part of the network. To achieve repeatable and predictable success, we must study the research and literature on successful teams.

Most Teams Remain Dysfunctional

While teams and team building are very popular topics in management litera-

ture today, most of this literature is anecdotal and not based on empirical research. Perhaps the best early research on team dynamics was done by British physician Wilfred Bion. In his classic *Experiences in Groups*, Bion discovered that there are powerful psychological forces inherent in all groups that divert them from accomplishing their primary tasks. Examples of these forces are over-dependency on the leader, splintering off into subgroups or cliques, and fight or flight (engaging in or fleeing from intra-group conflict).

Upon closer examination of the classic stages of team development (forming, storming, norming, and performing),



Gadeken is a Professor of Engineering Management, Program Management and Leadership Department, Defense Systems Management College-School of Program Managers, Defense Acquisition University, Fort Belvoir, Va.

MY FIRST SUCCESSFUL TEAM EXPERIENCE OR... HOW TO TAKE THE LOW ROAD TO A HIGH PERFORMANCE TEAM

Forming

As a young lieutenant, I was sent to Squadron Officer School at Maxwell Air Force Base in Montgomery, Ala. This was the first in the series of Air Force professional military education courses I was required to complete during my career. We were immediately formed into teams of 12 officers. Much of the course featured competition between these teams.

Storming

As the most junior member of my team, I quickly observed the tremendous pressure to show individual leadership capability. At one point early in the course, almost everyone in our group was vying to become the team leader. This conflict was so intense that it caused us to fail miserably in our first outdoor team building exercise. We spent so much time fighting over leadership that we were unable to complete any of the events on the outdoor obstacle course. What followed was a very intense period of bickering, conflict, and even shouting matches as our dysfunctional team tried to cope with our early failures and find some way to succeed.

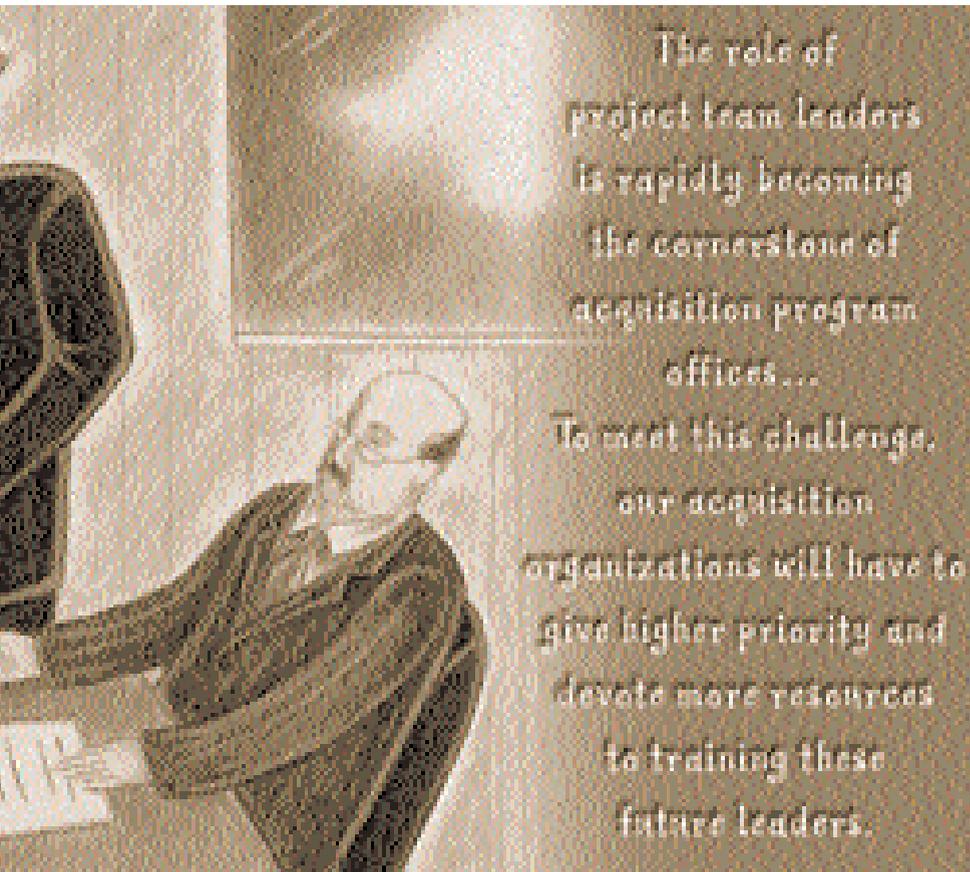
Norming

Slowly some real leadership emerged from the more senior members who were also experienced pilots, and an informal sense of teamwork and organization took shape. When we began to have some success in team competitions, the momentum grew.

High Performing

As evidence of our total turnaround, we successfully completed all events on our second try at the outdoor obstacles near the end of our course. Our team even won the chief of staff trophy as the best overall (academic and athletic) team in the course. The most surprising part of this turnaround was that it emerged from almost complete frustration as we slowly and even painfully worked through our conflict to develop a sense of teamwork.

As an aside, most of the other student teams in our course also performed poorly on their initial team activities but did not improve as significantly as the course went on.



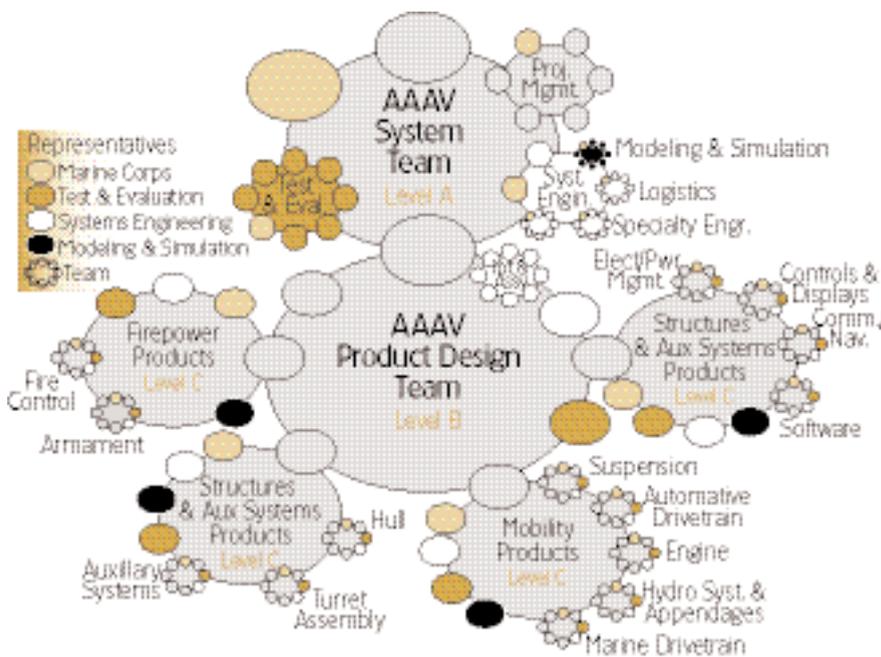
Bion is really saying that teams usually get hung up in the *storming* and *norming* stages and never make it to the *high performing* stage. This is clearly illustrated in Figure 2 on p. 79 where the team development stages are overlaid on the team performance curve taken from *The Wisdom of Teams* by authors Jon R. Katzenbach and Nicholas K. Smith. Beyond the *forming* stage, team performance actually deteriorates during *storming* and *norming*, making it even more difficult for teams to progress to *high performing*.

So the reality is that *high performing* is the exception rather than the rule for most teams. (As an example of a team that actually made it to *high performing*, the sidebar above describes my first successful team experience.)

Teams Require Activation Energy

So what does it take for teams to progress to *high performing*? I use the term "activation energy" to describe the force required to move a team out of the

FIGURE 1. AAV IPT Structure



storming and norming “slump” and up the curve to reach *high performing*. Practically speaking, this energy is normally provided by the team leader. It also represents the energy required to counteract the natural negative forces or dysfunctional team behaviors described by Bion. In one sense, activation energy is a measure of the team leader’s skill in bringing a group to *high performing*.

In my Squadron Officer School example on the preceding page, as we confronted our conflicts openly our team actually got much worse before we got better. But this proves to be a hallmark of *high performing* teams: openly confronting conflicts rather than smoothing them over or concealing them as hidden agendas. Teams unwilling or unable to devote the energy to working through their conflicts will remain in a *storming* and *norming* “slump,” with most of their energy dissipated in nonproductive activity.

Team Leadership Requires New Skills

The natural assumption is that the most experienced project managers in an organization are the best candidates to become team leaders. However, existing project managers may not have the necessary skills to succeed as team leaders.

In *The Wisdom of Teams*, Katzenbach and Smith list six key team leader skills:

- Keep the purpose, goals, and approach relevant and meaningful.
- Build commitment and confidence.
- Strengthen the mix and level of skills.
- Manage relationships with outsiders, including removing obstacles.
- Create opportunities for others.
- Do real work.

In a series of competency studies completed by DAU over the last 10 years, top performing project managers were found to use a less directive style with more influencing and relationship behaviors than less successful project managers in the same organizations.

Just as most silent screen stars faded when talking pictures came into vogue,

DAU INTRODUCES “LEADING PROJECT TEAMS” COURSE NEW COURSE CAN BE TAILORED TO MEET THE NEEDS OF THE SPONSORING ORGANIZATION

The Defense Acquisition University Program Management and Leadership department is introducing a new short course specifically designed to meet the needs of DoD’s current and future project team leaders. The new offering—“Leading Project Teams”—is a one-week course that fulfills three key learning objectives. Participants will:

- learn and apply team building processes to develop and maintain effective teams;
- learn the roles of the project team leader and the skills needed to successfully perform these roles; and
- evaluate individual leadership and team building strengths and development needs using a variety of feedback instruments.

Topics for the course include team building, problem solving and decision making, conflict resolution, setting team goals, empowerment and coaching, and leading in an environment of change. Course content,

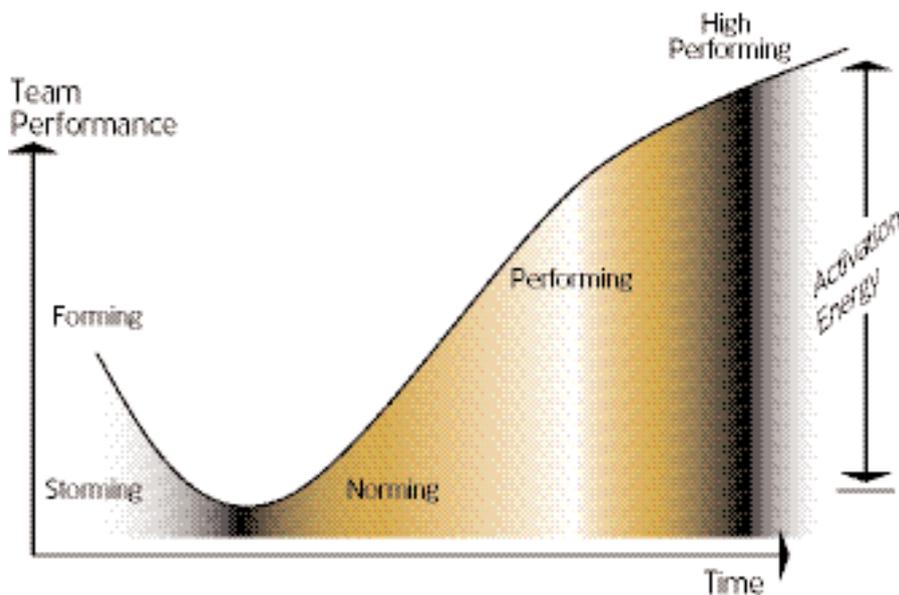
length, and location can be tailored to meet the needs of the sponsoring organization.

We also have a variety of special tools that facilitate team development. These range from “hands on” outdoor team building exercises to interactive management simulations that feature detailed observation and feedback on individual and team performance issues.

Even though team building principles and exercises are already incorporated into our Program Management career track, DAU is also committed to increasing the performance support provided directly to acquisition programs and teams in the field.

For more information, contact the DAU Program Management and Leadership Department at (703) 805-3424 or e-mail owen.gadeken@dau.mil.

FIGURE 2. Project Team Performance Curve



so too may the current generation of highly directive “hands on” project managers be replaced by a generation of coaching and facilitating leaders of more “self-directed” teams. The key question is whether our organizations will recognize these new competency requirements and then recruit or develop the cadre of skilled team leaders needed to ensure the success of ongoing projects.

Do You Have What It Takes?

An important part of career development for aspiring team leaders is to assess their skills for both their current as well as future jobs. While the military and civilian performance appraisal processes are intended to do this, rating inflation and organizational politics often make these appraisals far less useful. More effective is the “360-degree feedback” process, which has rapidly grown in use by both government agencies and commercial firms. Several commercially developed multi-rater instruments are now available that feature Web-based assessment followed by generation of tailored reports and development plans provided directly to the individual.

This comprehensive feedback can be invaluable in providing a candid assessment of a manager’s key strengths and development needs. However, it must be accompanied by more detailed as-

essment and action planning by the manager to interpret the detailed and sometimes inconsistent data and apply it to the manager’s current job. Here, it is often helpful to work with a coach or mentor who can provide additional support and feedback as managers attempt to make sense of their detailed feedback and develop specific actions they can use on their jobs.

Another useful set of tools are simulations and experiential exercises, which put participants in realistic situations that require use of specific management and leadership skills. Participants respond, not by stating what they would do in these situations, but by actually doing it; they then step aside and become students of their own behavior through follow-up discussions, including feedback from trainers and other participants.

These exercises are an ideal follow-on to the 360-degree feedback process and can offer participants much more specific feedback on the key behaviors identified in their feedback report.

No assessment process is complete without discussion of the value of ongoing feedback from the workplace. Every aspiring team leader should develop the skills of reflective and critical thinking. After all major team meetings

and events, the leader should candidly reflect on what worked well and what could be improved. This can be correlated with candid feedback from others who were involved, especially those who will speak freely without “sugar coating” the result. Honest self-assessment is an extremely valuable tool for every aspiring project team leader.

Future Direction

The role of project team leaders is rapidly becoming the cornerstone of acquisition program offices. But capable project team leaders are in scarce supply and developing them is an even greater challenge. To meet this challenge, our acquisition organizations will have to give higher priority and devote more resources to training these future leaders.

DAU intends to be part of the solution. As mentioned at the beginning of this article, we are already focusing on resources to provide training—such as our “Leading Project Teams” Course—and development tools that can be tailored and exported to meet this need. Our staff and faculty are committed to increasing the performance support provided directly to acquisition programs and teams in the field.

Editor’s Note: Gadeken welcomes questions or comments on this article. Contact him at owen.gadeken@dau.mil.

DoD 5000 SERIES UPDATE
 READ THE LATEST AT
[HTTP://WWW.ACQ.OSD.MIL/AR/](http://www.acq.osd.mil/AR/)

DoD 5000.2-R Final Regulation

Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs, signed April 5, 2002.

DoDI 5000.2, Change One Operation of the Defense Acquisition System, April 5, 2002.

DEFENSE ACQUISITION UNIVERSITY AND NATIONAL IMAGERY AND MAPPING AGENCY FORM STRATEGIC PARTNERSHIP

In an effort to extend its educational strategic partnerships and leverage learning opportunities, the Defense Acquisition University (DAU) signed a Memorandum of Understanding (MOU) with National Imagery and Mapping Agency (NIMA) during a ceremony held at DAU Headquarters, Fort Belvoir, Va., on June 17. Signatories of the MOU were Frank Anderson Jr., President, DAU, and John Green Jr., Deputy Director, NIMA Training Directorate.

The signing of the MOU is a foundation for DAU and NIMA to pursue educational opportunities and share selected research and strategic partnership information that is mutually beneficial to both parties. The opportunities identified in the memorandum include but are not limited to the following:

- Promoting the sharing of other training resources, including attendance at NIMA courses by DAU personnel.

- Offering seats in DAU courses for NIMA personnel.
- Sharing research information.
- Sharing strategic partnership information on colleges and universities that are willing to partner and allow government educational institutions, such as NIMA and DAU, to leverage course work toward degree and certificate requirements.

This strategic partnership provides an important new partnering opportunity to meet common acquisition education goals and increase the skills, knowledge, and abilities of the DoD Acquisition, Technology and Logistics workforce.

For more information about this partnership, contact Wayne Glass, Director for Strategic Partnerships, Strategic Planning Action Group, at Wayne.Glass@dau.mil, or call 703-805-4480.



John Green Jr., Deputy Director, Training Directorate, National Imagery and Mapping Agency, and DAU President Frank J. Anderson Jr., sign a Memorandum of Understanding on June 17, 2002, formalizing their partnership to pursue educational opportunities and share training resources as well as research information.

DAU AND LEAN AEROSPACE INITIATIVE (LAI) AT MIT SIGN MEMORANDUM OF UNDERSTANDING

On May 22, the Defense Acquisition University (DAU) added still another educational institution to the growing ranks of its educational strategic partnerships. In a ceremony held at DAU Headquarters, Fort Belvoir, Va., DAU President Frank Anderson Jr., and Deborah Nightingale, Professor and Lean Enterprise Model (LEM) Product Team Lead, Massachusetts Institute of Technology (MIT), and Co-Director, Lean Aerospace Initiative (LAI) at MIT, signed a Memorandum of Understanding (MOU) between DAU and LAI at MIT.

The purpose of this MOU is to jointly identify and pursue acquisition research and curriculum development opportunities. The general opportunities identified for this partnership include but are not limited to the following:

Acquisition Research Opportunities

- Collaborative development of research topics for DAU Research Fellows that address research of interest to the government acquisition workforce and the LAI at MIT, with a particular focus on materials that will support the acquisition workforce.
- Mutual assistance in designing and carrying out an appropriate research method, including any necessary site arrangements outside of MIT or DAU.
- Presentation by DAU Annual Research Fellows of their research results at a research seminar held at LAI at MIT in Cambridge, Mass.
- Joint development of the research project output report.

Curriculum Development Opportunities

- LAI at MIT may be a subject matter expert member of the Integrated Product Team (IPT) to develop the Basic Lean Introductory Module content, suitable for self-paced distance learning by a variety of audiences (government, private sector, and academia). It would be a resource available to be used as supplemental course material at both DAU and MIT as well as for professional development and continuous learning purposes. The IPT development effort would be led by DAU in cooperation with the Office of the Director, Acquisition Initiatives, Office of the Secretary of Defense.
- LAI at MIT and DAU will work collaboratively on incorporating LAI at MIT Lean Enterprise perspec-

tives into the DAU Program Manager's Course—PMT 401.

Other Opportunities

- Promote the mutual sharing of other training resources, including attendance by DAU at LAI at MIT courses by DAU personnel.
- Participation in DAU courses by LAI at MIT faculty, staff, and research assistants.
- Offering by LAI at MIT, in accordance with MIT's policies, of a visiting scholar appointment at MIT to a member of the DAU faculty for the purpose of a joint research or curriculum development project.
- Participation by DAU on the development team for a Lean Enterprise Self Assessment Tool that would address the lean customer acquisition and contract management processes involving government and industry.

For more information on this partnership, contact William T. Motley, Program Director of the DAU Production and Quality Management, Engineering and Technology Division, at Bill.Motley@dau.mil, or call 703-805-3763.



Deborah Nightingale, Professor and Lean Enterprise Model (LEM) Product Team Lead, MIT, and Co-Director, LAI at MIT; and DAU President Frank Anderson Jr., sign a Memorandum of Understanding on May 22, 2002, at Fort Belvoir, Va. The signing marks yet another strategic partnership for the Defense Acquisition University.

AcqDemo— A Contribution-Based Pay System

“Where Some of Us Are Now—And
Where the Rest of Us Are Heading”

MARCIA RICHARD

For the past few years, I like many others have been hearing the term pay-banding, referred to as a possible “new” pay system for Federal employees. The closest thing that I personally ever heard as a definition for this new system was, “It’s an industry-like pay structure for government employees.” That statement alone piqued my curiosity.

Because of my desire to learn and fully understand new and different initiatives that are being implemented within the acquisition community—for the Department of Defense specifically, and government-wide on a broader scale—I began researching the concept of pay-banding. I quickly learned that pay-banding, in fact, was only one facet of a contribution-based pay system. Since I always enjoy, as well as see a tremendous value in information sharing, this article is an attempt to share my insights on the DoD Civilian Acquisition Workforce Personnel Demonstration Project, commonly referred to as AcqDemo.

By Law

To set the stage, AcqDemo had its origins in a little heralded announcement published in the *Federal Register*, dated Jan. 8, 1999.

“Title VI of the Civil Service Reform Act, 5 U.S.C. 4703 authorizes the Office of Personnel Management (OPM) to conduct demonstration projects that ex-



“If anything has slowed us down, it’s probably lack of training. We need more training, on a recurring basis—once is definitely not enough.”

—Claude M. Bolton Jr.
Assistant Secretary
of the Army (Acquisition, Logistics and Technology)

periment with new and different personnel management concepts to determine whether such changes in personnel policy or procedures would result in improved Federal personnel management.”

Section 4308 of the National Defense Authorization Act for Fiscal Year 1996 (Pub. L. 104-106; 10 U.S.C.A. §1701 note), as amended by section 845 of the National Defense Authorization Act for Fiscal Year 1998 (Pub. L. 105-85), spells out the purpose of AcqDemo:

“...The Civilian Acquisition Workforce Personnel Demonstration Project is designed to provide an encouraging environment that promotes the growth of all employees and to improve the local acquisition managers’ ability and authority to manage the acquisition workforce effectively. This demonstration involves streamlined hiring processes, broad-banding, simplified job classification, a contribution-based compensation and appraisal system, revised reduction-in-force procedures, expanded training opportunities, and sabbaticals.”

AcqDemo PM

Anthony D. Echols currently serves as the Program Manager for AcqDemo. Echols is responsible for the planning and execution of this multi-million dollar project whose primary goal is to increase the quality of the acquisition workforce and the products it acquires.

Richard is a Program Analyst with the Office of the Secretary of Defense, Acquisition Education, Training, and Career Development (AET&CD), in Alexandria, Va., where she serves as Liaison to the Defense Acquisition University. Previously, she worked as a Procurement Analyst and Professor of Contracting, Defense Systems Management College Norfolk Campus, Norfolk, Va.

Through AcqDemo, Echols and his team are seeking to demonstrate and validate that the effectiveness of DoD acquisition can be enhanced by allowing greater managerial control over personnel processes and functions and, at the same time, expand the opportunities available to employees through a more responsive and flexible personnel system.

AcqDemo, they envision, will provide managers, at the lowest practical level, the authority, control, and flexibility they need to achieve quality acquisition processes and quality products. And according to Echols, this project not only provides a system that retains, recognizes, and rewards employees for their contribution, but also supports their personal and professional growth.

“Although we have some challenges ahead of us that must be worked out,” Echols said at the AcqDemo Spring 2002 Seminar held in Orlando, Fla., “AcqDemo is definitely moving forward, and leading change throughout the DoD AT&L workforce.”

The “Heart” of AcqDemo
The “heart,” if you will, of AcqDemo is that every organization has a mission; and each individual in that organization should be contributing to that mission, regardless of the position he or she holds. Therefore, it must first be determined if the organization itself has been successful at accomplishing its mission; and if for some reason it has not, then unfortunately the employees’ contributions as a whole have also missed the mark. If, however, the organization is



“Although we have some challenges ahead of us that must be worked out, AcqDemo is definitely moving forward, and leading change throughout the DoD AT&L workforce.”

—Anthony D. Echols
PM, DoD Civilian Acquisition
Workforce Personnel
Demonstration Project

on target in supporting and accomplishing its mission, then the employees who contributed to that success should and will be adequately compensated.

“By design, AcqDemo forces non-performers to take one of two actions,” according to Leslie Bordelon, Executive Director, Air Force Flight Test Center, at Edwards Air Force Base, Calif.: “Improve or move on.”

People—No. 1 Asset

Bordelon, a strong supporter of AcqDemo and guest speaker at the recent Florida seminar, explained that “successfully managing a contribution-based pay system requires a lot of work; however, people are our number one asset and we should be devoted to mentoring, training, and appraising them. We are probably doing now what we should have always done. We are now doing [AcqDemo] at Edwards.”

Show Me the Money

One question that I and many others who are trying to gain a better understanding of AcqDemo were curious about was: *Is it possible for the employee to lose money when transitioning into the AcqDemo pay system?*

The answer is no, the employee will not lose money when transitioning into the project. In fact, in two of the training courses offered by the AcqDemo Program office—“Contribution-Based Compensation Appraisal System (CCAS) Process,” designed for employees entering into the program, and “Human



Recruiting, retaining, and rewarding high contributors are the best ways to accomplish the mission; and longevity will no longer be the basis for reward. Low contribution and no contribution will no longer be tolerated.

Resource Management 101,” designed for managers administering the program—employees are encouraged, based on a specific formula, to work through their individual buy-in process. The AcqDemo training team is confident that engaging the employee in the process helps to promote understanding and confidence in the system.

Pay Pools/Panels

Pay pools and pay pool panels were additional areas I researched to better understand AcqDemo. I learned that the typical size of a pay pool ranged from 35 to 300 people; however, this size standard is a recommendation, not a regulation. Employees working in acquisition organizations, in acquisition positions, as well as the support staff within the organization, are those who make up the pay pool.

Once supervisors have evaluated employees, those evaluations are submitted to the pay pool panel. The pay pool panel members are senior managers in the organization who collectively decide the value of the employee's contribution. The pay pool manager is the ultimate deciding official within the pay pool panel.

Claude M. Bolton Jr., ASA(ALT)

In a recent interview I conducted with Claude M. Bolton Jr., the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, and also the Executive Agent for AcqDemo, Bolton expressed his views on a contribution-based pay system.

“Having a contribution-based pay system is not anything new,” he said. “The Alternative Personnel System at China Lake started over 20 years ago.”

Bolton sees AcqDemo as leading the way to a single Department-wide system and acknowledged that there will be challenges along the way such as “normal resistance to any change, issues to be worked out with unions, and lack of technology,” to name a few.

“The flexibility,” he contends, “that AcqDemo provides managers; the ability to



“By design, AcqDemo forces non-performers to take one of two actions: improve or move on.”

—Leslie Bordelon
Executive Director
Air Force Flight Test Center
Edwards Air Force Base, Calif.

reward and retain high contributors; and helping to expedite the hiring process are all reasons to push forward with the effort.”

Bolton is very optimistic and anticipates continued implementation at a rapid rate. He also expressed his conviction that *communication* is not only a key element for successfully implementing AcqDemo, but for effective management of any program.

“I have always sat down and talked with the people I managed,” he recalled, “at least twice per year, military and civilian, senior leader and support person—[even] more than twice when required. The fact that a mid-year and final year review is required under AcqDemo will not be a major change for managers run-

ning successful organizations. We've always done it that way.”

Last, Bolton emphasized the importance of training for managers, supervisors, and employees. “If anything has slowed us down,” he maintained, “it's probably lack of training. We need more training, on a recurring basis—once is definitely not enough.”

A Constant Theme

One constant theme emerged from my personal research, individual training, and interviews with senior acquisition leadership on contribution-based pay systems such as AcqDemo: *The mission of the organization is the focus.* Recruiting, retaining, and rewarding high contributors are the best ways to accomplish the mission; and longevity will no longer be the basis for reward. Low contribution and no contribution will no longer be tolerated.

So how much are we contributing to the mission of our organizations? It seems fairly obvious that the first step is to know and understand the organization's mission and how what we do fits into and supports the mission. Next we must seek out any and all training needed to help us learn how best to implement and work effectively within our organization. Last, but certainly not least—*communicate.* Ask questions; seek out answers; share information, as well as lessons learned.

Our DoD senior acquisition leaders recognize that change can be difficult, but when it results in a better qualified, more effective and efficient workforce, they will choose the best course of action. As expressed recently by Under Secretary of Defense (Acquisition, Technology and Logistics) E.C. “Pete” Aldridge Jr., “Maintaining the status quo is no longer an option.”

Editor's Note: Richard welcomes questions or comments on this article. Contact her at Marcia.Richard@dau.mil.

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DARPA System Looks to Provide Artillery Support

JIM GARAMONE

ARLINGTON, Va., June 14, 2002—The original concept was called “Rockets in a Box.” It’s “Net Fires” today, said Brad Tousley, program manager at the Tactical Technology Office of the Defense Advanced Research Projects Agency [DARPA] here. The program takes rocket artillery into new realms of accuracy and portability, he said.

Net Fires is one alternative system the Defense Department is looking at to provide artillery support in place of the Crusader artillery system. Defense officials want to stress accuracy in artillery fire and bring to Army and Marine Corps groundpounders the same capabilities that precision-guided munitions have brought to Air Force, Navy, and Marine Corps aviators.

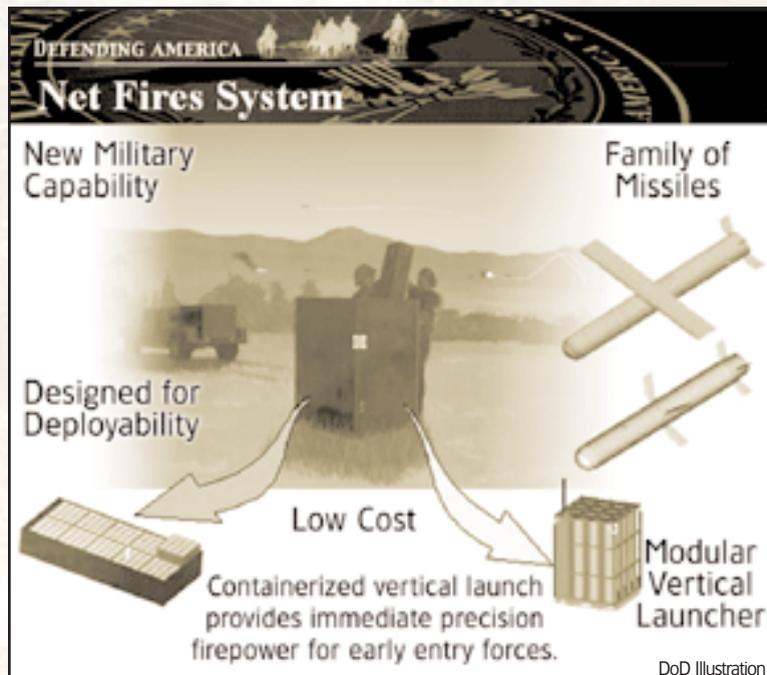
“It is a concept for a vertical-launch set of missiles with a command and control sys-

tem in a box,” Tousley said. “It was designed to be platform-independent.”

Normal cannon and other rocket artillery systems depend on their launch platforms. “We wanted to make a box where much of the engineering work for the munition was taken care of in the factory,” he said. “The round in its launch canister is a complete entity.”

Being in a box means Net Fires launchers can be mounted on a Humvee or a truck, or set up on the ground, he said. The idea is to let the Army’s Future Combat System integrate Net Fires into the different launch configurations.

The system as designed today is a box with 16 sections. Fifteen hold rockets, and the



last contains command and control gear. The box has its own power system.

The rockets fire from the canister like the Navy's Vertical Launch System. Back-blast follows the missile out the front of the launcher so there's no impact on any transport vehicle.

The rocket system is "soft launch," Tousley said, meaning that the rocket doesn't experience high G's as would an artillery shell traveling at high speed. "There's just enough to get [the missile] out of the box and move it forward," he said.

Planners have found that vertical launch is better from the standpoint of tactical deployment. "You can put it just about anywhere," Tousley said. "Traditional artillery today—you have to put those on reverse slopes of hills. You have to put them where the firing location forward is clear."

He noted that if you [position] a box with a vertical-launch configuration, you could pinpoint its impact point: "It's going to go straight up and out," he said.

This also enables the system to engage targets in all 360 degrees.

Net Fires will have two missiles.

The first is a precision attack missile being developed by Raytheon Corp. The missile travels at high speed for minimal time to target or to reach maximum range, Tousley said. It will have a solid-fuel rocket motor, an uncooled infrared seeker, and will mount a substantial warhead. "This is the heavy tank killer," he said.

The second is a loitering attack missile being developed by Lockheed-Martin and Raytheon. It will carry a laser detection and ranging ("ladar") seeker, a turbojet motor, and wings that extend on launch. The missile will have a 70-kilometer range with a 30-minute loiter time, Tousley said.

"This is very achievable," he said. "It will be able to loiter over targets of interest, do automatic target recognition, and attack targets on its own."

Both missiles will have an onboard datalink. With proper integration into the Future Combat System, which is one of the challenges of the project, Tousley said, Net Fires rounds could be directed to the target by forward observers, unmanned sensors, or "whoever is forward."

Any needed target updates could be sent to the missile through the datalink, he said.

The missiles then would be fired into a Global Positioning System "basket." On the way there, the rounds are handed off to forward personnel or unmanned sensors such as a Predator unmanned aerial vehicle.

"When I fire an artillery piece or an MLRS [Multiple Launch Rocket System], it's gone. It's not going to be affected (once it is in the air)," Tousley said. "All my command and control is at the launch point."

"Now we're going to give them the capability to interact so if your target is moving and you want to update the location, you can. If you want to 'lase' it, you can. It gives you more capability, but it is going to mean challenges operationally," Tousley said. "Of course, that's part of DARPA's job to push and to challenge."

Some testing of the system has already taken place. Testing will continue into 2004. The Army then would decide whether to continue the program.

If all goes well, Net Fires could be ready for units in 2008.

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

Human Systems Integration (HSI)

Ensuring Design & Development Meet Human Performance Capability Early in Acquisition Process

JAMES J. CLARK • ROBERT K. GOULDER

Human systems integration (HSI) considers areas such as: *manpower, personnel, training, human factors engineering, system safety, personnel survivability, and health hazards*. In simple terms, HSI focuses on human beings and their interaction with everything in the environment associated with DoD systems. (A sidebar on p. _ describes all seven of these areas in detail.)

HSI is a comprehensive management and technical strategy for human systems integration that is initiated early in the acquisition process to ensure that the design and ultimate development meet human performance capability. These capabilities include cognitive, physical, and sensory skills required for training and using a system. The human-machine interface applies to all C4I [Command, Control, Communications, Computers and Intelligence] systems, automated information systems, and weapons systems.

Each military service has a specific name for the HSI process. For example, the Army's effort (located at the Pentagon) is called MANPRINT [Manpower and Personnel Integration]. The Navy's effort (located at Johnstown, Pa.), formerly called HARDMAN [Hardware/Manpower Integration], is now called HSI—the subject of this article. The Air Force's effort (located at Brooks AFB, Texas), formerly called IMPACTS [Integrated Manpower, Personnel, and Comprehensive Training & Safety], is now also called HSI. The Marine Corps' effort (located at Quantico, Va.) was also called



Commercial and military customers need to be involved throughout the entire design process to ensure their Human Systems Integration (HSI) requirements are met.

Clark is an adjunct professor for Florida Institute of Technology, Fort Lee, Va. **Goulder** is a professor at the Fort Lee Center, DAU Mid-Atlantic Region, Fort Lee, Va.

HARDMAN. It too is now called HSI. Regardless of the Service name, all HSI efforts will consider many specific areas. These areas will be described in the objectives of each Service program. For example:

- Influence design for optimum combined human/machine system performance.
- Ensure that system conforms to the capabilities and limitations of the operator, maintainer, and other support personnel.
- Improve control of the total life cycle costs of the system.
- Ensure system safety and compliance with health standards.

Service design goals also include things like minimizing acclimation time for drivers, fast and easy loading of ammunition or equipment, built-in diagnostic and fault isolation, and reducing death and injury through compartmentalization of ammunition and fuel.

Organizational Process

DoD 5000.2-R, *Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs*, signed April 5, 2002, suggests that an Integrated Product Team (IPT) be established early in the acquisition process to address HSI. In the past, the Army referred to these teams as MANPRINT Joint Working Groups (MJWG). With the revision of the 5000-series documents in 1996 and again in 2002, the Services should call them HSI IPTs. However, the Army continues to call them MANPRINT IPTs. The Air Force, Navy, and Marine Corps refer to these as HSI IPTs. The Services should develop specific management plans to address HSI for each system being developed.

Some HSI data are initially derived from the Mission Need Statement and the Operational Requirements Document (ORD). Ideally, the HSI Plan should be written before the ORD and used to help formulate the ORD. The Analysis of Alternatives (formerly the Cost & Operational Effectiveness Analysis), the Test

Calculation for System Performance Army Stinger (Using Various Aptitude Categories)		
EQUIPMENT PERFORMANCE (P_e)	HUMAN PERFORMANCE (P_h)	SYSTEM PERFORMANCE (P_s)
(.80) X	AFQT CAT I-III A (.67)	= (.536)
(.80) X	IIIB (.58)	= (.464)
(.80) X	IV (.48)	= (.384)

and Evaluation Master Plan, the Support Plan (sometimes known as the Integrated Logistics Support Plan), and other documents supplement the basic data as the IPT develops the HSI Plan for a system. These plans identify goals and constraints, concerns, tasks, trade-offs, and proposed analyses for the specific system being addressed.

The HSI Plan is a living document that changes as the system evolves. Typical information includes planning for inventory, force structure, standards of grade, skill and knowledge descriptions, anthropometric data, physical qualifications, aptitude descriptions, training history, and task performance. The IPT for HSI will typically be composed of the user and representatives from various disciplines, e.g., safety centers, research labs, health promotion/preventive medicine, engineers/designers, materiel developers, training developers, logisticians, contractors, developmental and operational testers, personnel commands, and Human Factors Engineering (HFE) personnel.

Analytical Process

As our commercial and military system designs become more complex, the aptitude requirements and maintenance problems generally increase. Pratt & Whitney's new PW4098 engine, with over 60,000 parts, is probably the most complex model assembly ever constructed. Many commercial computer aided design (CAD) packages exist to help designers develop a graphics system to display digital products for their customers.

Commercial and military customers need to be involved throughout the en-

tire design process to ensure their requirements are met. Human capability demands the integration of many simple and complex aspects in the operation and support of weapons systems. Some examples are physical demands, sensory demands, and cognitive demands. Each of these demands will change depending on the complexity of the item. For example, the use of hand tools will be different from that of electromechanical machines, and even more difficult for complex human-machine systems. HSI serves to assess these characteristics while still in the concept development.

Each Service has a variety of analytical tools and databases to develop HSI information. For example, in HFE the Army Research Laboratory may use Jack and Hardman III, while the Air Force may use Crewcut. Jack is also available to other Services and even to the private sector for commercial development of HSI. Overall, the tools can range from simple surveys and mock-ups to modeling, simulation, and expert systems. Simple calculations can be performed to predict system performance in various environments.

For example, consider the calculation for system performance for the Army's Stinger using various aptitude categories. The statistics were compiled using test scores from the Armed Forces Qualification Test (AFQT) categories (CAT I through IV) in a training environment. The basic formula is expressed in the sidebar above.

The data reveal that human involvement degrades the Stinger's overall system performance. Therefore, for highly com-

Definitions and Explanations of HSI Terms

MANPOWER—Manpower is defined as the number of human resources, both men and women, military and civilian, required and available to operate and maintain a system. Demographic projections indicate the statistical availability of manpower for the military. For example, a shortage of 18-year-old males was noted for the years 1992 and 1993 only if the force structure had anticipated a need in excess of 2 million military personnel.

PERSONNEL—The definition of personnel is the aptitude, experience, and other human characteristics necessary to achieve optimal total system performance. Human characteristics include four basic areas: Cognitive (aptitude, ability, knowledge); Physical (sex, senses, size, strength, stamina); Psychomotor (coordination, dexterity); and Experience (civilian, military, education, interests).

TRAINING—Training is defined as the requisite knowledge, skills, and abilities needed by available personnel to operate and maintain systems under operational conditions. Some examples of training include formal institutional, on-the-job, embedded, and simulation. Training must also consider the intended target audience, training strategies, and cost impact.

HUMAN FACTORS ENGINEERING—HFE is defined as the comprehensive integration of human characteristics into the system definition, design, development, and evaluation to optimize the performance of human-machine combinations. HFE also is concerned with reducing the probability that a human will make an error in the operation, maintenance, or support of a system; and with the degree to which an individual is able to accomplish a task, or series of tasks, under specific conditions, to meet a specified standard. Some examples of HFE problems are as follows: continuous operations; low light levels; environmental conditions such as cold, heat, noise, or NBC [nuclear, chemical, biological]; disruptive wake/sleep cycles; mental (information) overload; stress; or physical fatigue.

HFE analysis would further refine and attempt to reduce these problems by employing many cognitive and visualization techniques. An illustration of one study, trichromatic vision, noted that prolonged viewing of a computer screen can result in temporary myopia, eyestrain, blurred vision, headaches, and neck aches. To reduce these computer-related problems, HFE data would suggest the following:

- Working in an environment with the correct lighting.
- Using correct posture in relation to the computer.
- Developing a bigger screen or using higher resolution.
- Blinking more often while using the computer.
- Resting the eyes and stretching several times per hour.

In reconciling these hardware and human differences, the HSI and HFE effort would strike a balance between all areas. The balance is the training given to the appropriate users of the equipment. For example, the DoD generally directs training toward those people who fall within the anthropometric range. The anthropometric range accommodates 90 percent of the

population (the 5th to the 95th percentile). However, people outside this range are difficult to train or will not accommodate the equipment used by DoD. For example, anyone under 4'9" is too short to drive a truck or anyone over 6'3" is too tall to drive a tank. Therefore, three scales exist: one for the male population, one for the female population, and one for both populations. Equipment designated for combat organizations (with a male population) will normally use the male scale for equipment development.

SYSTEM SAFETY—System Safety is defined as the inherent ability of a system to be used, operated, and maintained without accidental injury to personnel. System safety is controlled primarily through identifying and "designing-out" problem areas early in the development; and later through accident prevention methods and techniques. HSI IPTs must analyze each component of the CAD design to redesign or remove any potential problem areas.

PERSONNEL SURVIVABILITY—Survivability from an HSI perspective is defined as the characteristic of a system or individual that can reduce fratricide; as well as reduce detection of personnel; prevent damage if attacked; minimize medical injury if wounded; and reduce physical and mental fatigue. For example, efforts to reduce weight, drag, and radar detection on aircraft. The design efforts can potentially increase range, maneuverability, and survivability for future fighter aircraft.

Some examples of general personnel survivability include: warning sensors, maneuverability, life support systems, NBC hardening, flak vests, vaccines, prophylactic drugs, eye and ear protection, and radar/acoustic/thermal/microwave detection.

HEALTH HAZARDS—Health Hazards are defined as the inherent conditions in the operation or use of the system that can cause death, injury, illness, disability, or reduced job performance of personnel. Health hazards are found in weapons, munitions, equipment, clothing, training devices, and many other materials. Hazards are classified according to severity, by category:

CATEGORY HAZARD

- I CATASTROPHIC—may cause death or system loss.
- II CRITICAL—may cause severe bodily injury, severe occupational illness, or major system damage.
- III MARGINAL—may cause minor bodily injury, minor occupational illness, or minor system damage.
- IV NEGLIGIBLE—may cause less-than-minor bodily injury, occupational illness, or minor system damage.

These severity categories describe the damage inflicted to people and equipment as a result of acoustical energy, vibration, oxygen deficiency, temperature extremes and humidity, trauma, biological substances, chemical substances, shock, or radiation energy. System safety and health hazards also consider the survivability of the personnel and equipment. These same categories of severity are used extensively in logistical applications (e.g., Failure Modes Effects and Criticality Analysis) to assess personnel and equipment survivability. The combination of safety and survivability are compared against various levels of probability.

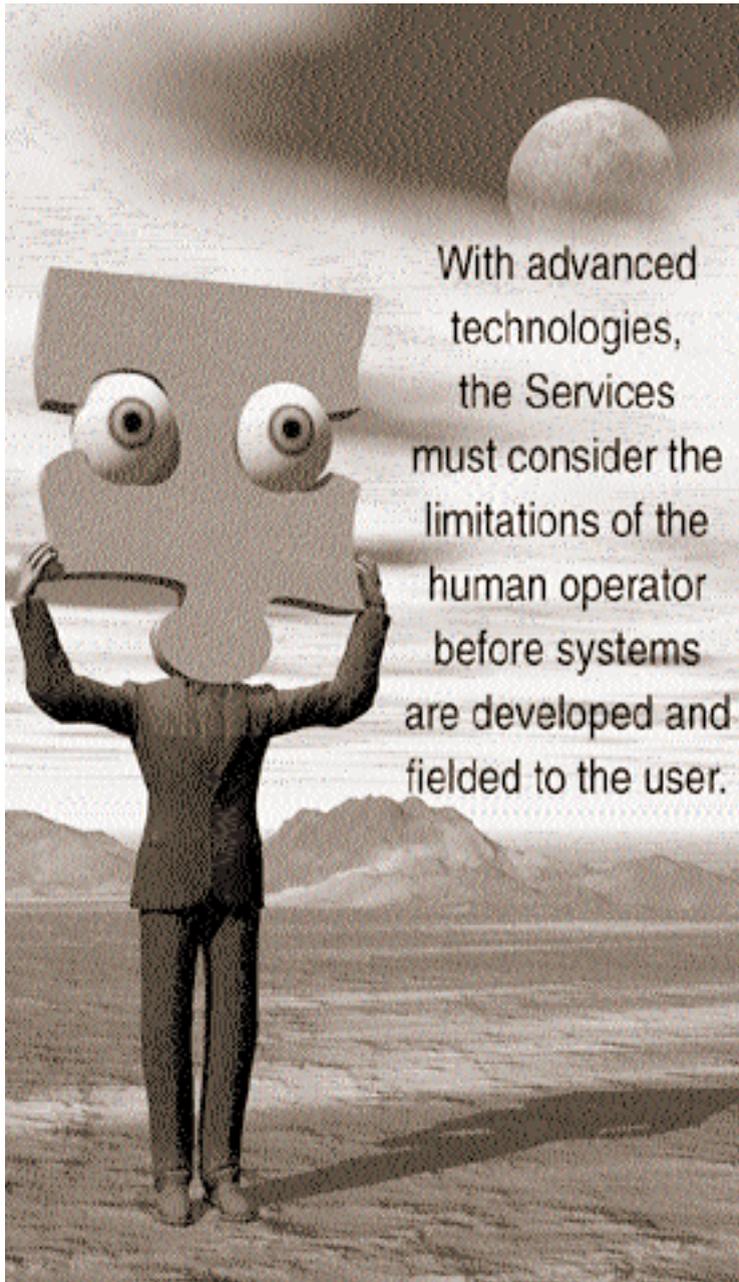
plex weapons systems like the Stinger, some of the alternatives might be as follows:

- Make the design simpler for the operator.
- Train the operators longer.
- Use personnel with higher aptitudes.
- All or none of the above.

Each alternative has merit, but each alternative also has a price. Ultimately, the determining factors in the acquisition process will be cost, schedule, performance, and the trade-offs made between these (and other) parameters.

Another Army example is the T800 engine used in the Comanche helicopter. The human requirement called for no increase in aptitude (from its predecessor engine—the T700 in the OH-58 helicopter) and to reduce the number of maintainers. The resulting HSI effort reduced organizational tool kits from 64 to eight—a substantial accomplishment! The reduction also included a reduction in the number of maintenance tasks. Finally, the manpower manhours were reduced by 14 percent and the reliability of the system was increased. With advanced technologies, the Services must consider the limitations of the human operator before systems are developed and fielded to the user.

To aid in this process, automated modeling processes are used to replicate thinking, perceiving, and acting before systems designs are finalized. For example, Jack is a human factors anthropometric CAD file that uses highly interactive 3D tools to help reduce limitations or find areas needing improvement. Jack looks at posture, reach-



ing, bending, twisting, center of mass, strength, balance, joint limitations, range and motion, eye-to-machine contact, and icon recognition. Jack has the capability to analyze: body weight, mass, size, upper- and lower-area limb evaluations, total body muscle assessments, body area and density, basal metabolic rate analysis, and evaluation of energy allowances.

CAD is capable of incorporating other automated tools and has substantially improved system designs. For example, the Integrated Graphics Robot Instruction Program (IGRIP) and Computer-

Aided Three-Dimensional Interactive Application (CATIA) add extra capabilities to a 3D CAD model by simulating worker functions, predicting desired ergonomic outcomes, helping to reduce start-up and cycle time, increasing reliability of the design model, and reducing risk to the ultimate system. CATIA and IGRIP were of tremendous value developing such major systems as Boeing's 777, the New Attack Submarine, Comanche RAH-66, F-22, Joint Strike Fighter, LPD-17, Enhanced Fiber-Optic Guided Missile, Crusader, Advanced Amphibious Assault Vehicle, AIM-9X, and Ballistic Aerial Target.

Ultimately, HSI data are translated into training manuals, operator and maintainer warnings, and sometimes posted directly on equipment. The physical translation is usually performed by the contractor using a government-approved logistical database (i.e., SLIC/2B, LEADS, ATLAS, DEC, L-BASE, LISA-2B). The contractor integrates all of the data from the government and data generated by

any other contractors to correlate the requested HSI effort.

Without HSI, weapons systems would be less effective and more difficult to operate and maintain. With HSI, soldiers, sailors, airmen, and Marines have a better chance to fight and win with today's highly technical and sophisticated systems. HSI remains a viable and cost-effective program for our military.

Editor's Note: The authors welcome questions or comments on this article. Contact them at clarkj@lee.army.mil and goulderr@lee.army.mil.



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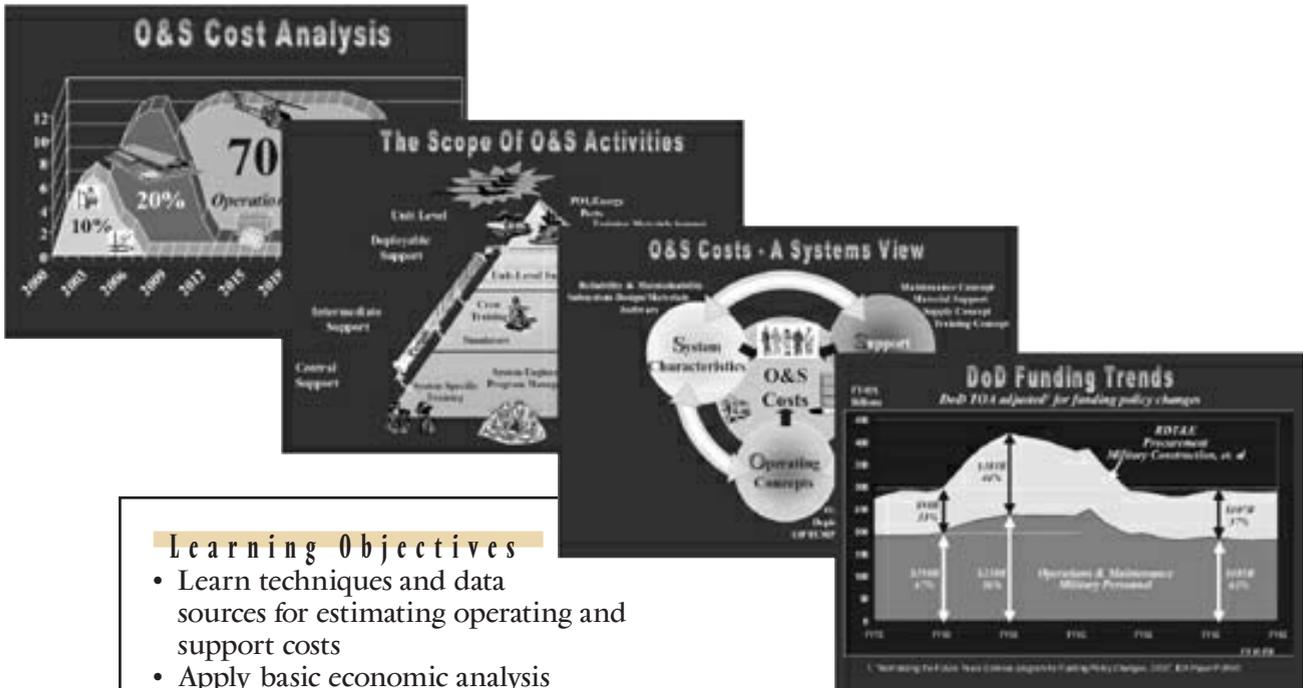
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“Transforming Acquisition and Logistics Support for the Warfighter”

DAU Hosts Program Managers’ Workshop

LEON REED

The Program Managers’ Workshop, held at the Defense Acquisition University Fort Belvoir campus April 30 through May 2, completed the first full-year cycle of major acquisition community conferences under the leadership of Under Secretary of Defense for Acquisition, Technology and Logistics (USD[AT&L]) Edward C. “Pete” Aldridge Jr.

Whereas the Program Executive Officers/Systems Command (PEO/SYSCOM) Commanders’ Conference held last fall

concentrated on top-down and lateral communication of policy initiatives, the spring Workshop provided an opportunity for more intense evaluation of the acquisition and logistics processes and development of new recommendations for Office of the Secretary of Defense (OSD) and Service leadership.

Conference Breakout Groups

Following a keynote address by retired Navy Adm. Donald Pilling, President and CEO, Logistics Management Institute, conference participants opted to

participate in one of nine Breakout Groups, each of which focused on key acquisition and logistics support issues. The Breakout Group discussions took most of the day on May 1, after which Group chairs prepared summary reports on their groups’ discussions and recommendations. (The Breakout Group topics are discussed and the group reports summarized, beginning on p. 97 of this article.)

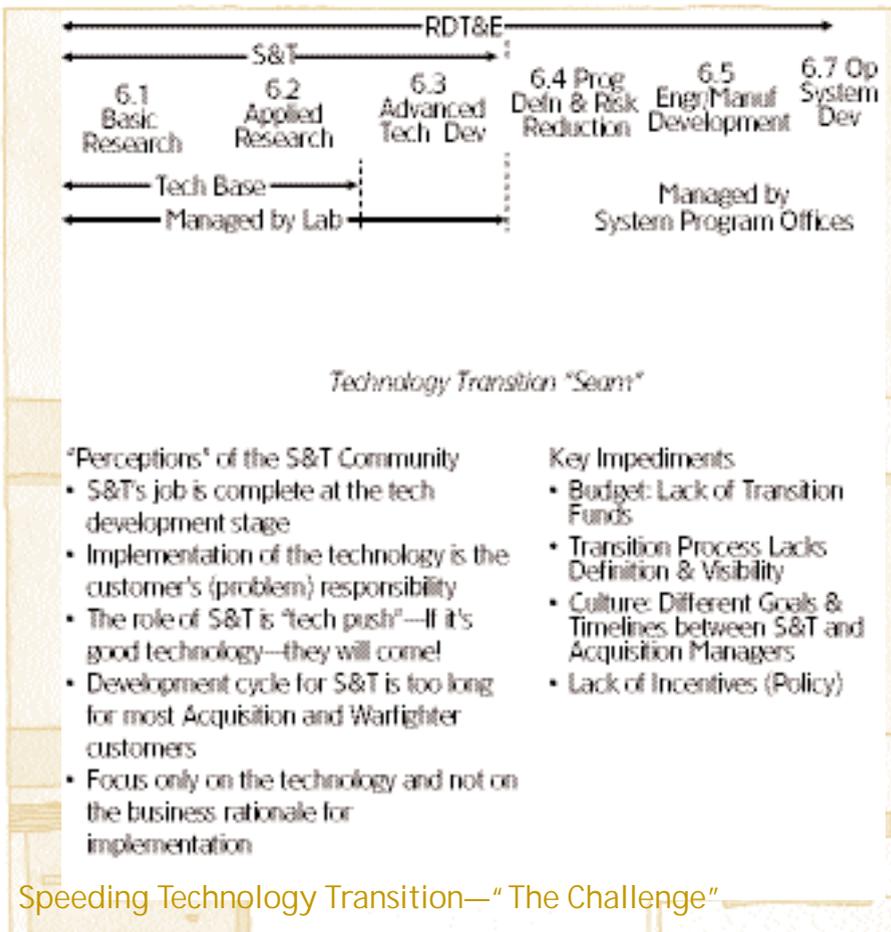
Evening Presentation

After the first day’s meetings, Dr. Ron Sega, Director of Defense Research and Engineering (DDR&E), presented an evening address on his perceptions of the role of DDR&E in supporting defense transformation. He discussed six key capabilities identified by the Quadrennial Defense Review (QDR):

- Protect Bases of Operations
- Conduct Information Operations
- Project and Sustain U.S. Forces
- Deny Enemy Sanctuary
- Conduct Space Operations
- Leverage Information Technologies

Sega also discussed the “technology transition seam,” a perceived gap in the process between Science and Technology (S&T) funding (typically managed by DoD labs) and program funding (managed by program offices). Principal barriers to technology transition, according to Sega, often include cultural differences between the S&T and acquisition managers, lack of funding and clear processes for transition, and lack of incentives for either S&T or acquisition managers.

To the left is a chart Sega discussed on the importance of more effective tech-



Speeding Technology Transition—“The Challenge”

Reed is a member of the research staff, Institute for Defense Analyses, Alexandria, Va.

WORKSHOP TUTORIALS

Preceding the Workshop was a set of tutorials on new initiatives and policy issues of interest to the acquisition community. Although it was held on a separate day from the other workshop activities, the attendance of 225 indicated a high level of interest on the attendees' part. Topics were:

Requirements Generation, Navy Capt. Kevin Peppe, Branch Chief, Strategic and Tactical Systems Requirements, J-8

Milestone Authority, Ric Sylvester, Deputy Director, Acquisition Initiatives (Systems Acquisition)

Intellectual Property Rights, Air Force Lt. Col. Greg Redick, Military Staff Analyst, Weapon Systems Acquisition, Policies and Training, Office of the Director, Acquisition Initiatives

International Programs as an Acquisition Strategy, Frank Kenlon, Office of the Director of International Cooperation

Shared Savings Incentive, Carol Covey, Deputy Director, Defense Procurement, Cost, Pricing and Finance

Public-Private Partnerships for Depot Maintenance, Hollis Hunter, Office of the Director for Maintenance Policy, Programs and Resources

Using Earned Value Management Tools to Reach Program Outcomes, Steve Krivokopich, Director, EVM Center of Excellence, Defense Contract Management Agency (DCMA)

Overhead Insights, "What Program Managers Need to Know," William Hill, Deputy Director, Contract Cost and Pricing Group, DCMA

A Human Performance Approach to Develop System Requirements, George Horn, Head Naval Undersea Training Branch, and Dr. Janis Cannon-Bowers, Senior Scientist and Head,

S&T Division, Naval Air Warfare Center Training Systems Division

Acquisition of Services, Mike Canales, Office of the Director for Acquisition Initiatives

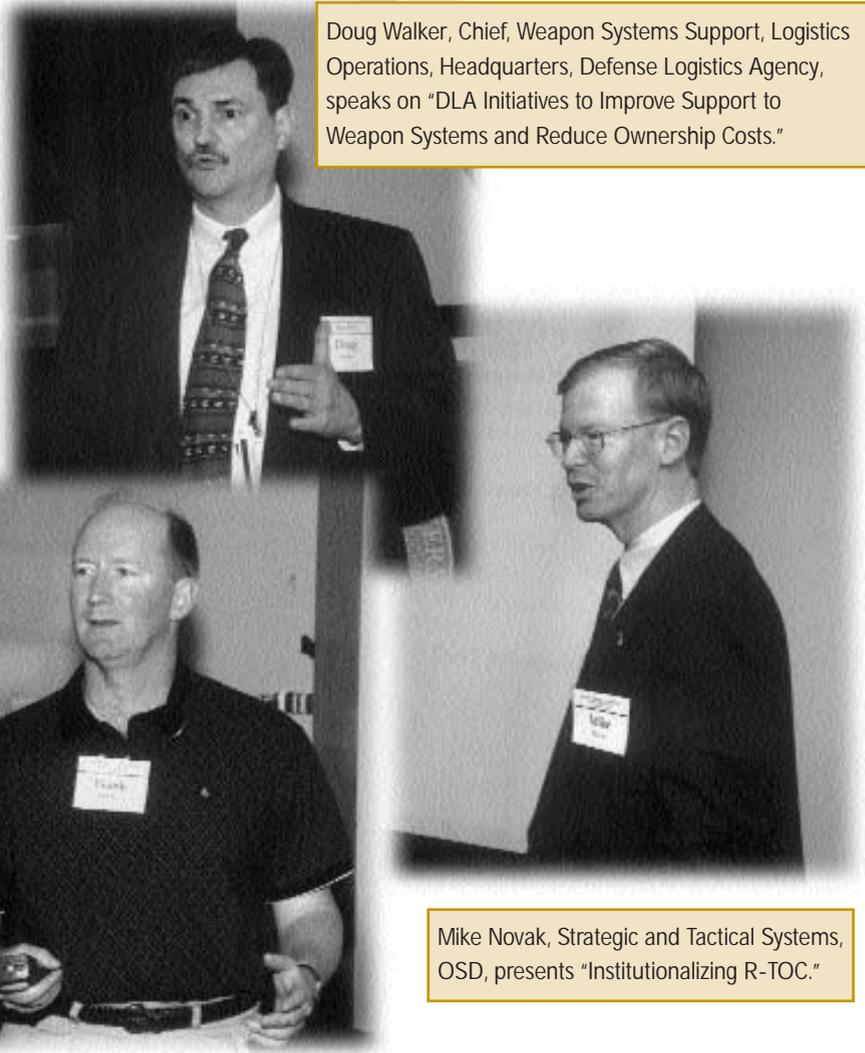
Small and Disadvantaged Business Issues, Frank Ramos, Director, Small and Disadvantaged Business Utilization

Export Controls, Dr. John Shaw, Deputy Under Secretary of Defense (International Technology Security)

Institutionalizing R-TOC, Michael Novak, OSD, Strategic and Tactical Systems and Leon Reed, Institute for Defense Analyses

DLA Initiatives to Improve Support to Weapon Systems and Reduce Ownership Costs, Douglas Walker, Chief, Weapon Systems Support, Logistics Operations, Headquarters, Defense Logistics Agency

Acquisition 2005 Workforce: "Managing the Crisis," Peggy Mattei, Director, Workforce Initiative, Acquisition Education, Training, and Career Development



Doug Walker, Chief, Weapon Systems Support, Logistics Operations, Headquarters, Defense Logistics Agency, speaks on "DLA Initiatives to Improve Support to Weapon Systems and Reduce Ownership Costs."

Frank Kenlon, Office of the Director of International Cooperation, speaks on "International Programs as an Acquisition Strategy."

Mike Novak, Strategic and Tactical Systems, OSD, presents "Institutionalizing R-TOC."

nology transition. Pointing out specific examples where it has worked effectively, Sega said that technology transition is the path to military transformation, and S&T managers and acquisition managers must work in collaboration with warfighters to promote more effective transition.

Program Lessons Learned

The final morning session began with a series of briefings on lessons learned in managing acquisition, logistics support, and modernization for aging systems. Each Service selected one program to illustrate innovative approaches in acquisition and logistics support.

Advanced Maintenance Aid Concept (Army)

Ron Dalton, Chief Logistics Management Division of the Army Cargo Helicopter Project Management Office (PMO) described the efforts of the CH-47 Chinook program to develop the Advanced Maintenance Aid Concept (AMAC) to help manage fleet maintenance records.

AMAC is an electronic maintenance management system that integrates technical data, data collection, and training into a single user-friendly system. It also serves as an organizational tool to provide maintenance tasks to the maintainer in a work package format. AMAC enables maintenance organizations to understand the reasons behind increases in operations and maintenance (O&M) costs or reduced reliability.

Dalton said that current maintenance efforts are a challenge because of increasing maintenance requirements for this aging system. The system is growing more complex, but technical data are still manual and the experience level of maintenance personnel is declining as the most experienced maintainers retire. Past efforts to reduce ownership costs were hindered by lack of information on actual consumption and attrition of parts and components.

While the system is still in development, it has already provided important insights to the Cargo Helicopter PMO. For one, only 34 percent of parts removals

from the aircraft are due to parts failure; other removals, which contribute to high O&M costs and low systems readiness, are due to policy and procedures.

AMAC has documented the sources of aircraft downtime and has allowed the

Cargo PMO to take actions to address the root causes. Other systems managers, including most of the Army Reduction in Total Ownership Costs (R-TOC) pilot program managers, have been briefed on AMAC, and the program has stimulated considerable interest.



Attending panel outbriefs are from left: Defense Acquisition University President Frank Anderson Jr.; Ric Sylvester, Office of the Director, Acquisition Initiatives, OUSD(AT&L); and Donna Richbourg, Director, Acquisition Initiatives, OUSD(AT&L).



Senior acquisition leaders from government and industry listen to panel outbriefs. From left: Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics) Michael Wynne; Assistant Secretary of the Army (Acquisition, Logistics and Technology) Claude Bolton; Assistant Secretary of the Air Force (Acquisition) Marvin Sambur; and Daniel Burnham, CEO Raytheon.

Assault Amphibious Vehicle (Navy/Marine Corps)

Edward Lerner, Program Manager, Combat Tracked Vehicles, described efforts to modernize and upgrade the Assault Amphibious Vehicle (AAV). The AAV was built in the early 1970s, with an anticipated 10-year service lifetime. By 1997, Lerner noted, “we were in dire straits.” The system had far exceeded its service life and it was old, slow, and expensive to maintain. Engineering Change Proposals (ECPs) had increased the vehicle weight by three tons and it was severely under-powered. The PMO had been re-

mance. Lerner cited four key lessons learned from the AAV systems upgrade:

- IPTs work.
- Find the right metrics.
- Address concerns of stakeholders.
- Change takes time.

Defense Support Program (Air Force)

Air Force Col. Mark Borkoski, System Program Director, Space Based Infrared Systems (SBIRS), described evolutionary improvements in satellite capabilities, acquisition, and business practices

realistic testing, and continuous interaction with warfighters.

Longer than anticipated satellite life has allowed the program to achieve the benefits of a number of cost-reduction initiatives, including reduction of contractor personnel and reduced acquisition costs. The program office and contractor team have also leveraged Electronic Data Interchange (EDI) capabilities to eliminate hardcopy deliverables and promote sharing of information and schedules.

Borkoski cited five Best Practices from the SBIRS program:

- Best results are achieved when the program can evolve and improve based on demonstrated success.
- Continual investment in ground processing improvements is essential to maximize utility and leverage past investments in highly capable satellites.
- Most often, simpler is better. Program managers should actively seek opportunities to simplify the program by routinely examining the environment and capitalizing on the innovation of the program office, contractor staff, and the latest technology.
- Duplication is avoided and responsiveness to operations is enhanced when the program office shares resources (lean) and tasks are well defined (focused).
- The Added In-Scope Work Briefing (AISWB) is a prudent tool to provide programs the needed flexibility to respond to a range of emerging needs (fact-of-life, improvements, cuts, taxes, etc.).

Breakout Group Reports

The Breakout Group chairs presented briefings to a panel of DoD's leading acquisition decision makers, which included Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics Michael Wynne and the three Service Acquisition Executives—Claude M. Bolton Jr., Assistant Secretary of the Army (Acquisition, Logistics and Technology); John J. Young Jr., Assistant Secretary of the Navy (Research, Development and Acquisition);



Senior acquisition leaders during a break in conference activities. From left: Wynne; Richbourg; and Assistant Secretary of the Navy (Research, Development and Acquisition) John Young.

duced from 70 people to four and was slated to stand down in a few years. Decreased reliability and increased time in depot had reduced the number of available vehicles far below what was required.

The solution was a plan to revitalize the PMO and involve the contractor and depot in planning and executing a system upgrade. The engine and suspension were replaced and other key components were rebuilt. The result has been a successful upgrade, which has improved fleet readiness and perfor-

that have expanded the capabilities of the Defense Support Program (DSP). DSP was originally developed as a strategic missile launch warning system but its capabilities have expanded to include tactical missile launch warning and situational awareness.

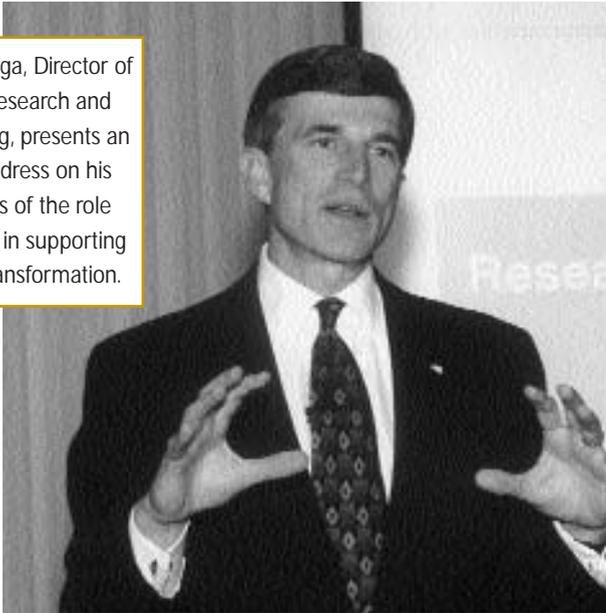
The program office has continually monitored system performance, evolution of satellite and sensor capabilities, and warfighter needs. New capabilities have been developed and deployed via rapid prototyping, streamlined acquisition,

PROGRAM MANAG

APRIL 30 — M

Nine Breakout Groups Focus on Key A

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Air Force Col. Mark Borkoski, System Program Director, Space Based Infrared Systems (SBIRS), speaks on evolutionary improvements in satellite capabilities, acquisition, and business practices that have expanded the capabilities of the Defense Support Program (DSP).



Terry Little, Director, Air Force Acquisition Center of Excellence, presents findings from Breakout Group No. 6 on "Incorporating Evolutionary Acquisition into Requirements, Test and Budgeting."

ERS' WORKSHOP

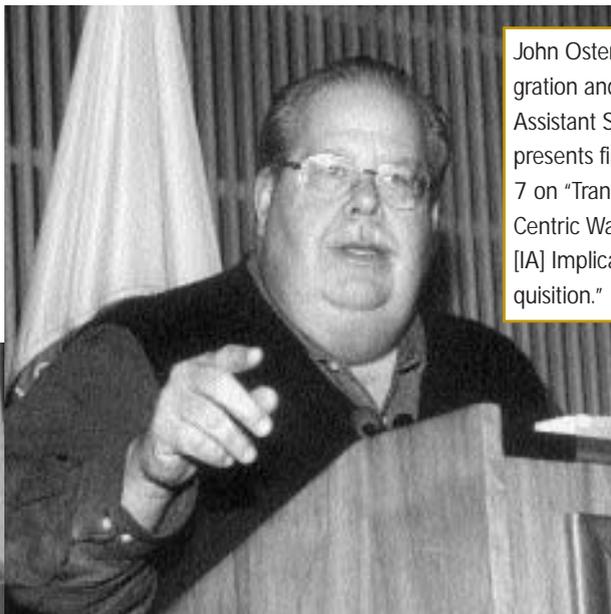
DAY 2, 2002

Acquisition & Logistics Support Issues

Kristen Baldwin, Assistant Deputy Director, Software Intensive Systems Office, presents findings of Breakout Group No. 2, on Software Intensive Systems and Information Technology.



John Osterholz, Director, Information, Integration and Interoperability, Office of the Assistant Secretary of Defense for C3I, presents findings from Breakout Group No. 7 on "Transformation Toward Network Centric Warfare (Information Assurance [IA] Implications & Considerations for Acquisition."



Al Shaffer, Director, Plans & Programs, S&T, presents findings of Breakout Group No. 1, on Improving Technology Insertion.



As the Workshop's final event, participants had the chance to engage in a candid, hour-long Q&A session with Principal Deputy Under Secretary of Defense (AT&L) Michael Wynne and John Douglass, former Navy Service Acquisition Executive and current President of the Aerospace Industries Association.

and Dr. Marvin R. Sambur, Assistant Secretary of the Air Force for Acquisition.

Although each breakout group addressed a different issue, there was significant overlap in the presentations. Issues that were addressed by multiple groups resulted in five specific recommendations:

- Support evolutionary acquisition with evolutionary requirements and test.
- Provide enhanced training in new policies, procedures, and practices.
- Promote technology transition planning during research and development.
- Provide greater funding flexibility for Program Managers.
- Incorporate logistics/sustainment considerations in development and acquisition plans.

Breakout Group No. 1

Improving Technology Insertion (co-chairs, Al Shaffer, Director, Plans & Programs, S&T, and John Gresham, Deputy PM, Night Vision/Reconnaissance, Surveillance, and Target Acquisition)

Shaffer presented the findings of the Technology Transition Group, which further divided into subgroups that addressed policy, process, and funding. Despite the different approaches taken by the three subgroups, there was overlap in their findings and recommendations. The three groups identified four top barriers to Improving Technology Insertion:

- No transition “czar.” The group recommended appointment of a senior manager in each Service with budget authority.
- Industry and PM not incentivized. Technology insertion planning should be made a part of the up-front planning for all acquisition programs.
- Lack of flexible funding. The group recommended establishment of execution year programs and increased reprogramming authority.
- Inflexible requirements process. A spiral requirements process is needed to match the new DoD thrust in evolutionary acquisition/spiral development. The group also recommended

implementation of capabilities-based requirements.

Breakout Group No. 2

Software Intensive Systems and Information Technology (co-chairs, Kristen Baldwin, Assistant Deputy Director, Software Intensive Systems Office; Joe Albergo, Senior Program Analyst, Office of the Director for Acquisition Resources and Analysis; and Tamie Lyles-Santiago, Special Assistant to the Deputy Chief Information Officer, Office of the Assistant Secretary of Defense for Command, Control, Communications and Intelligence [C3I], OSD)

Baldwin described the recommendations of the Software Intensive Systems group. This group focused on three key issues: IT Acquisition Rapid Improvement Team (RIT), Process Improvement, and Independent Expert Program Reviews (IEPRs).

The IT RIT has developed 23 recommendations for DoD policy, has started six pilot efforts, and has six more ready to be phased in. The Breakout Group recommended continued focus on these RIT actions.

Regarding process improvement, the group noted that existing policy of evaluating major contractors under the Software Capability Maturity Model (SW-CMM) Level 3 (or equivalent) appears to be working. There is general agreement that CMM Level 3 (or higher) contractors perform better and have a higher probability of success than less mature organizations and that increased maturity levels lead to earlier identification of problems.

However, there are barriers to more widespread use, including resources for education and training within government organizations and the difficulties of small and disadvantaged businesses in meeting CMM policies. The group recommended a variety of actions to promote more widespread implementation of CMM, including development of an education package, increased use of the Mentor/Protégé program for small and disadvantaged firms, and investigation of the use of incentives.

The group concluded that IEPRs have been useful tools for the PMs who have used them and that the current guidelines (limiting the IEPRs to providing guidance to the PM rather than oversight) were critical to their success. They advocated more widespread use of these expert reviews and follow-ups with programs to gauge the utility of their recommendations.

Breakout Group No. 3

Effective Marketing, Recruiting, and Hiring (co-chairs, Michael Fish, Deputy Assistant Commander, Shore Station Command, and Dr. Joseph Lannon, Director, Warheads, Energetics, and Combat-support Armament Center)

Steve Tkac (OUSD[AT&L]), group recorder, presented the briefing. Although it has received less attention than the imminent retirement of a large portion of the AT&L workforce, workforce retention is also a serious potential problem for AT&L managers. The private sector provides formidable competition for experienced federal civilian workers. DoD must also focus more effectively on recruiting and hiring, which is not a function DoD is well set up to do. The DoD AT&L workforce does not have a “brand” in the marketplace, human capital requirements are not linked to the strategic vision, the web presence is unfocused and ineffective, and DoD has traditionally been unable to develop a unified human capital strategy. The breakout group concluded that leadership attention was needed to address these shortfalls.

Breakout Group No. 4

Performance Based Logistics (PBL) Strategy (co-chairs, Lou Kratz, Assistant Deputy Under Secretary of Defense for Logistics Plans and Programs, and David Werkheiser, Engineering, Logistics and Technology, Northrop Grumman)

Kratz noted that DoD is committed to implementing PBL strategies, and current PBL programs are showing success. Nevertheless, important barriers remain, including cumbersome financial processes that inhibit PBL. A balanced

approach is needed for long-term partnerships, and measures must be taken to enhance the ability of organic providers to function as true partners.

Kratz noted that multiple strategies will be necessary, tailored to unique program and warfighter requirements; no “one size fits all” strategy will work. He also acknowledged that the migration to the PBL will take time because of the necessary learning curve on implementation. OSD can help accelerate the learning curve by providing revised guidance, including an update of the *Product Support Guide*, joint government/industry workshops, joint team training, and a lessons learned repository.

However, he said that if PMs are responsible for life cycle management, as DoD has asserted, DoD must provide them with financial authority, including streamlined financial processes and appropriate sustaining engineering funding. Warfighter flexibility can be provided through ranges of support within performance agreements. DoD must also address the barriers to organic provider performance and accountability.

Breakout Group No. 5
Developing Performance Based Agreements for Logistics (co-chairs, Jerry Cothran, Senior Staff Analyst, Office of the Assistant Deputy Under Secretary of Defense for Logistics Plans and Programs, and Bob Dickie, General Manager, Customer Support Military Division, Parker Aerospace)

Cothran noted that performance agreements are a critical element in implementing Performance Based Logistics. The agreement defines expectations, sets the baseline for assessing PM performance, and ensures accountability in meeting warfighter requirements.

The breakout group considered various dimensions of the problem. The roles of the various stakeholders are undefined and poorly understood. In particular, means for assuring organic provider accountability are not defined.

Evolutionary acquisition poses a particular challenge because of the poten-

tial conflict between a baseline agreement and a shifting weapon system configuration. Financial systems currently do not provide good weapon system cost visibility, which complicates the challenge of developing agreements. Improved life cycle cost estimating and weapon system cost visibility are necessary for widespread use of performance agreements. Definition of metrics is a challenge across the board.

Legacy systems, with an already existing support infrastructure and wide variations in the condition of existing systems, are a particular challenge. DoD also needs to develop guidance on implementation of performance agreements and accountability for organic providers

Breakout Group No. 6
Incorporating Evolutionary Acquisition into Requirements, Test and Budgeting (co-chairs, Terry Little, Director, Air Force Acquisition Center for Excellence and Glenn Kuller, Deputy Program Director, Joint Air-to-Surface Standoff Missile, Lockheed Martin)

Little stated that his group had identified a number of potential issues relating to Evolutionary Acquisition (EA), but had focused on technology, requirements, test, budget and resource allocation, impact to industrial base and competition, and training and culture change.

Little commented that “if we’re going to do spirals effectively, we have to take a different approach to the technology that supports spirals.” Spiral development requires ready-to-integrate technology, but the current lab process is not focused on developing mature, producible technology. The breakout group recommended that users should drive technology investment decision processes, with some allowance for “technology push” investments developed within the labs.

Little stated that “our current requirements process doesn’t really support spiral development. Our current requirements process is set up for ‘big bang’ acquisition. We need a require-

ments process with a much more flexible, iterative requirements document.” The group recommended streamlined Service and Joint Staff requirements processes and retitling the Operational Requirements Document (ORD) to Iterative Requirements Document (IRD).

Little also noted that implementation of EA will have important implications for other DoD organizations. Testing currently is envisioned as a “final exam,” rating the performance of a system against a definitive specification; under EA, the test process should assess capabilities and shortfalls, with the warfighter making the final determination whether the new system provides a useful capability.

The group also concluded that current Planning, Programming and Budgeting System (PPBS) procedures do not support EA timelines and will need to change. The current budget processes anticipate a fully defined system, whereas under EA it may be more appropriate to create broad program elements to support general capabilities and enhancement areas, with the current spiral fully defined and funded before beginning development efforts.

Breakout Group No. 7
Transformation Toward Network Centric Warfare (Information Assurance (IA) Implications & Considerations for Acquisition) (co-chairs, Army Col. Gene Tyler, Director, Defense-wide Information Assurance Program and John Osterholz, Director, Information, Integration and Interoperability, Office of the Assistant Secretary of Defense for C3I)

Osterholz noted that Information Operations (IO) and Information Assurance (IA) are key operational capabilities of DoD transformation efforts. Network Centric Warfare (NCW) is one of six major transformation areas and its capabilities enable much of the transformation. The achievement of NCW capabilities will be influenced not only by DoD’s ability to acquire the computing and network technologies, but to be sure that IA is an integral part of the de-

signs, concepts, engineering developments, and logistics support.

The group acknowledged that there are significant barriers. The acquisition process will have difficulty implementing NCW. In essence, a process friendly to NCW must be created, with increased emphasis on educating PMs and providing incentives. In particular, Osterholz noted that the current interoperability Key Performance Parameter (KPP) is inadequate to reflect the requirements of NCW. The group recommended that DoD should substitute a "net-readiness" KPP that incorporates interoperability and other IA parameters.

Breakout Group No. 8

New R&D Approaches to Sustainment (co-chairs, John Christensen, Chief, Research and Development (R&D), Enterprise Division, Defense Logistics Agency, and Jack White, Technology Director, Altarum, Inc.)

Christensen briefed on the results of this panel, which had a wide-ranging discussion on a variety of issues affecting sustainment needs of legacy as well as new systems. This was perceived to be an extremely broad topic, involving a variety of initiatives and investments to improve system readiness, reduce logistics footprint, provide technology refreshment in weapon systems, improve supply chain responsiveness, and reduce costs, among other objectives.

Options for investments and improvements include reliability upgrades, integrated diagnostics and prognostics, supply chain improvements, rapid response manufacturing, obsolescence solutions, and a wide variety of other opportunities.

The group concluded that the challenge is to reduce ownership costs while continuing to meet readiness goals. Research and Development (R&D) investments can enable transformational improvements, but the mission and resources for sustainment R&D are not clearly assigned. Barriers include poor quality of data, a culture that is resistant to new logistics practices, and the inability of cost models to give PMs a true picture

of life cycle sustainment costs. PMs have limited control of life cycle funding (including sustainment engineering funds), and color of money rules significantly limit the flexibility to invest in sustainment R&D.

Breakout Group No. 9

Embedding Quality in AT&L Processes (co-chairs, Fred Stahl, Stakeholder Co-Director, MIT/Lean Aerospace Initiative and Jon McKenzie, Director, Raytheon Six Sigma)

McKenzie presented the results of this group's discussions. The group concluded that many of the tools and techniques that have been successfully applied to manufacturing processes, notably quality and lean tools, may also help improve the quality and reduce cycle time in R&D, systems acquisition, logistics, and sustainment. Agreeing that there is considerable potential for improvement, the group concluded that management commitment will be necessary.

The group also identified barriers that prevent this, including the need to define "the customer" and the fact that metrics and objectives are not flowed down. They recommended that AT&L develop an improvement process modeled on the Six Sigma/Lean approach. Recommended pilot projects include the bid and proposal process, the requirements process, and the milestone approval process.

Conference Wrap-up

Daniel Burnham, President and CEO of Raytheon, presented a lunchtime address on Six Sigma, his company's approach to quality. He stressed that the ultimate purpose of the quality focus was to "get these systems into the hands of the warfighters faster." While very proud of the costs his company's quality focus has saved, he stated that "It's not just the money; we've also taken vast amounts of time out of the process."

As the Workshop's final event, participants had the chance to engage in a very candid, hourlong Q&A session with Wynne and John Douglass, former Navy

SAE and President of the Aerospace Industries Association.

Wynne stressed the importance of the acquisition process in improving system reliability and performance. "We need to design ultra-reliability into the system... Why do we design stuff that's going to break and need repair?"

He also noted that military capability is the ultimate purpose of the acquisition process, not creating logistics support. To illustrate his point, he drew an analogy from out of the Old West.

"I want strategic deployability and mobility," said Wynne. "When Geronimo showed up, he had firepower and mobility, not the wagon train. We had the wagon train, and we still do. We need to pester the requirements people and pester the engineers to bring us a reduced footprint."

Douglass offered a challenge to the PMs in the audience. "Our PMs have to lead," he said. "Being a leader encompasses a lot of things. You have to be straightforward, you have to bring the information forward, and that means you have to tell your boss when you're winning and when you're losing. Clearly, you have to stick up for your people, and there are some very difficult problems in the world you live in."

Thanking the participants for their suggestions and participation, Wynne assured the conferees that recommendations emerging from the Conference will be integrated into the existing OSD action plan. He said he had already spoken by phone to the SAEs and that they had already begun to look into several of the recommendations, only a few hours after the Breakout Group presentations were completed.

Editor's Note: Presentations at the April-May 2002 PM Workshop and earlier conferences and workshops in this series are available on the workshop Web site: <http://www.acq.osd.mil/ar/peoindex.htm>.



First Production AIM-9X Rolls Out to the Warfighter

The first production next-generation AIM-9X Sidewinder was unveiled May 1 during a ceremony at Raytheon facilities in Tucson, Ariz. This delivery marks the beginning of an 18-year production plan to provide revolutionary dogfight capabilities to the warfighter.

"Air-to-air tactics as they exist today will no longer be the same," said Capt. Dave Venlet, Naval Air Systems Command program



The next-generation AIM-9X Sidewinder missile. NAVAIR photo

manager for Air-to-Air Missile Systems (PMA-259). "This is an advanced system design, which provides the warfighter with the firepower to ensure air superiority against any threat that exists today."

AIM-9X changes the rules of the dogfight through a system design approach that incorporates a fifth-generation staring focal plane array seeker for robust guidance per-

formance and infrared countermeasure capability and jet vane control for extremely agile turning performance.

The AIM-9X's seeker has near instantaneous slew rates, and achieves extremely high off-boresight angles for threat acquisition and first shot opportunity. Pilots are no longer required to point the aircraft's nose at the target to employ this advanced weapon system.

AIM-9X has undergone an extensive flight testing program, which has been complemented by an accredited modeling and simulation capability. The missile is fully reprogrammable in the field to allow for enhancements and growth in response to advances in threat capabilities.

The program has had an unprecedented 18 successes in 19 guided flights and a total of 37 successes in 39 launches in less than two years.

The missiles being delivered today will be initially used for pilot training, and for at-sea and forward deployments within the next year. Initial operating capability for the U.S. Navy, Air Force and Marine Corps is planned for the summer of 2003.

Editor's Note: This information is in the public domain at www.navair.navy.mil.



Army Col. Ronald J. Hayne became the Director, Operations Group, effective June 24, 2002. He joins DAU from the National Security Space Architect, Fairfax, Va., where he served as Chief, Information Technology and Analysis Division. Previously, he has held a wide variety of command and staff positions, including Air Defense Artillery Technology Manager for the

Weapons Technology Directorate of the U.S. Army Research Laboratory, Aberdeen Proving Ground, Md.; Executive Officer to the Commanding General, U.S. Army Space and Strategic Defense Command, Arlington, Va.; Associate Professor and Director of the Computer Engineering Group, Department of Electrical Engineering and Computer Science, United States Military Academy, West Point, N.Y.; and Commander, Battery A, 1st Battalion, 62^d Air Defense Artillery, 25th Infantry Division, Schofield Barracks, Hawaii. A member of the Army Acquisition Corps, he holds an undergraduate degree from the United States Military Academy at West Point, a master's degree in Electrical Engineering from the University of Arizona, and a Doctorate in Electrical Engineering from the University of Virginia.



Retired Navy Capt. Dave Fitch became the Dean, Defense Systems Management College—School of Program Managers (DSMC-SPM), effective May 16, 2002. He previously served as the Deputy Dean, DSMC-SPM, a position to which he was appointed in November 2001. Prior to joining DSMC-SPM, Fitch served for seven months as the

DAU Executive Director, Curricula Development and Support Center. He first joined DAU-DSMC from private industry, where he spent three years with Rockwell-Collins in Rosslyn, Va. Immediately prior to his tenure at Rockwell, Fitch retired from the U.S. Navy on Oct. 1, 1998, where he served as Program Manager of the Multifunctional Information Distribution System (MIDS)—a Packard Award-winning program.

Air Force Col. William P. McNally became the Air Force Chair, DAU Executive Institute, effective June 24, 2002. Prior to becoming the Air Force Chair, McNally served as the DAU Director of Operations and Air Force Element Commander. As the Air Force Chair, he will retain his duties as DAU's Air Force Element Commander. Previously,

McNally served as Professor of Contract Management, DSMC, from 1993 to 1996. He joined DAU for the second time as the Air Force Element Commander and Deputy Provost in July 2000. Prior to joining DAU, McNally served as Military Deputy to the Deputy Under Secretary of Defense (Acquisition Reform) and the Director, Defense Reform. Commissioned through the Reserve Officer Training Corps in 1977, McNally has 24 years' experience in the acquisition and contracting communities. His past assignments include serving as a Contract Negotiator; Industrial Specialist; Contracting Officer; Director of Contracts; Commander, Defense Plant Representative Office; and Contracting Policy Branch Chief within the Air Force Secretariat. A graduate of the U.S. Air War College, he holds an undergraduate degree from Manhattan College and an M.B.A. from Golden Gate University. He is a graduate of the DSMC Program Management Course, is Level III-certified in the field of Contract Management, and is a certified Joint Specialty Officer.





Navy School Offers Officers MBA Degrees

SGT. 1ST CLASS KATHLEEN T. RHEM, USA

WASHINGTON, May 16, 2002—Military officers and DoD civilians can now earn a defense-focused masters of business administration degree through the Naval Postgraduate School in Monterey, Calif.

The program covers all the elements of a typical MBA program, but focuses some of the material on military-specific issues, according to Douglas Brook, dean of the institution's Graduate School of Business and Public Policy.

Brook said this is the only defense-focused MBA program in the country.

Military officers, typically in the O-3 to O-4 ranks, attend the school for 18 months on a resident basis. Brook explained that most of the officers are from the Navy, but officers from other services and civilians are welcome to apply.

The first 50 students in the program began their coursework in January, and another 100 begin studies this summer. Brook explained new classes will start twice each year.

In September, the school will enter into a partnership with the University of Maryland to offer the same degree on a nonresident basis in Washington. Classes will meet on Saturdays with Maryland professors and instructors teaching the common subjects and military-specific subjects being taught by visiting faculty from Monterey or through distance-learning methods.

"We're taking our basic MBA program here and offering it to a different population of students—people who would never be able to come to Monterey on a resident program but

would like a defense-focused MBA," Brook said.

He said he expects 12 to 25 DoD civilians to enroll in the new program here this year.

The defense-focused MBA has three pieces, Brook said. A business core will reflect subjects covered in other MBA programs, but with a DoD focus. For instance, subjects might include economics for a defense manager, and an organizational design course would focus on defense organizations, Brook explained.

A mission-related segment of coursework would include broad courses aimed at defense management, including courses in DoD strategy and policy, DoD resource determination, e-business for defense, and the budget and appropriations process.

The third piece of this degree is what Brooks called an individual concentration. "They'll concentrate course work on areas in which they might be assigned," he said. "This way they'll get what they need in terms of more direct professional qualifications."

He said individual concentration areas can include acquisition and contracting, logistics, financial management, human resource management, or information management.

Individuals seeking more information on the defense-focused MBA programs through the Naval Postgraduate School should speak to their assignments manager or detailer or check the school's Web site at <http://www.nps.navy.mil>.

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

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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).

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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/cmh-pg/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.rdausa.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.dsmc.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.

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.

Risk Management

http://www.acq.osd.mil/io/se/risk_management/index.htm

Risk policies and procedures; risk tools and products; events and ongoing efforts; related papers, speeches, publications, and Web sites.

Earned Value Management

<http://www.acq.osd.mil/pm>

Implementation of Earned Value Management; latest policy changes; standards; international developments; active notebook.

Fedworld Information

<http://www.fedworld.gov>

Comprehensive central access point for searching, locating, ordering, and acquiring government and business information.

GSA Federal Supply Service

<http://pub.fss.gsa.gov>

The No. 1 resource for the latest services and products industry has to offer.

Commerce Business Daily

<http://www.govcon.com/>

Access to current and back issues with search capabilities; business opportunities; interactive yellow pages.

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.

INDUSTRY AND PROFESSIONAL ORGANIZATIONS

National Contract Management Association (NCMA)

<http://www.ncmahq.org>

"What's New in Contracting?"; educational products catalog; career center.

National Defense Industrial Association (NDIA)

<http://www.ndia.org>

Association news; events; government policy; *National Defense* magazine.

International Society of Logistics

<http://www.sole.org/>

Online desk references that link to logistics problem-solving advice; Certified Professional Logistician certification.

Computer Assisted Technology Transfer (CATT) Program

http://catt.bus.okstate.edu/new_catt/index.html

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.



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. DAU encourages the reciprocal linking of its Home Page to other interested agencies. Contact the DAU Webmaster at: webmaster@dau.mil.

DAU MEETS NASCAR



Retired Marine Lt. Col. Garry Klaus brought a teaching tool to the main Fort Belvoir, Va., campus that students won't soon forget. Klaus, a student in DAU Professor Wayne Glass's recent class on supportability, is a professional NASCAR driver. Pictured are students of Glass's class during a hands-on demo by Klaus of the car's safety, logistics, and supportability features. (Klaus is pictured fourth from the left; Glass is on the far right.)

Photo by Army Sgt. Fahim Nassar



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