BUILDING
THE ARMY
NETWORK

Representing a Revolutionary New Approach

'TRAIL BOSSING' THE NIE

A Conversation with COL John Wendel

GROUND RULES

Army Building Foundational Software for Common Operating Environment

From the Editor-in-Chief

The network is an essential aspect of an expeditionary, 21st-century Army, particularly with technology constantly changing. This issue of *Army AL&T* Magazine focuses primarily on building the Army network, the service's No. 1 modernization priority.

A networked organization provides awareness and understanding, important requirements for leaders to be decisive across all points of conflict, for Soldiers executing missions, and for planning and operating with Joint, coalition, and interagency partners. The Army's portion of the DOD network, LandWarNet, must be completely integrated and interoperable to provide Soldiers, civilians, and mission partners information at any point and in any environment.

This issue looks at how the Army is building a true enterprise network, from creating a Common Operating Environment for foundational software, to integrating radios, waveforms, sensors, and smartphones; developing a unified Enterprise Email system; and upgrading satellite control facilities. A key focus of this issue is the Network Integration Evaluation (NIE), a series of exercises at brigade level and below starting with the NIE this June and July, which the Army views as a revolutionary approach to building and proving new network capabilities before they are fielded to Soldiers.

In addition to the Army network, this issue of *Army AL&T* Magazine devotes a special section to Better Buying Power, examining multiple aspects of how the AL&T Workforce has moved toward greater efficiency to save money, in fulfillment of former Secretary of Defense Dr. Robert M. Gates' Efficiency Initiatives. With guidance on "will-cost/should-cost" analysis from Acting Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASAALT) Ms. Heidi Shyu, a report on the findings of the Army Acquisition Review, and other in-depth articles, this section provides a detailed look at what the Army AL&T Workforce is doing to increase efficiencies.

Finally, this issue ushers in a new look, design, and feel to heighten our focus on the magazine's mission of informing and instructing the AL&T community about processes, procedures, techniques, and management philosophy. The changes implemented in this redesign stem from a combination of your feedback in our 2010 Readership Survey and recommendations from a February 2011 editorial audit of the magazine.

The magazine now offers more focused articles with more efficient organization, highlighting key topics throughout and making each article easier to find. We've also changed the look of the articles to improve readability while still relaying important information.

The overall content of the magazine will continue to be driven by priorities outlined in the Army Campaign Plan and ASAALT's seven Strategic Priorities.

As you work to fulfill your responsibilities to Army AL&T and our warfighters, I hope you look to these articles to provide new guidance and knowledge. If you have any comments or suggestions, please contact me at *USAASCWEBArmyALT-MagazineLettertoEditor@conus.army.mil*.

Nelson McCouch III
Editor-in-Chief

FEATURES

ON THE COVER
The 21st-century Army network encompasses
a wide range of capabilities to connect
front-line troops, battle command, higher
headquarters, and posts, camps, and
stations, thus providing warfighters with vital
information and situational awareness.

DESIGN ▪ DEVELOP ▪ DELIVER ▪ DOMINATE

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This medium is approved for official dissemination of material designed to keep individuals within the Army knowledgeable of current and emerging developments within their areas of expertise for the purpose of enhancing their professional development.

By order of the
Secretary of the Army

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BUILDING THE
ARMY NETWORK

'A revolutionary new approach'

by Kris Osborn

The U.S. Army has vigorously undertaken an ambitious, far-reaching Network Integration Evaluation (NIE) at Fort Bliss, TX, and White Sands Missile Range, NM, designed to simultaneously test programs of record and assess a host of emerging network technologies, Army senior leaders said.

The NIE, which began the first week of June and includes formal limited user tests (LUTs) of six programs of record and evaluation of a host of emerging or developmental technologies, is a key part of the Army's network strategy. The NIE is structured to assess the scope and readiness of emerging technologies and, where appropriate, integrate new capability before sending it downrange to Soldiers in combat.

A key aim of the NIE is to help the Army field current technology faster, to ensure that Soldiers maintain the technological edge over our adversaries. At the heart of the exercise is an overarching effort to develop a single battlefield network able to connect dismounted Soldiers to other units in real time, linking them to command posts, vehicles on the move, and higher headquarters. The Army wants to use the best available technologies to move more information, voice, video, data, and images faster, farther, and more efficiently across the force.

"The network will literally redefine how we fight," said GEN Peter W. Chiarelli, Vice Chief of Staff of the Army. "Ultimately, the network will connect leaders and Soldiers, Sailors, Airmen, and Marines at all levels, at every echelon of command, in any formation, and across the entire team, with the right information quickly and seamlessly. And in doing so, I am confident it will make our various formations more lethal, faster, and survivable in today's battlefield."

TARGET TECHNOLOGIES

Central to the NIE is the continued evaluation of nonproprietary high-bandwidth waveforms such as Soldier Radio Waveform (SRW) and Wideband Networking Waveform (WNW), which use a larger portion of the available spectrum than legacy waveforms to move voice, video, images, and data in real time across multiple nodes in the force.

NETWORKED FIREPOWER

Soldiers from the 2nd Brigade Combat Team, 1st Armored Division practice a fire mission during Week 2 of the Army's NIE at White Sands Missile Range. (U.S. Army photo by Claire Heininger Schwerin, Program Executive Office Command, Control, and Communications-Tactical (PEO C3T).)

> **"** AS WE DELIVER THE COMMON OPERATING ENVIRONMENT IMPLEMENTATION PLAN AND WE TALK ABOUT THE TECHNOLOGY STANDARDS THAT WE ARE GOING TO PUT IN THERE AND ARTICULATE TO INDUSTRY, **WE'RE NOW GOING TO SCOPE WHAT OUR CAPABILITY GAPS ARE ON THE BATTLEFIELD. "**

The waveforms, and indeed many of the technologies, are designed with standards aimed at meeting the needs of all the services in order to accommodate the potential for joint service involvement in the network.

"We're working very closely with partners up at OSD [Office of the Secretary of Defense] in laying this out. I've invited them all [the other services] out to see what we're doing. I see this evolving very, very quickly into a test bed that can be used not just by the United States Army, but by all services," Chiarelli said.

Overall, the technologies being evaluated include a wide range of capability, such as software-programmable radio, satellites, sensors, and smartphones. Some of the programs undergoing formal LUTs are:

- Joint Tactical Radio Systems Handheld, Manpack, and Small Form Fit radio, a multi-channel, Soldier-mounted, software-programmable radio able to transmit voice, video, data, and images using high-bandwidth waveforms such as SRW and WNW.
- Joint Capabilities Release, next-generation software for Force Battle Command Brigade and Below display screens, featuring Army-Marine Corps interoperability and advanced mapping tool kits.

- Mounted Soldier System, a combat vehicle-Soldier ensemble that integrates advanced gear, such as a helmet-mounted display.
- Network Integration Kit, a vehicle-mounted communications hub.
- SPIDER, a remote munitions delivery system.

In addition to these five systems undergoing formal LUTs, the NIE is experimenting with more than 25 emerging technologies, such as smartphones and personal digital assistants, to zero in on the best emerging technologies that can benefit Soldiers in combat.

"The reality is, these NIEs are as much about learning as they are about testing. After all, the only way to fix problems is to accurately identify them. Likewise, the most effective means for developing new, relevant doctrine and tactics is to conduct integrated network-enabled training exercises," Chiarelli said.

'REVOLUTIONARY'

The rationale for the NIE is to evaluate all of these technologies in relation to one another from a system-of-systems perspective in a combatlike environment.

"We can evaluate new capabilities across the potential spectrum of conflict. We can evaluate them in terrain that our

units are really having to deal with today in line-of-sight and non-line-of-sight challenges," said MG Keith C. Walker, Commanding General, Brigade Modernization Command, who oversees the Network Integration Center at Fort Bliss. "If there is a capability that has merit, we can evaluate it and get feedback, not just on the material, the technical material piece, but what are the implications of this equipment on our doctrine, on how we organize, how we train, and how we develop leaders."

The NIE is aimed at refining the acquisition of new technologies and blending programs of record with commercial-off-the-shelf solutions, as part of an agile process designed to keep pace with rapid technological change, Army leaders explained.

"The Army will buy what it needs, when it needs it, for those who need it. This allows us to buy less, more often, and incrementally improve network capability over time. Simply stated, I see these NIEs not as evolutionary events but as representing a revolutionary new approach that will potentially change how we provide new capabilities in the future," Chiarelli said.

STANDARDS SET

Furthermore, new and emerging technological solutions will have to adhere to the standards articulated by the Army's

JTRS CAPABILITY

A Soldier from the 2nd Brigade Combat Team, 1st Armored Division uses the Joint Tactical Radio System (JTRS) Ground Mobile Radio inside his vehicle to exchange information with higher headquarters during the NIE. (U.S. Army photo by Claire Heininger Schwerin, PEO C3T.)

Common Operating Environment (COE), a set of computing standards designed to maximize interoperability among systems and create an environment where new applications can be built and integrated more easily, Army leaders explained.

As part of its approach, the Army is asking industry to present mature technical solutions that fill identified gaps in the network and fit within the parameters of the COE.

"As we deliver the Common Operating Environment implementation plan and we talk about the technology standards that we are going to put in there and articulate to industry, we're now going to scope what our capability gaps are on the battlefield," said LTG Susan S. Lawrence, Army Chief Information Officer/G-6.

INTEGRATE, THEN ISSUE

The NIE and subsequent exercises are geared toward speeding up and improving the way new networking technologies are delivered to Soldiers, in part by ensuring that the integration of new capability is properly solidified before items are sent into combat.

"I think we'll figure out how to use [DOD Instruction] 5000.2 maybe to get things through the system quicker than we used to get them through the system. And at the same time, I think it's going to help us with the ONS/JUONS [Operational Needs Statement/Joint Urgent Operational Needs Statement] process in ensuring that we're not sending something down to a commander that looks real good on paper, sounds real good when demonstrated as an individual product, but when

you try to integrate it with everything else you got down there, you realize you've got problems," Chiarelli said.

"Right now any technical integration issue in theater must be fixed in theater. We owe it to our Soldiers to do better. And with the establishment of the Network Integration Center, we will bear that integration burden, not our Soldiers and commanders downrange. That's the right answer," he said.

KRIS OSBORN is a Highly Qualified Expert for the Assistant Secretary of the Army for Acquisition, Logistics, and Technology Office of Strategic Communications. He holds a B.A. in English and political science from Kenyon College and an M.A. in comparative literature from Columbia University.

NIE
At a Glance

GEOGRAPHIC REALISM

Soldiers from the 2nd Brigade Combat Team, 1st Armored Division are encamped near a "mountain village" to evaluate networked capabilities in realistic terrain. (U.S. Army photo by Claire Heininger Schwerin, Program Executive Office Command, Control, and Communications-Tactical.)

WHAT IS IT?

The Network Integration Evaluation (NIE) is the first in a series of semiannual evaluations designed to integrate and mature the Army's tactical network. The combined test and evaluation approach, a major change for the Army, demonstrates a holistic focus on integrating network components simultaneously in one operational venue.

The primary purpose is to conduct parallel limited user tests of several Army programs of record, with a secondary purpose to less formally evaluate developmental and emerging network capabilities. The exercise will also assess developmental non-networked capabilities.

The culminating event in late 2012 will help slate the content for the first Network Capability Set to be fielded to deploying brigades in the 2013-14 timeframe. A capability set is a total package of networked and non-networked hardware and software fielded to a particular unit.

WHEN IS IT?

The first NIE has been conducted over a six-week period in June and July 2011.

WHERE IS IT?

Fort Bliss, TX, and the adjacent White Sands Missile Range, NM. Fort Bliss, the Army's largest land and air space in the United States—slightly bigger than the state of Connecticut—and White Sands have mountains in an Afghan-like terrain, as well as open desert in a non-Afghan-like terrain. This allows the Army to replicate an operating environment that encompasses the whole spectrum of possible conflict, whether a traditional combined-arms maneuver or an Afghan-type wide-area security operation.

ARE SOLDIERS INVOLVED?

The entire 2nd Brigade, 1st Armored Division (2-1 AD)—not a test unit, but a regular brigade combat team—are taking part in the NIE, providing continuous feedback throughout the test and evaluation process. The 2-1 AD has tanks and Bradley Fighting Vehicles, supporting a more traditional combat environment; a battalion organized as motorized infantry on the Afghan model, equipped with Mine Resistant Ambush Protected (MRAP) All-Terrain Vehicles and other vehicles used in Afghanistan; a reconnaissance squadron including a heavy troop with Bradleys, a light troop with MRAPs, and a troop with Strykers; and an artillery battalion with a light battery of M777 Howitzers and a heavy battery of M109 155mm Self-Propelled Howitzers. Again, this variety will allow the Army to evaluate new capabilities across the potential spectrum of conflict, in line-of-sight and non-line-of-sight challenges.

WHAT'S NEXT?

The NIEs initially will be every six months. Army leadership may accelerate the schedule to every four months to allow for even faster identification of capability gaps and adoption of new and emerging technologies.

The next NIE, this fall, will focus on Warfighter Information Network-Tactical Increment 2 capability. In spring 2012, the Army wants to finalize the next capability set.

The Army expects to redefine its Network Capability Sets in two-year increments. In the interim, older products will still be used; they'll have less capability than the newer model, but there will still be connectivity between systems.

For more information on the NIE, check out **http://www.bctmod.army.mil/nie_focus/index.html**.

—*From staff reports*

'TRAIL BOSSING' *the* NIE

A conversation with COL John Wendel

Leading the hardware and software integration efforts to support the Network Integration Evaluation (NIE) is COL John Wendel, Deputy Program Executive Officer (DPEO) Network Integration. Wendel is working complex system-of-systems engineering tasks to support the emerging network acquisition strategy, while overseeing the brigade-level integration, systems engineering, and test readiness of six independent Systems Under Test and more than 20 Systems Under Evaluation for the June-July NIE. Following is a discussion with Wendel on the scope, method, and ramifications of the NIE.

AGILE ACQUISITION

The series of NIEs "ultimately will help the Army make better acquisition decisions and establish a network baseline. We're forcing levels and degrees of integration that we've never thought of by pulling together schedules, performance aspects, technical requirements, and various other pieces of the pie," says COL John Wendel, DPEO Network Integration. (U.S. Army photo courtesy of PEO Integration.)

WHAT DOES THE NIE MEAN FOR THE ARMY?

We're changing our way of doing business, and the NIE is a key enabler of this. The Army is developing an agile acquisition process, to allow rapid infusion of industry and government network technology and allow for Soldier-driven evaluations of this technology during semiannual events.

What will come out of these events will be a fundamental change in how we deliver capabilities to our Soldiers. We will deliver network capabilities in sync with the Army Force Generation (ARFORGEN) process, meaning that deploying units will get the latest network capability in the form of capability sets directly linked to the two-year ARFORGEN process. Deploying units will thus receive integrated, tested, and evaluated capabilities. NIEs will help to lessen the in-field integration burden on our operational units by providing relevant operational environments in which to evaluate new technologies and capabilities that make up capability packages and sets before fielding the new systems to operational units.

The NIEs will also provide a means to evaluate relevant capabilities in parallel and make incremental improvements based upon a disciplined feedback cycle. The effort will help facilitate rapid evaluation of commercial and government network solutions to establish a network baseline and then rapidly build from it.

WHAT ARE SOME OF THE INTEGRATION CHALLENGES THE ACQUISITION COMMUNITY IS FACING, LEADING UP TO THE NIE?

When the Army fields network capabilities, not all Soldiers receive them at the same time.

Part of our challenge during the NIE is to figure out how to make sure units that have the new capabilities can talk to units that don't have all the new capabilities. It's all about proper capability integration and real-world, Soldier-driven, operationally relevant evaluations. It's a learning process, and that's what this entire community is working to solve.

Part of the challenge of ensuring proper capability integration is looking at how we can synchronize program-of-record schedules and test and evaluation events, while at the same time infusing developmental and emerging capabilities into the events. This takes an enormous system-of-systems engineering effort—something that the Army is now poised to take on coming out of the Future Combat Systems and Early Infantry Brigade Combat Team programs.

But it's more than just aligning programs; it's also forcing a culture change within the acquisition community—getting program managers and systems engineers to no longer look only at their programs as individual efforts, but instead to develop their programs to ensure that they integrate into the brigade formation and exhibit appropriate interoperability. I would argue that this change of culture is one of the biggest challenges, but we are making great headway even in this first NIE. Bringing together 30-plus capabilities within a matter of months is no small accomplishment.

WHAT HAVE YOU LEARNED SO FAR, EARLY IN THE NIE PROCESS?

One of the largest lessons learned so far is that teamwork across various and diverse Army commands is key to this effort. To conduct the NIE and to ensure proper integration throughout the Agile Process, the Army has established a triad that includes oversight from three key organizations: Program Executive Office (PEO) Integration, the Army's Test and Evaluation Command, and the Brigade

"PART OF OUR CHALLENGE DURING THE NIE IS TO FIGURE OUT HOW TO MAKE SURE UNITS THAT HAVE THE NEW CAPABILITIES CAN TALK TO UNITS THAT DON'T HAVE ALL THE NEW CAPABILITIES. IT'S ALL ABOUT PROPER CAPABILITY INTEGRATION AND REAL-WORLD, SOLDIER-DRIVEN, OPERATIONALLY RELEVANT EVALUATIONS."

NETWORK CONNECTIVITY

A Warfighter Information Network-Tactical Increment 1 Battalion Command Post Node provides network connectivity to Soldiers from the 2nd Brigade Combat Team, 1st Armored Division during Week 2 of the NIE. (U.S. Army photo by Claire Heininger Schwerin, PEO Command, Control, and Communications-Tactical.)

Modernization Command. As a team, we are looking at acquisition, test, evaluation, and requirements processes to seek a better way of doing business to get technologies and capabilities to Soldiers faster. We're here to figure out how the Army can manage capabilities that are available now and leverage technologies that may address requirements down the road that we haven't even thought of yet.

The purpose of this Agile Process is to provide a holistic and integrated approach for the acquisition, testing, evaluation, and fielding of information technology across the Army's range of operations. The Agile Process incorporates information technology from any available source including programs of record, government-off-the-shelf/commercial-off-the-shelf,

and industry development, and it provides the Army with flexibility to respond to rapidly changing requirements due to the speed of war, pace of information technology development, and changes in how the Army fights.

HOW WILL THE ARMY EVALUATE THE VARIOUS SYSTEMS IN THE NIE?

The NIE is broken into two major categories: Systems Under Test and Systems Under Evaluation. There are six Army programs of record under formal test or assessment, which will lead to an acquisition milestone for the program. These systems are driving the Army's network architectural backbone. Additionally, there are more than 20 developmental and emerging networked and non-networked

technologies categorized as Systems Under Evaluation. These technologies will be evaluated under realistic field conditions to help gauge utility, maturity, and performance in response to emerging capability requirements.

There will be three different types of evaluations during NIE. Type I will evaluate capability solutions under test—programs of record that require formal testing to achieve an acquisition decision. Type II will evaluate developing capability solutions—existing programs of record with sufficient maturity levels to accelerate, and Theater Provided Equipment. Type III will evaluate emerging capability solutions and may identify potential uses or fill gaps, receive design recommendations, or require Soldier feedback.

> "WE'RE HERE TO FIGURE OUT HOW THE ARMY CAN MANAGE CAPABILITIES THAT ARE AVAILABLE NOW AND LEVERAGE TECHNOLOGIES THAT MAY ADDRESS REQUIREMENTS DOWN THE ROAD THAT WE HAVEN'T EVEN THOUGHT OF YET."

HOW WILL THE ARMY BENEFIT FROM THE INTEGRATION WORK TAKING PLACE DURING THE NIE?

The major semiannual integration events ultimately will help the Army make better acquisition decisions and establish a network baseline. We're forcing levels and degrees of integration that we've never thought of by pulling together schedules, performance aspects, technical requirements, and various other pieces of the pie. Doing the integration work upfront at Fort Bliss, TX, and White Sands, NM, before putting these systems in the hands of our Soldiers is extremely beneficial because it alleviates having to force painful arbitration and integration work on our deployed troops.

WHAT TOOLS ARE HELPING TO FACILITATE NIE SYNCHRONIZATION EFFORTS? IN OTHER WORDS, HOW ARE YOU CARRYING OUT AN EFFORT OF THIS MAGNITUDE?

All of the program and product managers are working together for the first time. This has never been done, and while it's uncomfortable, it is very good for the Army.

We have hundreds of subject-matter experts from the test, acquisition, and requirements communities down here at Fort Bliss providing full-time support to this monumental effort. The integration scope exceeds anything I've ever seen.

We've identified trail bosses and assembled the best overlapping and complementary team to make sure we can synchronize the technologies into a composite brigade formation, while working to ensure proper instrumentation from a data collection standpoint.

The materiel development community has designated a trail boss for each of the 2nd Brigade, 1st Armored Division battalions, who have the overarching responsibility to ensure that the materiel development community is meeting all of the unit's needs for the systems in the NIE, including planning, fielding, installation, performance checkout, integration, instrumentation, support, and maintenance.

We've established a knowledge management repository to create a common operational picture across the entire Army enterprise. It's a single domain where everyone involved in the integration work can post schedules, updates, master plans, and so on.

Additionally, we've created a "horse-blanket" as a way to bring all entities together. This enables us to look at thousands of platforms across the brigade and decide where we'll put them, when we'll move equipment, and where it will go, as well as how we will improve various platforms during the process.

This is the first year the Army has undertaken this type of large-scale test and evaluation, and we've been empowered to meet this challenge and to figure out how to streamline efficiencies. These events will help inform long-term network strategy and will provide valuable feedback to develop doctrine.

We do not expect that all aspects will go perfectly during the June-July NIE, but it is important to remember that these events are not individual activities but part of a culminating process that will allow the Army to establish a network baseline and then fill it with the best applications and systems that the network can handle.

A large part of NIE's success will be attributed to taking the lessons we learn as we work to integrate the individual parts of the network into the whole, and use those lessons to help inform the process as we move into the 2012 evaluation cycle.

—By PEO Integration staff

GROUND RULES

Army building foundational software for Common Operating Environment

by Kris Osborn and Margaret C. Roth

SEEKING INTEROPERABILITY
The Army will establish and enforce stringent technical standards for software infrastructure that will guide materiel development and ensure built-in interoperability. This includes researching leap-ahead capabilities to enhance the foundation of the network modernization. (U.S. Army photo by Mike Allison.)

The U.S. Army's System-of-Systems Engineering effort has identified a number of computing environments through which to implement standards defined by the Army Chief Information Officer (CIO/G-6), service officials said. When adopted into the foundational software and hardware, these standards will define the Common Operating Environment (COE).

The intent of the COE is to allow different systems—such as battle command applications, sensors, and vehicles on the move—to communicate more efficiently.

The COE is an initiative aimed at addressing interoperability between systems and agility in development and deployment. It also focuses on an open architecture to leverage industry innovation, cyber-hardened foundations for security, and reducing life-cycle cost of systems.

The computing environment (CE) structure is geared toward organizing the Army environment from the sustaining base to the tactical edge, including sensors, command posts, mounted vehicles, handheld devices, mission command platforms, and numerous applications in real time on the battlefield, service officials explained.

STRINGENT STANDARDS

The Army will establish and enforce stringent technical standards for software infrastructure that will guide materiel development and ensure built-in interoperability, said Terry Edwards, Director of System-of-Systems Engineering for the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASAALT).

Also, the COE will be aligned to industry trends, best practices, and products while making the necessary investments in complementing security components to support DOD-unique requirements. This will enable the Army to quickly take advantage of commercial innovation and will spur competition, Edwards said.

The COE is being designed to tell industry upfront and with certainty the parameters within which Army technology (hardware and applications) must fit. The plan is to establish an ecosystem for each of the CEs so that developers have access to architectures, foundational products, and certification environments required for developing applications.

"What we are saying is, we want to go to a model where we provide these foundation pieces and make them available. That will then let everybody who wants to build applications build them on this common foundation," Edwards said.

BUILDING A FOUNDATION

Edwards compared the Army effort to commercial endeavors such as those undertaken by Apple and Google.

"If you look at what Apple and Google have done, you will see that the Apple foundation and the Android foundation have a bunch of software that determines their environment," Edwards explained. "When you go to build an app, it does not take a long time to build because a lot of the pieces are already there. All those are common pieces of software that have been provided by the Apple and Android environment. People take that software, and they build their application on top of that," he said.

"The computing environments allow us to organize our programs in such a way that there is greater efficiency due to greater collaboration among the PMs [program managers]," said Monica Farah-Stapleton, COE Lead for System-of-Systems Engineering.

A key rationale for the COE is to ensure that various mission command applications all work together on a common software foundation, Farah-Stapleton explained.

The CEs will have a minimum standard configuration that supports the Army's ability to produce and deploy high-quality applications rapidly. They will reduce the complexities of configuration and support training, as well as reduce life-cycle cost.

By focusing on the "control points," strict compliance to standards will ensure interoperability between CEs, Edwards explained.

BENEFITS TO INDUSTRY

The CE standards promise to be as valuable to industry as to the Army. "I can tell you just from the joint tactical radio environment, we've received a lot of positive feedback from industry in terms of the definition of standards," said BG Michael E. Williamson, Joint Program Executive Officer Joint Tactical Radio Systems.

CEs will allow the Army to more frequently and more clearly articulate capability gaps and to put those requests for information out faster, explained LTG Susan S. Lawrence, Army CIO/G-6.

Industry is willing and able to respond, she said. "They tell me they will spend

their research dollars, but they're afraid that they're out building something that we don't need, and they're trying to guess. And so it is on us to do a better job in communicating with industry those capability gaps and get those requests for information out faster. And we're really going to work that hard."

Staying up to date with technology will be an ongoing responsibility that industry shares with the Army, said GEN Peter W. Chiarelli, Vice Chief of Staff of the Army. "We're going to hold that [vendor] responsible to make sure that they're staying up with technology. And if they want us to keep buying their widget, their widget ... better ensure that it incorporates the advances."

SUPPORTING THE NETWORK

The scope of the COE goes well beyond procurement of tactical and operational applications, Chiarelli noted. "It's also very, very important for those things that are going to be pulling data that will allow us, across the board, to ensure that we have one network and have accessibility to all the data we need to run an organization of 1.1 million men and women."

"The network strategy is now end to end," Lawrence said. "So, as we became this 80 percent CONUS-based Army, by extending the global network to every post, camp, and station, a Soldier now can train as he fights. We can deploy with little to no notice, and to any austere environment because you're connected to the network everywhere as we work through this.

"By putting the battle command systems inside the cloud, we can extend it virtually to every post, camp, and station," she said. "So a Soldier can train in his motor pool on his battle command systems. ... In the past, they had to go to the field to train on their systems."

INTEGRATING THE TACTICAL NETWORK
Soldiers evaluate technologies and the integration of multiple programs into a larger tactical network during the Brigade Combat Team Modernization Limited User Test at White Sands Missile Range, NM. (U.S. Army photo by Richard Rau.)

The Army has already proven that it can extend the Afghan mission network to the next deployers, Lawrence said. For every unit going into the theater now, "we have put the Afghan Mission Network into their headquarters. Today it's with MG Jim Huggins [Commanding General] at 82nd Airborne Division," who meets with his counterpart in Afghanistan every day. "And that's what this end-to-end global network enterprise is going to deliver for our teams."

THE PATH FORWARD

Edwards and his team are working on establishing the framework and governance structure as part of the implementation plan to execute this vision of the COE. This is a huge undertaking that requires a change in how the Army thinks and develops systems, Edwards said.

When asked how this differs from what the Army did on the Future Combat Systems program, Edwards said, "While the concepts are the same, the idea here is to harness software from successful existing systems within a CE and establish that as 'foundational software' to build on successes."

When implemented, the COE will give the warfighter and the generating force unprecedented capability, flexibility, and agility to exploit information, Edwards added.

"We can't afford to chase technology," Williamson said. "And so what those standards do for us is to give us the ability to make sure that we are both backward- and forward-compatible as we move forward. And that's a critical piece of understanding the architecture and understanding the standards."

For more information on the COE, go to **http://ciog6.army.mil**.

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FOG, FRICTION, and TECHNOLOGY

Improving the acquisition process for emerging networked command and control/situational awareness technologies

by MAJ Shane Robb

SITUATIONAL AWARENESS

A Soldier uses Force XXI Battle Command Brigade and Below (FBCB2) to track friendly forces, exchange messages, and navigate the battlefield, empowering subordinate leaders on the ground to take the initiative and accomplish the commander's intent. The Army is making progress in mitigating the "fog and friction" of the acquisition process to deliver these and other cutting-edge capabilities. (U.S. Army photo.)

HISTORY IS FULL OF EXAMPLES OF HOW THE CAREFUL FUSION OF EMERGING TECHNOLOGIES WITH IMPROVED DOCTRINE HAS MITIGATED THE **FOG AND FRICTION OF WAR AND PROVIDED A MILITARY ADVANTAGE.**

The motion picture "Black Hawk Down" depicts a real-life scenario from October 1993 in Mogadishu, Somalia. Despite nearly perfect situational awareness at the U.S. command post, when a Black Hawk helicopter was shot down, the fog and friction of a high-intensity conflict began to take hold. The leaders in the command post could see in real time the locations of the downed aircraft, the converging armed mobs, and the friendly forces. But as they attempted to direct Soldiers to the downed helicopter, they could not relay the exact timing of the upcoming turn, causing the convoy to miss the turn and continue down the wrong road under heavy hostile fire.

Seeing no other option, the Soldiers in the convoy were forced to turn around and drive back through the heavy fire. With barricades being built, the enemy converging, and casualties mounting, the convoy returned to base. Other Soldiers on the ground struggled to get to the downed aircraft. They arrived, but not quickly enough and without sufficient force to effectively evacuate the aircrews before becoming isolated and taking heavy casualties.

Nearly 20 years after the conflict portrayed in "Black Hawk Down," it is easy to see how far we have come in developing networked, platform-level, digital, command and control/situational awareness (C2/SA) capabilities. If the vehicles in that conflict had been equipped with Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT), they would have seen their location on a satellite image background, as well as the locations of all other friendly forces, including the downed helicopter. As surveillance aircraft located enemy forces and barricades, icons and graphics could have been created to display their exact locations on all of the FBCB2 systems in the vehicles. With this information, the convoy commander could have used his own enhanced understanding of the situation to take the initiative and direct the convoy directly to the downed aircraft and back to base.

As it was, despite the SA at the higher echelons, the Soldiers on the ground were not empowered to take the initiative, resulting in confusion and casualties.

FOG AND FRICTION IN ACQUISITION

The fog and friction of war as described by Carl von Clausewitz, the Prussian soldier and German military theorist (1780-1831), is inherent to battle. Fog and friction also wreak havoc on those fighting to provide enhanced capabilities to the warfighter. U.S. forces can look for ways to mitigate their effects.

A recent report of the Defense Science Board Task Force on DOD Policies and Procedures for the Acquisition of Information Technology explains that "the deliberate process through which weapon systems and information technology [IT] are acquired does not match the speed at which new IT capabilities are being introduced in today's information age." In short, the Army is not fielding advanced IT capabilities as quickly as they become available to industry. This should worry those in the acquisition community, because the country or organization that can field advanced IT capabilities fastest could gain a significant military advantage.

From the Prussians leveraging early railroads in the Austro-Prussian War to the Germans equipping tanks with radios during World War II, history is full of examples of how the careful fusion of emerging technologies with improved doctrine has mitigated the fog and friction of war and provided a military advantage.

Recent lessons learned from the use of networked, platform-level digital C2/SA systems in training and combat have also demonstrated that their incorporation into U.S. forces and doctrine will provide a tremendous advantage. Both FBCB2 and the prototype Nett Warrior battle command system have been used in combat and have been widely praised for the capabilities they provide to Soldiers.

MAPPING LOCATIONS

FBCB2 enables Soldiers to see their location on a satellite image background, as well as the locations of all other friendly forces. (U.S. Army photo.)

Examples include more accurate and timely directing of indirect mortar fire; no need to orient oneself immediately after an air assault landing; the coordination of direct fires to avoid fratricide; and coordination through a digital common operational picture that reduces the need for verbal radio communications.

The net results were the ability to act much faster than the enemy and a greatly reduced risk of fratricide.

By fielding networked, platform-level, digital, C2/SA capabilities to U.S. forces, we will enhance SA and, hence, situational understanding at all echelons of command. In particular, subordinate leaders on the ground will be empowered as never before to take the initiative and accomplish the commander's intent. In the acquisition community, we have an

obligation to mitigate the fog and friction of the acquisition process in order to deliver these capabilities and maintain a military advantage over our adversaries.

OVERCOMING THE OBSTACLES

The struggle between the deliberate Army acquisition process and the urgent imperative to field emerging IT capabilities has been well-documented. The arguments are familiar: Security certification requires a painstakingly long wait; testing can be overly rigid, redundant, or poorly timed in the development cycle; contracts are not always designed to evolve with technological progress; and too often the choices are between an unproven up-and-comer and a costly tried-and-true vendor.

However, recently there has been significant progress in each of these areas as the

Army made the network its top modernization priority. The National Security Agency (NSA), which previously took 18 to 24 months to certify a device to handle secret-classified data, has created commercial solutions for classified leveraging common standards—such as Federal Information Processing and National Information Assurance Partnership—to securely protect the data on emerging devices while slicing almost a year off the certification time.

On the Army side, Project Director Communications Security (PD COMSEC) within Program Executive Office Command, Control, and Communications-Tactical (PEO C3T) has become a much-needed hub for system developers and integrators seeking encryption expertise. For example, many system engineers deem Type 1 encryption necessary on capabilities that

AS THE SINGLE INTERFACE BETWEEN THE ARMY AND NSA TO FIND THE BEST KEY MANAGEMENT AND CRYPTOGRAPHIC MATERIEL SOLUTIONS, PD COMSEC IS STREAMLINING THE SECURITY CERTIFICATION PROCESS WITHOUT JEOPARDIZING INFORMATION SECURITY.

require less than the top-secret protection it can provide. PD COMSEC can prevent a waste of time and resources by guiding these individuals to alternatives to Type 1 when lesser security levels are appropriate. As the single interface between the Army and NSA to find the best key management and cryptographic materiel solutions, PD COMSEC is streamlining the security certification process without jeopardizing information security.

The testing community is also finding ways to better keep pace with industry without compromising the Army's robust standards. The series of four Network Integration Evaluation (NIE) and Network Integration Rehearsal events, which began in June at Fort Bliss, TX, and White Sands Missile Range, NM, and will run through 2012, yield operational efficiencies by sharing costs and utilizing the same available brigade. Efficiencies will also be seen on the battlefield, where Soldiers across separate echelons will plan and execute the battle in a synchronized fashion using a Network Capability Set.

The new testing and equipping model allows the Army to evaluate programs of record and new ideas from industry more quickly, integrate them before fielding to units in combat, and make incremental improvements based upon feedback.

From an FBCB2 perspective, Soldier feedback from the limited user test for FBCB2 Joint Capabilities Release at the NIE will influence the design and capabilities of Joint Battle Command-Platform (JBC-P), the next-generation FBCB2/BFT technology for tactical aircraft, vehicles, and dismounted forces that will be fielded to the Army and the Marine Corps beginning in FY13.

MODULAR STRATEGY ACCELERATES DELIVERY

A more modular acquisition strategy can also accelerate delivery of these capabilities to the warfighter.

For example, in the past, FBCB2 used one main contractor that handled software development and subcontracted out for other requirements such as hardware. Trying to steer that one large contract became ponderous and inefficient, so PEO C3T's Project Manager (PM) FBCB2 changed the approach. The lead for software development was handed over to the Software Engineering Directorate within the U.S. Army Aviation and Missile Research, Development, and Engineering Center, and a number of smaller contracts were awarded for the various parts of FBCB2.

This strategy allows for a higher degree of control and flexibility for the PM office. Funding can be handled more effectively

as well. Most important, having the government set the standards and software framework ensures that regardless of who develops them, applications will be secure and interoperable with existing mission command systems so that information flows seamlessly across all echelons of the force. This approach for the JBC-P family of systems is aligned with the Assistant Secretary of the Army for Acquisition, Logistics, and Technology Common Operating Environment (COE) strategy. A modular acquisition strategy, coupled with a COE, facilitates more frequent contract competitions for hardware or other functionality by reducing reliance on the domain expertise of vendors. This is critical in enabling the Army to keep up with industry.

Just as the Army's brightest engineers have innovated networked, platform-level, digital C2/SA technologies to cut through the fog and friction of war as experienced in Mogadishu, it is our responsibility to get these capabilities into Soldiers' hands. With the network now central to our modernization goals, we are on the right path.

MAJ SHANE ROBB is the Assistant Product Manager for JBC-P. He holds a B.A. in political science from Brigham Young University and an M.B.A. from Webster University.

GAME CHANGER

Nett Warrior provides cutting-edge technologies for situational awareness and communications

by MAJ Douglas W. Copeland

E merging technologies are key to ensuring that the Army constantly adapts to remain a well-equipped force that is second to none. This is one of the overriding principles in the Army's development of Soldier-worn situational awareness (SA) and communications solutions. Yet it is not the only principle at work.

Members of Product Manager Ground Soldier (PM GS) conducted a demonstration in April to present future initiatives in technology to the Program Executive Officer (PEO) Soldier and other Army leaders.

The demonstration featured several network, hardware, and software solutions identified by PM GS during extensive market research over a six-month period. The purpose of the event was to inform key stakeholders of what is in the "realm of the possible" for Soldier-worn SA and communication solutions. The demonstration showed how leveraging commercial technologies could reduce the size, weight, power, and cost of future Soldier systems, such as PM GS's Nett Warrior (NW).

NETT WARRIOR CAPABILITIES

NW is an integrated dismounted Soldier system in development that provides unparalleled SA, allowing faster and more accurate decisions in the tactical fight. NW is the

'TECHNOLOGY IS MOVING FORWARD'
LTC Roland Gaddy, PM GS, gives a program overview during the Nett Warrior Future Initiatives Demonstration April 5 at Fort Belvoir, VA. (U.S. Army photo courtesy of PEO Soldier.)

SMARTPHONE APPLICATION

Dr. David Darkow, with the Natick Soldier Research, Development, and Engineering Center, demonstrates Nett Warrior software on an Android smartphone operating system. (U.S. Army photo courtesy of PEO Soldier.)

platform that will be used as the foundation to address SA and command and control for the tactical small unit.

At the demonstration in April, PM GS detailed the constraints associated with pursuing commercial network, hardware, and software solutions and identified where waivers would be required and which agencies would need to provide waivers or allowances.

LTC Roland Gaddy, PM GS, kicked off the event.

"Technology is moving forward and changes are coming. We must continue to evolve; however, technology is not the issue," Gaddy said, referring to the availability of commercial hardware and software that can be used right now on the battlefield. "Statutes, policies, and processes are the challenge to providing game-changing technology."

Obtaining clearance or authorization to integrate these technologies into future NW initiatives will require relief from various categories of constraints at the U.S. Army Training and Doctrine Command, Army, and DOD levels, Gaddy said.

CUTTING-EDGE TECHNOLOGY

The technologies demonstrated included network solutions designed for various Soldier operating environments, to include man-portable ad hoc networks, encrypted commercial wireless networks, one-way and two-way Position Location Information Isolators, and Android operating system applications running the NW software on mobile devices.

"We are evaluating high-speed, cutting-edge technologies and stressing fightability," said Jason Regnier, Deputy PM NW. "Today's battlefield mandates extremely reliable technology to combat an agile and adaptive enemy. Just staying ahead isn't enough anymore; we are providing game-changing technologies to win the fight."

The demonstration also addressed materiel solutions for data transfer between unclassified and secret networks at the tactical level. Tactical demonstrations outside the Fort Belvoir [VA] Officers' Club allowed the participants to send and receive mission-essential data via their mobile devices and NW, to display screens visible inside the building.

The event is the first in a series of technology demonstrations planned by PEO Soldier to evaluate emerging technologies with warfighter applications that complement the NW program. The next event, the Joint User Interoperability Communications Exercise, was held at Fort Bliss, TX, in June. At the event, PM GS worked with the Signal Center of Excellence to demonstrate interoperability with tactical cellular capabilities.

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Another STEP CLOSER

WIN-T Increment 2 provides solutions to network challenges

by COL Chuck Hoppe and LTC Rob Collins

As the Army continues to bring new capabilities to bear on its warfighting mission, Warfighter Information Network-Tactical (WIN-T) Increment 2 will provide on-the-move (OTM), high-capacity satellite communications down to the company echelon for the first time, as well as an integrated high-capacity terrestrial and satellite communications network at the battalion level and above. The WIN-T program emerged four years ago from the Nunn/McCurdy process of controlling program costs as a new program—or, more accurately, four new programs.

The former Joint Network Node program was redesignated as Increment 1 with some changes. The Army has used Increment 1 for the past six years and is quickly nearing completion on fielding the 217 unit flags.

The "big bang" WIN-T program was divided up, creating three additional programs with incremental capability builds. One of these programs, WIN-T Increment 2, is the initial OTM capability and is soon to go to its first Army unit.

INCREMENTAL CAPABILITIES

Similar to a home Internet connection, WIN-T Increment 1, the current tactical backbone, provides high-speed, high-capacity voice, data, and video communications to units on the battlefield, at-the-halt (ATH), or at-the-quick-halt.

Unlike a home Internet connection, WIN-T Increment 2 provides this network to the formation while it is OTM. From an acquisition program perspective, WIN-T Increment 2 is post-Milestone C; the program is in low-rate initial production and is preparing for initial operational test and evaluation (IOT&E) in FY12.

The program office is using the remaining time before the IOT&E to complete developmental testing, characterize the network, assess safety release requirements, validate training materials, and evaluate logistics support processes before new equipment fielding and training. The program management and prime contractor team are setting conditions now so that when fielding begins in early 2012, program configuration items are producible in the quantities and timeframe needed and meet the reliability and maintainability requirements that ensure the equipment is dependable, complete, and capable of doing what is needed.

WIN-T INCREMENT 2

CW5 Leslie Cornwall (left) and MAJ Marcus Odum from the U.S. Army Training and Doctrine Command Capabilities Manager Networks and Services examine WIN-T equipment during a WIN-T Increment 2 Engineering Field Test at Fort Huachuca, AZ. (U.S. Army photo courtesy of Program Executive Office Command, Control, and Communications-Tactical (PEO C3T).)

EXTENDING THE NETWORK

The Soldier on the ground is the Army's greatest asset and is in many respects our most important sensor on the battlefield. Yet network users at echelons of company level and below have the greatest disadvantages.

There are myriad challenges in extending the network down to the lowest levels of the tactical formation. One of those challenges is to effectively provide satellite communications (SATCOM) down to these disconnected, geographically distributed lower echelons.

To help alleviate this particular issue, WIN-T Increment 2 introduces the Soldier Network Extension (SNE), which brings an initial SATCOM OTM capability to the company commander. The SNE's primary purpose is to provide a combat radio network extension to "heal" tactical radio nets using the larger WIN-T backbone.

A side benefit is that the company commander's vehicle becomes a lower-level node connected directly to the larger WIN-T backbone.

The SNE's combat radio network extension was specifically designed for lower-echelon radio nets, such as Soldier Radio Waveform, Enhanced Position Location Reporting System, and Single Channel Ground and Airborne Radio System. These can be broken into separate networks, or fractured, because of terrain features between formations that make line-of-sight communications impossible.

The SNE has the capability to heal that network over the SATCOM component of the WIN-T network. But, because it is a node in the WIN-T network, the company commander's vehicle now has limited network connectivity to the tactical backbone, both ATH and OTM.

FACILITATING OPERATIONS

Another challenge throughout the Army formation, and a major challenge for the S-6, is network operations (NetOps): the planning, administration, management, response, initialization, and spectrum and frequency allocation of the network.

WIN-T Increment 2 introduces the framework that begins to integrate the NetOps tools behind a single standard human computer interface, almost like a "digital dashboard." It also marks the beginning of policy-based network management of the tactical network.

The S-6 and G-6, based on the commander's intent and mission execution, now have the tools to manage spectrum very much like we currently manage and prioritize indirect fires. WIN-T Increment 2 also allows an unprecedented level of digital participation by the S-6 and G-6 in the military decision-making process.

Key to the planning and execution is the initial capability in the tools provided to plan the network and "weight the main effort."

As an example, if a battalion is the main effort, it can be allocated priority for message traffic by adjusting the quality of service (QoS) of the traffic in the network. If the battalion needs additional bandwidth, that, too, can be adjusted.

These policies can be pushed out to the WIN-T nodes remotely over the network. Once the agreed-upon policies are pushed out, the WIN-T Increment 2 network will automatically prioritize information according to precedence or category. Thus, mission-critical messages, such as 9-line medevac requests or calls for fire, receive higher priority. Vital information is delivered ahead of routine data.

This QoS, provided in part by a QoS edge device, is in addition to the standard QoS that is inherent in the current Internet Protocol Network.

TACTICAL COMMUNICATIONS NODE

Soldiers work with a Tactical Communications Node at the WIN-T Increment 2 limited user test at Fort Lewis, WA. (U.S. Army photo courtesy of PEO C3T.)

SUPPORTING INTEROPERABILITY

Another particularly challenging problem today is joint and coalition interoperability. Interoperability within our systems and with joint and coalition forces is key to a successful network and is paramount to any successful mission within the constantly changing and evolving operational environment, as evidenced by the current fight.

The WIN-T Increment 2 architecture was designed to help combat part of this problem.

One specific configuration item, the Joint Gateway Node (JGN), enables legacy equipment, as well as joint and coalition partners, to plug into the network. The JGN is not just the perimeter information assurance protection boundary at the division layer and below. It is the plug-in point for joint and coalition forces, as well as organizations that are not organic to the Brigade Combat Team (BCT) or division

headquarters network and do not have a standard connection in the network

The JGN does not solve the joint and coalition interoperability problem completely, but it does provide a mechanism to allow that joint or coalition partner to plug in to the WIN-T network, and it is modular to allow lower-echelon Army units to serve in joint and coalition mission capacities.

CHALLENGES OF INTEGRATION

A unique characteristic of WIN-T is that for the Point of Presence and SNE, the kit must be integrated into the Modified Table of Organization and Equipment vehicle of that particular unit.

Integration into the Bradley family of vehicles, Stryker platforms, Mine Resistant Ambush Protected vehicles, and current and future wheeled vehicles is a joint engineering endeavor involving the WIN-T program office and the program

offices for the associated vehicle platforms. Together, we are developing integration kits for numerous platforms across infantry, heavy, and Stryker BCT vehicle types.

Integrating these capabilities onto platforms is not without its engineering challenges, including size, weight, power, cooling, and claim space.

It is also essential to make certain that all of the electronics and transmission systems to be placed on a vehicle can coexist and function without interference to existing weapon systems, while ensuring the safety of operators and maintainers. This is a team effort across multiple program managers and our industry partners.

CONCLUSION

There is, of course, a lot more to the WIN-T Increment 2 program. The cited examples are only a few of the configuration items and capabilities that will be made available to Army units starting in early 2012.

The current WIN-T Increment 1 network is the backbone of today's tactical Army, soon to have its first OTM enhancement as WIN-T Increment 2 rolls off the production line.

WIN-T Increment 2 is no longer just a plan in PowerPoint. It's real!

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HMS MANPACK

A paratrooper from 3rd Brigade Combat Team, 82nd Airborne Division communicates using the JTRS Handheld, Manpack, Small Form Fit (HMS) Manpack Radio during a recent field exercise at Fort Bragg, NC. The Manpack's limited user testing, to include Soldier Radio Waveform, was part of the Network Integration Exercise at Fort Bliss, TX, and White Sands Missile Range, NM. (Photo by Ashley Blumenfeld, JPEO JTRS.)

WAVEFORMS

An integral part of building the Army network

by LtCol Brian Barton, USMC (Ret.)

Joint Program Executive Office Joint Tactical Radio System (JPEO JTRS)
is playing a key role in the Army's Network Integration Evaluation (NIE)
this summer, providing the terrestrial network backbone.

> **" THE WAVEFORMS ARE DESIGNED TO FIND THE BEST PATH** FOR DELIVERING A PARTICULAR MESSAGE, MAINTAINING A CONTINUALLY UP-TO-DATE UNDERSTANDING OF NETWORK-NODE LOCATIONS SO THEY CAN ALWAYS DETERMINE **THE BEST PATH. "**

The JTRS Handheld, Manpack, Small Form Fit (HMS) program's Manpack element is undergoing its limited user test, to include JTRS Network Enterprise Domain's (NED's) Soldier Radio Waveform (SRW) during the exercise. JTRS' HMS Rifleman Radio, Ground Mobile Radio, and NED waveforms are all vital components of the integrated testing conducted during the NIE.

The testing is designed to demonstrate how various systems, both programs of record and non-programs of record, fit into the Army's tactical network and connect Soldiers at all levels. The JTRS NED SRW and Wideband Networking Waveform (WNW) provide the backbone of terrestrial connectivity for many of the systems being used during the final two weeks of the integration exercise. While SRW is targeted for the individual Soldier and individual small units, WNW provides the backbone network connectivity between ground and air vehicles.

DIVERSE MISSIONS AND TERRAIN

These waveforms are operating under diverse mission scenarios that require mobile ad hoc connectivity over variable desert and mountainous terrain.

"SRW and WNW work very well in providing connectivity for dispersed forces," said Navy CAPT Jeffrey Hoyle, JTRS NED Program Manager. "Both WNW and SRW are designed to be mobile ad hoc in nature, in that they don't require a lot of preplanning for nodes to join and leave the network."

NIE will demonstrate the ability of WNW and SRW to move voice, video, data, and images faster, farther, and more efficiently than legacy waveforms across the battlefield through ad hoc mobile networking.

HMS RIFLEMAN

A Soldier wears the JTRS HMS Rifleman Radio during a Rifleman Radio event at the Military Operations in Urban Terrain McKenna site, U.S. Army Maneuver Center of Excellence, Fort Benning, GA, Feb. 3. (Photo by Vince Little.)

WIDEBAND WAVEFORMS
Soldiers carry handheld radios that can demonstrate the ability of wideband waveforms to move voice information farther and more efficiently than legacy waveforms across the battlefield through ad hoc mobile networking. (Photo courtesy of Program Manager JTRS Network Enterprise Domain.)

Both SRW and WNW, which can draw from a larger portion of the available spectrum, to transmit and have the ability to seamlessly route and retransmit information, Hoyle explained.

"The thing that is most important for throughput is the bandwidth that is available in the spectrum. The spectrum is a very finite resource, and the amount of bandwidth that is available will directly correlate to the amount of throughput that the network can support," Hoyle said.

SRW is designed to efficiently use spectrum in 1.2-megahertz bandwidth allotments, he said.

WNW can also support 1.2-megahertz allotments, but it operates more efficiently and effectively at 3- or 5-megahertz bandwidth allotments (up to 30 megahertz when available) to deliver even higher network capacity, he added.

"The waveforms are designed to find the best path for delivering a particular message, maintaining a continually up-to-date understanding of network-node

locations so they can always determine the best path," Hoyle said. "The power of the network is enhanced by increasing the number of nodes on the network."

SRW is targeted for the individual Soldier and individual small units and sensors, such as the Small Unmanned Ground Vehicle.

"SRW is focused on delivering a network capability to those users that have tight size, weight, and power requirements. It packs a lot of networking into a very small package and allows that to be integrated into handheld radios, small hockey-puck-sized radios, and very small sensors, such as unattended ground or air vehicles," Hoyle said.

WNW is intended primarily to provide the backbone network connectivity between ground and air vehicles, he said.

"It provides a lot of throughput capacity and has a lot of features and algorithms built into it because you have the size, weight, and power infrastructure of the vehicles," Hoyle said.

INTEGRATING CAPABILITIES FOR STRONGER NETWORK
JTRS NED also faces a new challenge during the NIE: WNW will be integrating with the satellite communications backbone Warfighter Information Network-Tactical for the first time.

The JPEO JTRS program has been a pioneer since its restructuring and stand up in 2005. Building the Armed Forces' first software-defined radio forged new ground, addressing the technological questions of how to build and deploy these radios, as well as hardware and software integration and testing. The program is now on the cusp of delivering capabilities that will revolutionize the way the warfighter operates.

LtCol BRIAN BARTON, USMC (Ret.), provides contractor test and evaluation support for the NED Program within JPEO JTRS through SRA International Inc. He holds a B.A. in sociology from Framingham State College and is a graduate of the Marine Corps Advanced Communications Officer Course and the Marine Corps Command and Staff College.

INFORMATION ON THE FLY

Smartphones combine with tactical radios to boost ground troops

by LTC Mark Daniels and LTC Mark Stiner

Paratroopers from the 82nd Airborne Division recently tested a cutting-edge combination of smartphones plugged into tactical radios during a field exercise as GEN Peter W. Chiarelli, Vice Chief of Staff of the Army, looked on. These Soldiers were able to communicate via voice, data, and images so they could swarm a mock village to capture a high-value target. Information traveled rapidly up and down the chain of command and horizontally between team and squad leaders.

The 82nd Airborne Division is an expeditionary force and prepares for full-spectrum operations around the globe. So Soldiers need a communications solution they can carry with them on the fly. Where they go without vehicles, they need something with voice capability. The smartphone test took that capability to the next level by adding data capability, making it more effective for the company and below. In the past,

squad leaders would yell instructions through the woods. This technology makes it possible for them to be faster, quieter, and, therefore, less detectable—all of which can save lives.

A JOINT ENDEAVOR

The Joint Program Executive Office Joint Tactical Radio System (JPEO JTRS) and Program Executive Office Command, Control, and Communications-Tactical (PEO C3T) joined

SMARTPHONES IN THE FIELD
Paratroopers from 3rd Brigade Combat Team, 82nd Airborne Division use radios and smartphones to communicate during a field exercise at Fort Bragg, NC, in March. (Photo by Ashley Blumenfeld, JPEO JTRS.)

forces to develop this solution. For the exercise, JTRS Handheld, Manpack, and Small Form Fit (HMS) Rifleman and Manpack radios were married with PEO C3T prototype handhelds, demonstrating interoperability between programs of record in the "transport layer" and the "application layer." The ruggedized, Android-based smartphones ran two apps: Joint Battle Command-Platform, or JBC-P Handheld, and Tactical Ground Reporting, known as TIGR Mobile.

JBC-P is the follow-on program for Force XXI Battle Command Brigade and Below. JBC-P displayed blue icons indicating the real-time Global Positioning System locations of friendly forces across a map of the battlefield, where users could also plot enemies or landscape hazards to alert their teammates.

Soldiers can easily become split. Rather than communicating via radio back to the truck to see where another squad is and where it is moving to, this capability allows Soldiers to view these details using a phone.

TIGR enabled the users to exchange photos and to enter and retrieve historical information relevant to the operation. One example of the many benefits of this capability is that a Soldier can now take a picture of his or her wound and send it to a doctor so that medics can make sure that treatment is appropriate for that exact wound. Another major benefit of using a technology that Soldiers are already used to—a phone—is that they can achieve all of these capabilities with very little training.

INFORMATION EXCHANGE
During the exercise, paratroopers from 3rd Brigade Combat Team, 82nd Airborne Division were able to communicate via voice, data, and images. (Photo by Ashley Blumenfeld, JPEO JTRS.)

PROTOTYPE
GEN Peter W. Chiarelli, Vice Chief of Staff of the Army, holds a prototype handheld with applications to track friendly forces and exchange photos. (U.S. Army photo.)

At the dismounted Soldier level, the HMS Manpack and Rifleman radios conveyed information using the new wideband networking waveform, Soldier Radio Waveform (SRW). SRW supports lightweight radios with Internet protocol capabilities for voice, data, and video transport. During the exercise, it provided situational awareness for troops as they parachuted in. As they accomplished the mission, they were able to leverage the connectivity back to their support aircraft. For those Soldiers who had simulated casualties, troops were able to share the information and photos of the casualties with the medical evacuation units.

The radios were integrated with Warfighter Information Network-Tactical (WIN-T) Increment 1 to carry the information between the ground troops and the battalion tactical operations center. A WIN-T satellite terminal known as Secure Internet Protocol Router/Non-secure Internet Protocol Router Access Point extended the network's range beyond line of sight and back up to high headquarters.

All of these capabilities highlighted the cooperation across different organizations and the integration of system components to optimize performance. Instead of developing many individual systems that work their best, it is important to tie all of them together to provide truly optimal capabilities for the Soldier.

NEXT STEPS
This exercise provided valuable, honest feedback that would be used to reduce risk for upcoming tests of the equipment, such as the Network Integration Evaluation in June and July. It is vital to take a disciplined approach to developing the software, creating a common framework that will ensure that everyone is on the same page about what messages are sent, how the computing resources on the smartphone are used, and the security involved in protecting the data.

PEO C3T will continue to partner with providers of various transport methods, including Netted Iridium and several radio models selected by the U.S. Marine

Corps for the production of JBC-P handhelds. In each instance, the mobile applications will be interoperable with existing battle command systems because they are built from a government-owned framework known as the Battle Command Product Line Mobile.

On May 18, the JTRS HMS Program successfully achieved Milestone C, a critical acquisition milestone and an important benchmark in delivering advanced networking capabilities to the warfighter. This decision authorizes the Army to first procure a low-rate initial production lot of up to 6,250 Rifleman radios and up to 100 Manpack radios. The milestone also marks an important step for the core capability JTRS will provide to the individual warfighter. The increased situational awareness created by the HMS radios will give warfighters more information to outmatch enemies and ensure more successful operations.

While challenges remain, the Fort Bragg exercise was a step toward leveraging smartphones for tactical use. It is clear that providing communication capabilities to dismounted Soldiers increases their survivability, lethality, and effectiveness.

LTC MARK DANIELS is the Product Manager for JBC-P. He holds a B.S. in operations research from the U.S. Military Academy and an M.S. in industrial engineering from Pennsylvania State University. Daniels is Level III certified in program management and is a U.S. Army Acquisition Corps (AAC) member.

LTC MARK STINER is the Product Manager for the JTRS HMS program. He holds a B.S. in Economics from the University of Tennessee and an M.B.A from the Naval Postgraduate School. He is an AAC member.

Army Accelerates
App Innovation and Delivery

The Army is developing the next Apps for the Army (A4A) challenge, expanding participation to include public and industry developers. The next A4A is expected to launch in 2012.

"In 2010, the Apps for the Army challenge provided a venue for internal Army early adopters and innovators," said Gary Blohm, the Army Chief Information Officer (CIO)/G-6's lead for Army Software Transformation. "This time, the Army wants to tap into industry, and not just for its well-known app development capabilities, but to help them look at new ways to broaden third-party participation in the marketplace."

For the next A4A, the CIO/G-6 is designing prototype monetization business models (how web traffic is converted into sales) and addressing intellectual property rights, Blohm said.

Army CIO/G-6 efforts to accelerate innovation and delivery of applications include a number of events to engage industry in changing the business models, practices, and processes currently used to respond to warfighter needs. The events will help refine the existing prototype Army Application Marketplace and its capabilities, and will provide the foundation for next year's A4A challenge.

"Our ability to adopt more agile practices and processes is based on the ongoing collapse and standardization of computing environments," said Blohm. "This means we are looking to establish an online

ARMY APP FOR SMARTPHONE
Soldiers and others can now read the latest Army news on their iPhones, thanks to a new application created by the team that developed the Army's website, www.Army.mil. (U.S. Army photo)

capability that can support applications that are accessed by a variety of devices across diverse mission areas."

While many think of apps and app marketplaces as being only for smartphones, the Army wants to use the marketplace for all types of apps.

The Army launched A4A in 2010 to unleash the creativity of Soldiers and Army civilians to develop solutions that would enhance operational effectiveness and increase business productivity. Parallel efforts were undertaken to establish a supporting proof-of-concept application

marketplace with streamlined processes and capabilities provided by DOD, such as the DOD Storefront; Forge.mil, a family of services led by the Defense Information Systems Agency that was created to support DOD's technology development efforts; and Rapid Access Computing Environment, or RACE; a marketplace of capabilities supported the distribution of the A4A winning apps.

For more information on the A4A, visit **http://ciog6.army.mil/Apps4Army2010/tabid/67/Default.aspx.**

—From CIO/G-6 and staff reports

Army Migrates to Enterprise Email

The Army's network email is in the midst of migrating to Enterprise Email, an improved system enabling users to have military email access worldwide.

The new system also allows users to retain their email accounts if transferred to a different agency or organization within DOD. If users switched organizations under the previous system, their email addresses would change to reflect that.

"Right now the global address list is small for individual users, and for the Army there is no visibility on other services' addresses. Upon migration to Enterprise, 3.9 million addresses will appear in the [global address book] immediately," said Mike Krieger, Army Deputy Chief Information Officer (CIO)/G-6.

"This will also allow us to share calendars with outside entities, and this migration will allow us to have unlimited storage."

The new email is provided by the Defense Information Systems Agency (DISA). The migration to DISA is part of a larger DOD effort to consolidate information technology services, improve capabilities, and reduce overall costs.

A PHASED APPROACH

The migration covers 1.4 million unclassified network users and 200,000 secret network users.

The first phase in April migrated more than 14,000 Army users, including those at the Army CIO/G-6; U.S. Army Network

Enterprise Technology Command/9th Signal Command (Army); 7th Signal Command; U.S. Army Research, Development, and Engineering Command; 93rd Signal Brigade; Fort Riley, KS; Fort Monmouth, NJ; Rock Island, IL; and Aberdeen Proving Ground, MD.

The first major, multi-installation migrations began in June; as of July 18, 87,000 users had migrated.

By the end of December, Army user migration will be complete, in addition to migration of DOD personnel assigned to Army-hosted combatant commands.

DISA'S ENTERPRISE EMAIL
A Soldier at her workstation will be able to share calendars with users outside of the email program after migrating to DISA's Enterprise Email. (U.S. Army photo by CIO/G-6).

The Army also is looking to move its SharePoint collaboration systems, which currently operate on servers around the world, to the DISA cloud, Krieger said.

"We think it's the same business case," he said. "The software's paid for, but there are too many people standing up their own SharePoint portals. So what you're paying for is extra servers and extra people running them."

COST SAVINGS

While an undertaking of this magnitude does not come without challenges, the project's cost savings make it worthwhile, officials said. They believe the migration will generate annual savings exceeding $100 million in years to come, with efficiencies produced as early as FY12.

This year's cost for the project is $52 million, with the estimated annual cost per user at $39.

"The bill to the Army will go down every year," said Krieger.

"We are hitting our budget targets. We are on budget for [migrating] NIPR [Non-Secure Internet Protocol Router], and we're on track to do the same for SIPR [Secure Internet Protocol Router]," said Air Force Maj Gen Ronnie Hawkins, Vice Director of DISA, referring to the military's non-classified and classified networks.

—From CIO/G-6 and staff reports
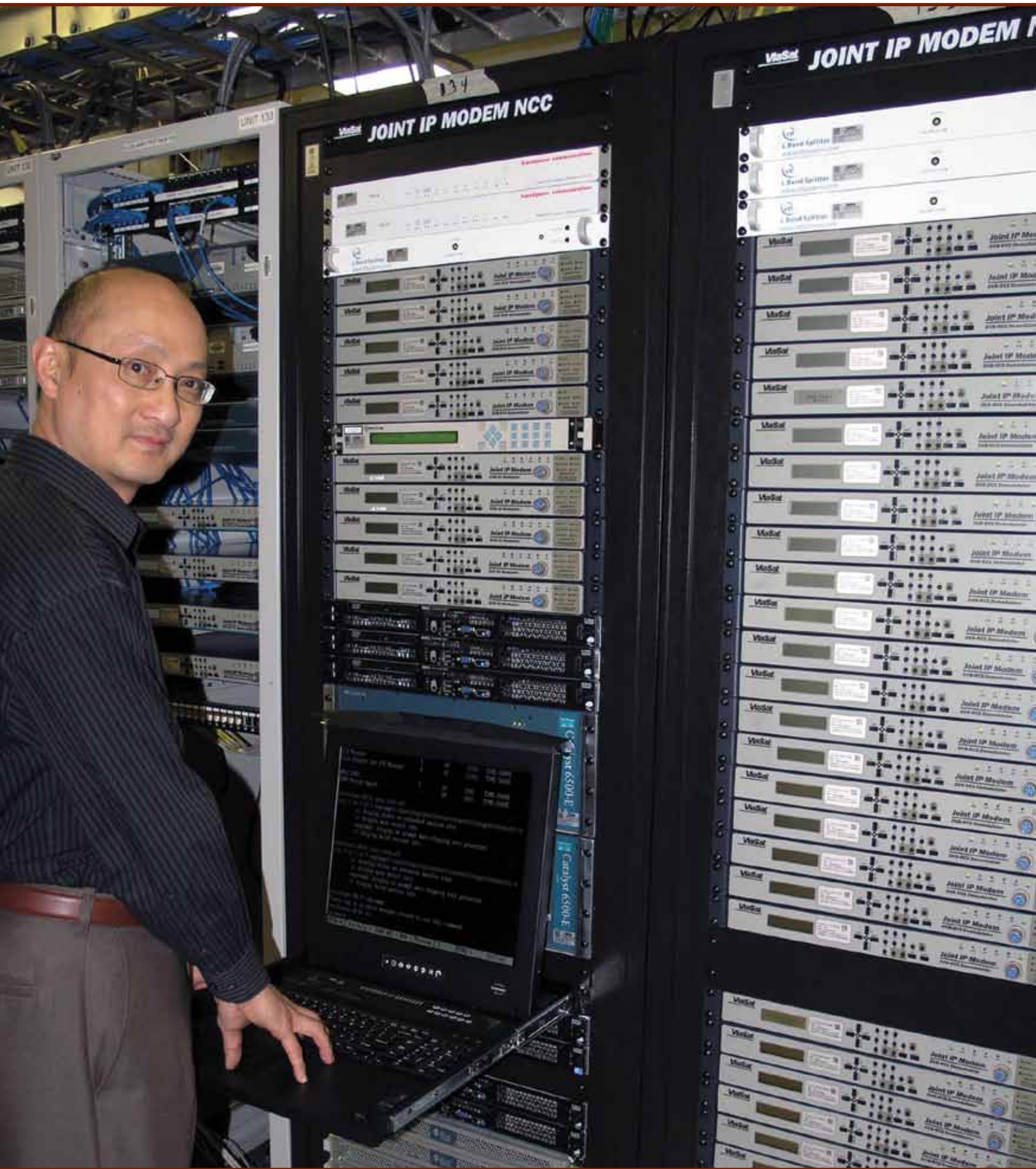
BANDWIDTH ON DEMAND

DOD's Joint IP Modem
provides efficient standard solution

by Johnny Ng

The requirements of net-centric warfare and operations for robust networks, information sharing, and collaboration have led the U.S. military increasingly to use Internet Protocol (IP)-based products over both government and commercial satellites.

To date, U.S. military satellite communications (SATCOM) systems using IP include the Army's Joint Network Node, Warfighter Information Network-Tactical, and Combat Service Support SATCOM; the U.S. Marine Corps' Support Wide Area Network; the U.S. Air Force's Global Broadcast Service; and the Navy's Commercial Broadband Satellite Program.

However, these and other similar systems all use different proprietary modems. According to officials at the Defense Information Systems Agency (DISA),

there are many different modems in the DOD inventory, each requiring its own logistics support. The proliferation of nonstandard modems also presents issues regarding interoperability, efficient use of bandwidth, and transmission security (TRANSEC).

As the new standard, the Joint IP Modem (JIPM) can support direct interoperability throughout these systems. The JIPM is based on the widely adopted Digital Video Broadcasting-Satellite 2nd Generation and Digital Video Broadcast-Return Channel Satellite standards.

JIPM is managed by DISA's JIPM Program Office. The Defense Communications and Army Transmission Systems (DCATS) Project Office, part of Program Executive Office Enterprise Information Systems, serves as the acquisition agent. JIPM underwent qualification testing in December at the Joint SATCOM Engineering Center at Fort Monmouth, NJ.

JIPM PASSES TESTING

Testers using JIPM successfully passed network traffic via Defense Satellite Communications System and Wideband Global SATCOM military satellites and

NETWORK CONTROL CENTER
The author, Product Leader for Modems in the DCATS Project Office, checks out the JIPM Network Control Center during recent qualification testing at the Joint SATCOM Engineering Center at Fort Monmouth, NJ. (U.S. Army photo by Stephen Larsen.)

> " JIPM WORKS IN A HUB-SPOKE CONFIGURATION, SIMILAR TO DIRECTV. WITH JIPM, ONE SIGNAL GOES UP FROM THE HUB TO THE SATELLITE AND SPREADS TO MANY OTHER REMOTE MODEMS [THE SPOKES] AROUND THE WORLD. "

a Telstar 14 commercial satellite in the X, Ka, and Ku bands. The JIPM Network Control Center, a two-rack hub, successfully broadcast and received traffic from multiple remote modems, each of which is housed in a 1U-size (1.719-inch or 43.7-millimeter) chassis.

"JIPM works in a hub-spoke configuration, similar to DIRECTV," said Art Reiff, a SATCOM consultant with DCATS. "With JIPM, one signal goes up from the hub to the satellite and spreads to many other remote modems [the spokes] around the world."

Testers demonstrated both unicast (host-to-host) and multicast (one host to a specific set of hosts) operations, using 11.58-meter AN/GSC-39 terminals and 2.4-meter tactical Very Small Aperture Terminals to transmit at X-band; the nine-meter Ka Satellite Transmit and Receive Systems AN/GSC-70 terminal to transmit at Ka-band; and a satellite simulator to transmit at C-band.

Reiff said that JIPM uses satellite bandwidth much more efficiently than prior types of modems.

It is unique among modems in that it employs internal TRANSEC that has been certified to comply with the *National Institute of Standards and*

Technology Federal Information Processing Standard 140-2.

FIRST DELIVERIES

DCATS is acquiring JIPM via an $87 million delivery order awarded in October 2007 on the World Wide Satellite Systems Indefinite Delivery/Indefinite Quantity contract from prime contractor Globecomm Systems Inc., with ViaSat Inc. serving as the major subcontractor.

The first deliveries of JIPM Network Control Centers were in January to various DOD Teleport and Standardized Tactical Entry Point sites. The first deliveries of remote modems were in April to Hanscom Air Force Base, MA, followed by deliveries in June and July to the Navy in Charleston, SC, and Norfolk, VA.

The version of JIPM that just completed qualification testing could be just the first stage of an evolving standard IP infrastructure that will keep growing to serve future warfighter needs.

Christopher Catlin, JIPM Program Manager in DISA's JIPM Program Office, said his staff is working to identify a second-source vendor for JIPM to ensure multiple providers. "We released an RFI [Request for Information] in October for industry to review the JIPM Interoperability Draft," said Catlin, adding that

many vendors responded with excellent comments and even provided recommendations that could improve JIPM's utility as an open-standard device.

Catlin said that in addition to delivering JIPM to meet current needs, DISA is looking toward future IP modems that meet visions defined by DOD.

"We want to 'right-size' IP modems that will logically play into a defined technology road map for DOD," he said.

He added that the JIPM Program Office has been working with the user community to identify the next wave of JIPM enhancements, such as dynamic routing, improved encapsulation, mesh network architectures, and communications on the move, as well as remote modem packaging options that will accommodate smaller size and less weight and will provide power for ground, shipboard, and airborne platforms.

JOHNNY NG is the Product Leader for Modems in the DCATS Project Office, as matrix support from the U.S. Army Communications-Electronics Research, Development, and Engineering Center. He holds a B.E. from the City College of New York and is certified Level III in program management and Level II in systems engineering.

SPACE to
GROW

New Satellite Communications Operations Center maximizes capabilities of Wideband Global SATCOM Satellites

by Derald Franklin

The new Wideband Satellite Communications (SATCOM) Operations Center (WSOC) at Joint Base Pearl Harbor-Hickam, Wahiawa, HI, is the first of a new generation of satellite control facilities, with much-needed space for expanding missions and the modern wideband control systems required to fully use the expanded capacity of the military's new Wideband Global SATCOM (WGS) satellites.

"We replaced the 1980s-era satellite control capability that we had at Camp Roberts, CA, with this state-of-the-art $25.3 million facility here at Wahiawa," said LTG Richard P. Formica, Commanding General, U.S. Army Space and Missile Defense Command/Army Forces Strategic Command (USASMDC/ARSTRAT). The team at Wahiawa will manage the satellite payloads and "provide critical communications, navigation, and other space-based capabilities to our warfighters," Formica said.

"Inside this center, and within the WSOCs around the world, dedicated Soldiers, civilians, and contractors will coordinate and control the vast majority—in fact, virtually all—of the military's wideband SATCOM capacity that is used to support U.S. combat forces in Iraq and Afghanistan, our fleet forces afloat, and

WGS IN ORBIT

The new WSOC has visibility to more Pacific region satellites, including the military's new WGS satellites, one of which is shown here. "This enables the best support and coverage for PACOM [U.S. Pacific Command] theater wideband satellite communications requirements," said LTG Richard P. Formica, Commanding General, USASMDC/ARSTRAT, who added that the Wahiawa WSOC is the designated test facility for payload control validation for future WGS launches. (Illustration by Mark Wall.)

MANAGING SATELLITE OPERATIONS
A Soldier of the 53rd Signal Battalion works on the operations floor in the newly dedicated Wideband Satellite Operations facility in Wahiawa, HI. (U.S. Army photo by D.J. Montoya, 1st Space Brigade Public Affairs.)

Soldiers, Sailors, Airmen, and Marines stationed around the world who work daily to defend our great Nation," he said.

SATELLITE CAPABILITIES
Each WGS satellite has a throughput of approximately 4.75 gigahertz of bandwidth, equating to 2.1 to 2.5 gigabits per second of communications. That's about 10 times the bandwidth capacity of a Defense Satellite Communications System (DSCS) satellite, enough capacity to transmit approximately 3 million web pages per second, 400 Predator video feeds per second, or 0.5 high-resolution CT (computed tomography) medical scans per second.

"A single WGS satellite equals the bandwidth capacity of the entire 10-satellite DSCS constellation," said Dan Hannan, USASMDC/ARSTRAT Senior Technical Manager. "We'll be able to support many, many more warfighter missions with WGS compared to DSCS."

SSG Michael Clifton agreed. Clifton is a 25S SATCOM Systems Operator/Maintainer with Delta Company, 53rd Signal Battalion, 1st Space Brigade, which staffs and operates the WSOC 24-7. With the combination of WGS satellites and the new wideband control systems, "If warfighters call up with issues, our operators can pull things up and respond a lot faster," he said.

COL Jeffrey Mockensturm, Project Manager Defense Communications and Army Transmissions Systems (DCATS) in Program Executive Office Enterprise Information Systems (PEO EIS), said that controlling WGS satellites, compared with legacy DSCS satellites, is "a

geometric leap in terms of complexity of the mission for these satellite controllers." For one thing, DSCS satellites transmit in only X-band, while WGS satellites transmit in both X-band and Ka-band, but the difference is more than that, Mockensturm said.

"The WGS satellite is so much more complex," he said. "WGS is not just a bigger pipe, but more pipes and the ability to switch between pipes on the bird, coming up on one frequency and going down on another. In the case of Ka band, we have dual simultaneous polarity, making two channels from one."

"Thanks to WGS, ground forces who are using an X-band terminal or radio have the capability to communicate with other forces who are using a Ka-band terminal or radio," said Michael McGarvey,

DCATS' Product Director Wideband Control. "That means warfighters on a battlefield won't have to wait in a queue for channels to open up."

"That's called 'cross-banding,'" added David Morrissey, DCATS' Acting Deputy Product Director Wideband Control. "It provides the warfighter faster, readier access and is a big deal in places that don't have land-line infrastructure, such as Afghanistan."

MANY PIECES, PLAYERS

The Naval Facilities Engineering Command Hawaii oversaw the construction of the Wahiawa WSOC, with USASMDC/ARSTRAT tasking three project management offices of PEO EIS to provide the operating equipment and systems.

PEO EIS' DCATS Satellite Communication Systems (SCS) product office installed a satellite terminal that had been refurbished at Tobyhanna Army Depot, PA, as the auxiliary satellite control terminal at Wahiawa while the Camp Roberts WSOC remained operational. "That way there was no loss in satellite coverage of the Pacific while we were installing the terminal at Wahiawa," said Dwayne Cartagena, DCATS' SCS Product Leader.

The SCS product office provided an AN/GSC-52 satellite terminal to serve as the WSOC's auxiliary satellite control terminal, supplied baseband equipment, and linked the WSOC's Interconnect Facility to three nearby AN/FSC-78 satellite terminals and two nearby Ka-Stars (Ka-band Satellite Transmit and Receive System) satellite terminals.

PEO EIS' DCATS Wideband Control product office provided the wideband control systems at the Wahiawa WSOC. These systems included a patch and

> " **WGS IS NOT JUST A BIGGER PIPE, BUT MORE PIPES** AND THE ABILITY TO SWITCH BETWEEN PIPES ON THE BIRD, COMING UP ON ONE FREQUENCY AND GOING DOWN ON ANOTHER. "

test facility; Common Network Planning Software (CNPS), which allows planning of links for maximum WGS satellite throughput; the Global Satellite Configuration Control Element, which sends payload commands to WGS satellites and gets telemetry information back; the Wideband Global Spectrum Monitoring Subsystem; the Replacement Frequency Modulated Orderwire, which provides a secure interface between the WSOC and tactical satellite terminals; the Replacement Radio Frequency Interface Subsystem, which does frequency conversion between the WSOC and satellite terminals; and the Wideband SATCOM Operations Management Subsystem, which provides a workstation allowing Soldier operators to access any wideband control system, whether it controls new WGS or DSCS satellites.

INSIDE THE WSOC

"CNPS has more integration with other systems and is more automated. Everything's tied together; we don't have to do work-arounds," said Clifton.

Configuration Manager Bill Westgate, who designed the layout and supervised the installation of wideband control equipment racks and workstations, said that "certain systems had to talk to other systems, both red [unencrypted] and

BUILT-IN BACKUP
Workers install a radome over the auxiliary satellite control terminal at the Wahiawa WSOC. (U.S. Army photo by Steve Wikoff.)
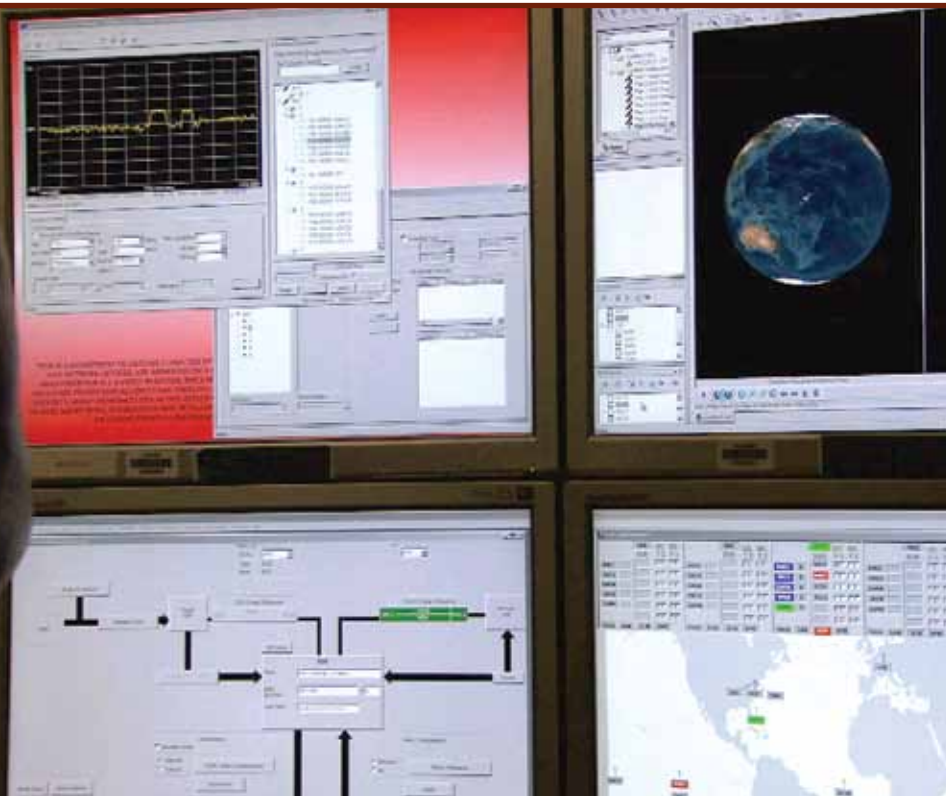
ACCESS POINTS
The new WSOC at Wahiawa, HI, hosts workstations, such as those shown here, allowing Soldier operators to access any Wideband Global SATCOM wideband control systems along with Defense Satellite Communications System legacy wideband control systems. (U.S. Army photo by Rob Lorkiewicz.)

black [encrypted], so I had to locate them to facilitate that."

The new 28,244 square-foot Wahiawa WSOC employs a standardized floor plan that allows sufficient space for satellite operations; equipment areas; offices; training, conference, fitness, and supply rooms; and even rooms set aside to support future missions. The facility is nearly three times the size of the 9,600-square-foot WSOC at Camp Roberts that it replaced.

"It's an orders-of-magnitude difference," said Steve Wikoff, USASMDC/ARSTRAT Operations Analyst at the Wahiawa WSOC. "The operations floor at Roberts was pretty cramped. We couldn't get any more equipment in there."

The biggest challenge for PEO EIS' Command Center Upgrades/Special Projects

Office (CCU/SPO) was in sequencing deliveries of equipment, furniture, and other materiel from multiple project managers. "As much as possible, we sequenced it so that materiel was shipped directly to the site and then staged in the proper area within the building, without having to be sent to a warehouse," said Ray Lorenzo, CCU/SPO Project Leader.

"It was a pretty compressed schedule to meet the IOC [initial operational capability] date of December 23," said Cartagena.

MODERNIZATION MODEL
Formica said that the layout of the Wahiawa WSOC will serve as a template for modernization of WSOCs at Forts Detrick and Meade, MD, and Landstuhl, Germany, over the next three years. Meanwhile, DCATS' Wideband

Control product leaders will continue to provide more capabilities, allowing operators to tap the increased potential of WGS satellites.

Morrissey said that, as funding permits over the next few years, DCATS' Wideband Control product office plans to provide additional wideband control systems, such as the Remote Monitoring and Control Element, which will allow remote control of WGS satellite payloads and remote spectrum monitoring of satellite terminals not co-located at the WSOC; the Power Control Management Subsystem, which will measure the quality of signal strength and automatically increase the power, as needed, when the signal is attenuated due to atmospheric conditions; the Joint Management and Operations Subsystem, which will provide situational awareness of Internet protocol over SATCOM for WGS; and the Wideband SATCOM Trend Analysis and Anomaly Resolution Subsystem, which will provide situational awareness of all networks over WGS.

"Our goal is to continue to provide USASMDC/ARSTRAT with the wideband control tools required to perform their payload configuration and control mission," said McGarvey.

"This is no small task, and our Soldiers and civilians take pride in their ability to maintain that lifeline that secure communications bring to those who are serving in harm's way," said Formica.

DERALD FRANKLIN is the Project Leader for Satellite Spectrum Monitoring Systems for the DCATS project office, as matrix support from the U.S. Army Communications-Electronics Research, Development, and Engineering Center. He holds a B.S. in computer science from Thomas Edison State College.

A Look Back, and Ahead

Former PEO takes stock of the Army network, efficiencies, and workforce development

by Margaret C. Roth

LEADING PEO EIS

Leanne Michaels from Product Manager Medical Communications for Combat Casualty Care (MC4), part of Program Executive Office Enterprise Information Systems (PEO EIS), explains the MC4 handheld device to former PEO Gary L. Winkler. The device is used by medics in the battlefield to access warfighters' medical records and to record injuries and resuscitative care for transmission to battlefield hospitals. (U.S. Army photo by Glenn Luther.)

Gary L. Winkler, an Army civilian for 23 years culminating in 3½ years as the leader of PEO EIS, saw dramatic changes in his career, and wished some other changes had been more dramatic than they were.

Winkler, who stepped down at the end of April to join the private sector, sat down with *Army AL&T* Magazine on April 27, in his last week as PEO, to share his perspectives on where the Army stands in today's computing environment and in the ongoing efforts to do more without more while building a robust Acquisition, Logistics, and Technology Workforce.

PEO EIS' mission is to design, develop, integrate, test, and field new network-based capabilities by leveraging commercial hardware and software solutions in finance, logistics, personnel, communications infrastructure, biometrics, medical, and warfighting functions.

PEO EIS typically is the "first in" to a theater of operations, to set up IT systems before troops arrive. Its portfolio is broad and diverse. Most of its large-scale systems support the generating force, although some of its systems, such as DOD Biometrics and Medical Communications for Combat Casualty Care, support the operating force.

Winkler has seen DOD budgets wax and wane, and grappled with how best to make programs more efficient while ensuring top-notch service to the warfighter.

AN IT TRANSFORMATION

"It's been amazing to be part of the Army and DOD transformation to a net-centric, knowledge-based force," Winkler said.

"Earlier in my career, there were only mainframes and punch cards, and then we moved into the PC and workstation environment. Then it was client-server applications, which only worked for local networks. Now we have global enterprise systems that are web-based, and most systems are accessible through 'the cloud.' Cloud computing is now in play as the next evolution of server consolidation."

Over the next three to five years, the Army and DOD will be challenged to get applications into secure cloud computing environments where they can function on smartphones and tablets, Winkler said.

"Without a doubt, network and information security will be the biggest challenge as we move to integrate commercial data centers, aka cloud environments, and commercial software-as-a-service into our operations and capabilities."

Software-as-a-service is a rapidly growing sector in private industry, taking business functions that can easily be treated as commodities—such as email, calendars, contacts, and tasks—and leveraging massive economies of scale to lower costs while meeting capability requirements. "There is not much risk in buying such capabilities this way," Winkler said, although there is risk with complex functions and capabilities, which are not appropriate for outsourcing to software-as-a-service vendors.

MANAGING RISK

"I had hoped to be able to move the Army forward a little faster in the mobile smartphone area," Winkler said in reviewing his tenure as PEO. "We have [security] solutions in place, but the processes to get those solutions approved are cumbersome and time-consuming, as always with anything new."

The Army and DOD are behind the curve in addressing security concerns with commercial technology, Winkler said. "It's not that there is necessarily a huge security risk or vulnerability with commercial technology, but rather we need to develop policies and processes to assess and manage risk."

"THERE ARE ALWAYS EFFICIENCIES TO BE GAINED WHEN PEOPLE ARE FORCED TO BE CREATIVE, AND I'M CONFIDENT THE PEO AND PMS WILL RISE TO THE CHALLENGE."

> **"WE WORK LEAN SIX SIGMA REALLY HARD. I TELL OUR PEOPLE IT'S NOT JUST ABOUT PROCESS IMPROVEMENT BUT ABOUT DEVELOPING THE WORKFORCE."**

There is no need to secure all data for everything, he said. "That's simply not necessary because some data is perishable and is worthless after a certain amount of time. Other data simply is not very sensitive." The Army and DOD are behind the private sector in the area of mobile smartphones, while security solutions are in the works. "It's a matter of [managing] risk vs. making it perfect. So we're just going to march along incrementally with the Android, the iPhone, and the iPad. But the genie's out of the bottle."

Industry and academia can help get new capabilities to market and into Soldiers' hands faster, Winkler said. A number of organizations exist to foster such public-private relationships, such as the Virginia Tech Applied Research Corp. and the nonprofit Security Innovation Network.

FINDING EFFICIENCIES

Efficiency initiatives serve to formalize the ongoing practice of delivering required capabilities on schedule with less money, as opposed to maximizing capability against available budgets, Winkler said. "The key is for program managers [PMs] to figure out which efficiencies make the most sense for a program at its particular phase in the life cycle."

Winkler is concerned that the Army, in its search for efficiencies, may impose new mandates that end up adding unnecessary complexity to acquisition processes, making them inefficient in the end. He noted that many PEOs are already following

business practices espoused in the guidance from Dr. Ashton B. Carter, Under Secretary of Defense for Acquisition, Technology, and Logistics, because they simply make sense.

PRESENTING VSAT
Winkler dedicates the 3,000th Very Small Aperture Terminal (VSAT) during ceremonies last fall. The VSAT provides warfighters connectivity in communications austere environments, such as remote camps, posts, and stations. (U.S. Army photo by William Hitchcock.)

The stopgap continuing resolutions under which DOD and the rest of the federal government were forced to operate until April 15, when FY11 funding was signed into law, in a sense were "a

good warm-up," Winkler said. "There are always efficiencies to be gained when people are forced to be creative, and I'm confident the PEO and PMs will rise to the challenge."

Winkler cited as one of PEO EIS' best practices its PEO Strategy Map, a balanced scorecard based on the Strategy Map of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology. Each of the PMs within PEO EIS in turn maintains its own Strategy Map to measure monthly against the PEO's. "It is all tied into the Army's Strategic Management System, viewable by everyone in the Army," Winkler said.

WORKFORCE DEVELOPMENT

Besides keeping programs and solutions moving forward to provide needed capability to Soldiers and civilians, Winkler is proudest of PEO EIS' success in developing the workforce and instituting processes to ensure that there is "no single point of failure," so that the organization can mature even while people come and go.

PEO EIS also established a Human Capital Strategic Plan to develop the next generation of leaders at the PEO and PM levels. Part of its strategy to build new and existing talent is to recruit college students to work part-time while they are finishing their degrees, then hire them full-time after they graduate.

The Human Capital Strategic Plan was an output of a Lean Six Sigma Black Belt (LSS BB) project. "We work Lean Six Sigma really hard. I tell our people it's not just about process improvement but about developing the workforce." LSS is how people learn how a process "thread" is knitted through an entire organization, Winkler said. "And so they learn more

$4 BILLION RESPONSIBILITY

As the leader of PEO EIS, Winkler was responsible for more than 2,600 military, civilian, and contractor personnel executing approximately $4 billion in programs, or the equivalent of 56 percent of the Army's FY10 information technology budget. (U.S. Army photo.)

about the organization, more about functional elements of the process."

Another BB project at PEO EIS is looking at program offices to determine the right mix of entry, mid-, and senior-level staff. "I think the tendency, with a hiring freeze or a pay freeze, is that organizations will get top-heavy. We want to avoid a situation like we have in the contracting world, where we have a big gap in the middle skills," Winkler said.

A key element of PEO EIS' workforce development strategy, he said, is to provide opportunities for internal mobility so that about 10 percent of the PEO EIS workforce each year can move into new assignments to broaden their skills and experience. "We're not afraid to lose some of our best people" if it helps them and the Army, he said.

As Winkler himself prepared to depart, he said, "I'm practicing what I've preached to our workforce. I will have been PEO here for four years in October, so it's time for me to move on."

Since moving to the private sector, Winkler has been consulting with industry to enhance understanding of government requirements and help build relationships. He is also standing up a government support systems engineering/technical assistance company that will tackle IT, cyber, and DOD challenges. He also planned to volunteer in the office of the Department of Veterans Affairs' Chief Information Officer.

"I want to continue providing value added to the government, and I feel the best place for me to do that is with private industry," Winkler said.

PEO EIS' programs "are in excellent shape," with "an exceptional team who will keep these programs moving forward," he said. "It's a great office, with a lot of talent."

Winkler's successor as PEO EIS has not been announced.

MARGARET C. ROTH is the Senior Editor of Army AL&T *Magazine. She holds a B.A. in Russian language and linguistics from the University of Virginia. Roth has more than a decade of experience in writing about the Army and more than two decades' experience in journalism and public relations.*

PEO AMMUNITION

PM
Combat
Ammunition
Systems

PD
Joint
Services

PM
Close
Combat
Systems

PD
Joint
Products

PM
Towed
Artillery
Systems

PM
Counter
Explosive
Hazard

PM
Maneuver
Amunition
Systems

VALUE ADDED

New aviation equipment and designs, combined with lower costs, provide better value for taxpayers and help bring troops home

by Kris Osborn

Recent technological advancements are allowing Army aviation to provide an increase in efficiency, as well as new capabilities for Soldiers. The work that the aviation community has done to drive down costs and achieve efficiencies "is exactly what we need to do, and we just need more work to obtain greater efficiencies across a broad spectrum of aviation industry," said LTG William N. Phillips, Principal Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASAALT).

Phillips, citing DOD's push to achieve or identify $100 billion in savings by FY16, noted Army aviation's creation of a "solid plan."

Multiyear contract approaches and other techniques for finding efficiencies have produced $450 million in savings for the CH-47F Chinook helicopter; $700 million (pending congressional approval) for the UH-60 Black Hawk; and $2.5 billion overall throughout aviation systems, Phillips said during the 2011 Army Aviation Association of America (AAAA) Annual Professional Forum and Exposition, April 17-20 in Nashville, TN.

"One of our challenges for now and the future is to make sure that we take advantage of every dollar that the American taxpayer and Congress give us," Phillips said.

HIGH OPERATIONAL TEMPO

Having flown more than 4.5 million hours since 2003, the Army aviation community has an operational tempo (OPTEMPO) five times that of peacetime.

According to Phillips, the Army has 623 manned and unmanned aircraft in theater today. It delivered more than 250 new aircraft and 317 new unmanned aerial systems to the field in 2010 while maintaining mission readiness rates of approximately 84 percent across the fleet.

In the face of this high OPTEMPO, Phillips emphasized the importance of aviation reset. Reset efforts have benefited from the implementation of condition-based maintenance techniques and the use of diagnostic devices to track the health of an aircraft's systems and electronics, he said.

Phillips also noted the delivery of the 100th CH-47F Chinook aircraft, current construction of the first AH-64D Block III Apache aircraft, and fielding of new UH-60M Black Hawk and UH-72 Lakota helicopters. Over the past 12 months, the Army has fielded 118 new Black Hawks and 54 new Lakotas.

These accomplishments come as the Army continues to develop an "aerial tier" for its tactical battlefield network, using technologies such as high-bandwidth waveforms, satellites, and software-programmable radios to connect dismounted Soldiers across the force in real time to on-the-move vehicles and higher-echelon command posts, Phillips added.

Army aviation helps in thickening the combat network by hoisting tactical radios into the air and furthering their reach, such as with a Rifleman Radio inside an RQ-7 Shadow Unmanned Aerial System or in a Black Hawk.

100 CHINOOKS AND COUNTING

The Army recently took delivery of the 100th CH-47F Chinook helicopter aircraft, seen here on display during the 2011 Army Aviation Association of America Annual Professional Forum and Exposition in Nashville, TN in April. (U.S. Army photo by Kris Osborn, ASAALT.)

> " WE MUST WORK HARDER AND QUICKER TO GET THE NETWORK ONBOARD AIRCRAFT SO WE CAN HELP SOLDIERS ON THE GROUND COMMUNICATE. FIELDING THE NETWORK IS THE HIGHEST-PRIORITY PROGRAM THAT WE HAVE IN OUR ARMY, AND AVIATION IS A KEY PART OF THAT. "

"We must work harder and quicker to get the network onboard aircraft so we can help Soldiers on the ground communicate," Phillips said. "Fielding the network is the highest-priority program that we have in our Army, and aviation is a key part of that."

MODERNIZING AIRCRAFT

State-of-the-art avionics, automated flight controls, and a digital cockpit GPS map display are highlights of the new Chinook "F" model helicopters, the latest modernized cargo aircraft. It is built by the Army and its industry partner, Boeing, which constructed 126 units, service officials said.

Engineered with a Common Avionics Architecture System (CAAS) cockpit, the CH-47F Chinook has five multifunctional digital displays, giving pilots key situational and navigational information and aiding in the aircraft's mission of delivering supplies and troops at high altitudes in mountainous terrain, explained LTC Brad Killen, CH-47F Product Manager in Program Executive Office (PEO) Aviation.

The aircraft's digital automated flight control system can help stabilize flight and help the aircraft fly a given route by itself, especially when combined with the functionality of the CAAS cockpit, Killen said.

The new construction of the "F" model Chinook uses a "one-piece," monolithic airframe, whereas previous models were built using rivets, Killen said.

Overall, the Army plans to field at least 440 CH-47Fs by 2018, he said.

This year marks the 50th anniversary of the Chinook helicopter, which completed its first flight in September 1961.

GROUND FIRE DETECTION

Apache attack helicopters will soon be outfitted with a new high-tech Ground Fire Acquisition System (GFAS), which uses cameras and infrared sensors to immediately locate the source of ground fire, service officials said.

The sensors built into GFAS detect muzzle flashes from the ground, allowing Apache pilots to identify immediately the location and distance of ground fire, explained MAJ Justin Highley, Assistant Product Manager Longbow Apache.

Next spring, 1st Battalion, 101st Aviation Regiment from Fort Campbell, KY, will become the first unit equipped with GFAS, he said.

Information from the aircraft's cameras moves through an Aircraft Gateway Processor into the cockpit, which obviates the need to change the aircraft's software, said LTC Jeff Johnson, Product Manager Longbow Apache.

Upon receiving the information on display screens, the aircrew can move their Modernized Target Acquisition Designation Sight/Pilot Night Vision Sensors onto the target at the touch of a button, Johnson explained.

"It is not just about the aircraft, but about getting information to guys on the ground who are in the fight," he said. "Apache has led the way for other platforms with net-centric operations and situational awareness."

Pending a successful outcome of the GFAS User Evaluation, the Apache program manager will look at expanding the system's capabilities, including integrating the technology with Blue Force Tracker display screens, Johnson said.

"GFAS is an offensive targeting system. It is not a piece of aircraft survivability equipment, he said. "It helps us fulfill our mission of closing with and destroying the enemy."

LAKOTA MISSION PACKAGE

The first light utility helicopter (LUH) equipped with a new state-of-the-art mission equipment package is headed to the Army National Guard (ARNG).

EQUIPPING LAKOTAS

LTC Stephen P. Todd and CW5 Edward C. Aldecoa perform start-up checks on one of the Louisiana National Guard's UH-72A Lakota helicopters at the Lakota production center in Columbus, MS. New UH-72A Lakotas will be equipped with a state-of-the-art mission equipment package, while older versions will be retrofitted. (U.S. Army photo by SGT Stephanie J. Cross.)

The package, positioned aboard the UH-72A Lakota LUH, includes an electro-optical/infrared (EO/IR) sensor, enhanced cockpit screens, high-power illuminator system, analog-digital data downlink capability, and GPS-enhanced moving map displays.

A GPS-guided navigation system aboard the security and support (S&S)-equipped aircraft has moving maps and street addresses, which are useful on domestic missions.

"We put a navigation system in, which allows us to put in a street address, and it will navigate pilots to that precise location," said COL Neil Thurgood, then Project Manager Utility Helicopters.

"The pilots will get all the visual cues on how to get there," said Gregory Barth, LUH Project Management Office Avionics lead. "The moving map is a great addition to this aircraft, as it gives pilots a lot more situational awareness."

In addition, an MX15i EO/IR sensor and Data Downlink included in the S&S package allow pilots to view and share key data in real time with ground personnel, while the aircraft's new RT5000 radio system enables it to transmit simultaneously on multiple bands.

"What's unique about this is, not only can we communicate on all the civil band radios, such as police, fire department, hospitals, and first responders, but we can also communicate on the military frequencies," Thurgood said.

The ARNG plans to buy at least 100 UH-72A S&S-package aircraft; 17 will be retrofitted, and 83 will roll new off the production line, Barth said.

The UH-72A is built by EADS North America at its American Eurocopter production facility.

The addition of UH-72As to the Army inventory has freed up at least 23 Black Hawk helicopters for military service overseas, Thurgood said.

"This is important to us," he said. "This is jobs, technical skills, and advanced avionics coming to the United States in support of our military and our industrial base, in support of our mission."

MI-17S FOR AFGHANS, IRAQIS

To enable Iraqi and Afghan forces to continue standing up their own militaries, the U.S. Army is acquiring and sustaining Russian-built Mi-17 helicopters for them, allowing more U.S. forces to return home, service officials said. Both DOD and the Department of State requested the purchases.

" ONE OF OUR CHALLENGES FOR NOW AND THE FUTURE IS TO MAKE SURE THAT WE **TAKE ADVANTAGE OF EVERY DOLLAR** THAT THE AMERICAN TAXPAYER AND CONGRESS GIVE US."

PREPARING THE AFGHANS

Members of the Afghan Air Force assigned to the Kandahar Air Wing perform pre-flight checks on an Afghan Mi-17 helicopter before a practice mission at Kandahar Airfield, Afghanistan, April 19. Plans call for acquiring 21 new Mi-17s for Afghanistan. (U.S. Army photo by SSG Bernardo Fuller.)

"We're buying those systems because our [service members] don't get to come home until [Iraqi and Afghan militaries] take over the mission and are trained to do it," said MG William T. Crosby, Program Executive Officer Aviation. "There's incentive for us."

The Army's Non-Standard Rotary Wing program office plans to acquire 21 new Mi-17s for Afghanistan. The office has already bought 22 Mi-17s for Iraq; 14 of those have been delivered, said COL Norbert Vergez, who oversees the project.

In addition, U.S.-based Northrop Grumman is performing maintenance and sustainment on 52 existing Mi-17s in Afghanistan, Vergez said.

"The primary consideration was based on a desire by the customer, in the case of Afghanistan, to have a platform that they were familiar with and that was simple and easy to operate," Vergez said. "They wanted something that was immediately available for them to assimilate into their armed forces."

The Mi-17 was originally designed by the Russians in the 1970s and was used by the then-Soviet Army in the war between the Soviet Union and Afghanistan. Since then, the Afghan military has used the Mi-17 and become familiar with the aircraft's operation.

Vergez said delivery of the Mi-17s allows the Afghan military to gain further independence, which means fewer military troops are needed in Afghanistan.

"There is no air support for Afghanistan other than the Americans as we establish this capability for Afghanistan," Vergez said. "With every one of these deliveries, we are able to bring Americans home."

*Many presentations from AAAA's 2011 Professional Forum and Exposition are available at **http://www.quad-a.org/index.php?option=com_content&view=article&id=351&Itemid=67**.*

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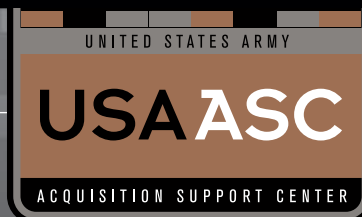
FOCUS:
AFGHANISTAN

by Margaret C. Roth

Multiple commitments and limited access make for new lessons learned as the U.S. Armed Forces work on bringing troops and equipment home from *Operation Enduring Freedom*

Even as U.S. Armed Forces sustain *Operation Enduring Freedom* (*OEF*) in the longest logistics operation in history, planning has begun for the drawdown of troops, which President Obama wants to begin in July 2011.

It is a complex picture, made all the more so by multiple humanitarian responsibilities around the globe and political unrest on two continents.

By just one measure of activity, in 2011 alone more than 100 million pounds of materiel will have been airdropped into Afghanistan to support the 100,000 U.S. troops there. It is time to start positioning to remove some of those troops and materiel from *OEF*, said logistics leaders from across the military services, who laid out the challenges ahead at the Association of the United States Army (AUSA) Institute of Land Warfare's Army Sustainment Symposium and Exposition May 10-12 in Richmond, VA.

It used to be that for a logistician in the Army, the expertise and emphasis were on deployment planning, but not much thought was given to getting home, said MG Kevin A. Leonard, Commanding General, U.S. Military Surface Deployment and Distribution Command. But Army Force Generation requires that deployment and redeployment be equally important, he said.

In *OEF*, he noted, 97 percent of Brigade Combat Teams are deploying on time, but getting home is more of a challenge.

Besides the sheer volume of cargo to be moved, an ongoing challenge has been diversifying transit routes in concert with commercial carriers. Also key is maintaining and improving security controls over materiel in transit (See "Cargo Control" on Page 58.)

Just as lessons learned from the drawdowns from Iraq and previous conflicts influence planning

CROSSING THE BORDER
The U.S. military is looking for alternate routes to move troops and materiel into and out of Afghanistan, in addition to the border crossings from Pakistan, such as the Torkham Gate, shown here. Torkham Gate, in the Hindu Kush mountain region, is the busiest supply entry point for U.S. and NATO coalition forces throughout Afghanistan. (U.S. Army photo by SSG Ryan Matson.)

for the drawdown from *OEF*, new lessons are being learned that will help define future sustainment operations.

ONE OBJECTIVE, MANY ROUTES

The complexities of politics and terrain have made it critical to diversify transit routes and modes of transport between Afghanistan—especially the northern region—and the United States, senior leaders said.

In 2008, U.S. forces had one route in and out of northern Afghanistan, through Pakistan; now there are at least three coherent routes, with multiple modes of transport, said U.S. Navy Vice Admiral VADM Mark D. Harnitchek, Deputy Commander, U.S. Transportation Command (TRANSCOM). Routes have been established through Central Asia from Western and Central Europe and from Pacific ports via Siberia.
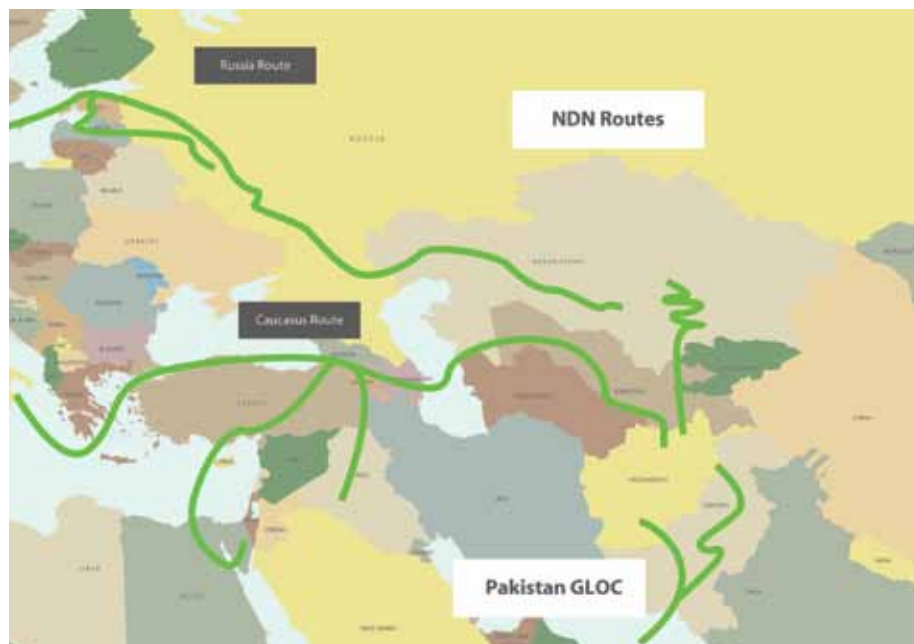
"None of us thought that we would be transiting Siberia," Leonard noted. The experience of diversifying routes reminds him of Dr. Seuss' book *Oh, the Places You'll Go*, he said. "We have gone to some very interesting places as we've worked on the problem set in Afghanistan."

Using the multiple available routes, "we must make redistribution one of our priorities" across the operational environment and back to CONUS, said BG Philip R. Fisher, Commanding General of the Mississippi National Guard's 184th Expeditionary Sustainment Command. The 184th is in charge of Joint Sustainment Command-Afghanistan, the senior supply and logistics command for all U.S. forces in Afghanistan.

Building redundancy into shipping routes costs money, as well as time. It costs $3 per pound to transport by air vs. 30 cents per pound by ground, Harnitchek said, and the newer routes take longer.

One way to reduce the logistics costs, of course, is to reduce the tonnage. Specifically, Harnitchek said, the U.S. military needs to reduce the demand for fuel in theater and to identify efficiencies in fuel loading and consumption, as fuel is a major component of the tonnage shipped. (For more on reducing energy demands, read *Shaping Sustainment for Tomorrow*, an article by LTG Mitchell H. Stevenson, Deputy Chief of Staff, G-4, in the May 2011 issue of AUSA's *Army* Magazine, available at ***http://www.ausa.org/publications/armymagazine/archive/2011/5/Pages/default.aspx*.**)

RELIANCE ON COMMERCIAL SHIPPING INDUSTRY

The United States could not maintain a global military presence without the commercial shipping industry, senior logistics leaders and a senior shipping executive agreed.

Eric L. Mensing, President and Chief Executive Officer of APL Maritime Ltd. and Vice President, Government Trade and Affairs of APL Ltd., noted that 21 percent of materiel shipped in *Operation Desert Storm* moved on commercial carriers; for *OEF*, the proportion is 77 percent. Foreign-flagged vessels, by contrast, account for 0.2 percent of the shipping in *OEF* vs. 23 percent during *Desert Storm*.

Mensing described the U.S. flag carrier fleet's support for operations in Afghanistan as "logistics on steroids ... without a doubt the most complicated logistics program that my company's ever been involved in."

Commercial carriers can change directions and adjust their shipping networks rapidly, he said, while creating no military footprint—an increasingly important factor in politically sensitive regions of the world.

OEF **SURFACE DISTRIBUTION**

This map illustrates the multiple transit routes into and out of Afghanistan, including the Northern distribution network (NDN) and Pakistan ground lines of commmunication (GLOC). SOURCE: June 23, 2010, TRANSCOM presentation at AUSA Institute of Land Warfare Army Sustainment Symposium and Exposition.

GENERATOR TRANSPORT

Service members offload a High-Mobility Multipurpose Wheeled Vehicle carrying a power generator at Cap Draa, Morocco, May 6, during African Lion 2011, a U.S.military-Royal Moroccan Armed Forces exercise that included a rapid port opening and joint logistics operations over shore. (U.S. Army photo by SPC Cody Campana.)

Diversification of shipping approaches is driving more competition in commercial shipping, Leonard said, which means greater value for the U.S. military. The shipping industry itself is diversifying into new inland and ancillary services, which Mensing said helps finance the industry's support for military operations in Iraq and Afghanistan.

LESSONS LEARNED IN IRAQ, AFGHANISTAN

"There are wonderful lessons learned from our experience in Iraq that need to be applied [to the drawdown] in Afghanistan," said COL John "Skip" O'Neil, Commander of the 82nd Sustainment Brigade. "We will do it better, faster, cheaper than we did in Iraq. We'll have to do this really well, in my estimation, to meet the expectations of the American public."

TRANSCOM and the Defense Logistics Agency (DLA) have been tasked by the Secretary of Defense and the Vice Chairman of the Joint Chiefs of Staff to develop a comprehensive plan for the positioning and distribution of DOD materiel. DLA is conducting a Strategic Network Optimization review of its global distribution enterprise, "looking at not only what's in these distribution centers and is it still needed, but also do we have the distribution centers in the right locations, the best

support to the Armed Forces, and do we have the right number," said DLA Director U.S. Navy VADM Alan S. Thompson.

Current planning tools are largely grounded in Cold War realities, Harnitchek said.

Whereas the cornerstone of national military strategy remains the ability to prosecute two nearly simultaneous conflicts, the present-day reality is one of globally diverse operations, including irregular warfare, stabilization operations, and support for homeland defense—in addition to sustaining long-term contingency operations, such as those in Iraq and Afghanistan, he said.

The further in advance logistics operations can be integrated, the faster and more economical the transport will be, he said, adding that in hindsight, TRANSCOM, U.S. Central Command, and the Department of State could have considered the risk of failure in the ground route through Pakistan in 2005, the year of the earthquake north of Islamabad, and taken steps to mitigate the risk.

Harnitchek sees two equally important lines of logistics operations: the physical movement of troops and materiel, and movement of information in cyberspace.

"We don't control all the pieces of the cyber domain through which our information flows. ... If our adversaries can slow us down by a week in the cyber domain, that could have a significant effect on the outcome."

The services are focusing particularly on logistics operations in austere areas where the U.S. military might be called to respond.

"It's not always going to be places with really robust capability. We're going to fight in austere environments," Leonard said. In preparation, U.S. troops recently completed the annual African Lion exercise, a bilateral U.S.-Moroccan exercise and the largest to date in the U.S. Africa Command area of responsibility.

More than 2,000 U.S. service members from every branch of the military, including both active and reserve components, worked alongside more than 900 members of the Royal Moroccan Armed Forces in the exercise, which was designed to promote interoperability and mutual understanding between the nations' militaries. The exercise included a rapid port opening and joint logistics operations over shore.

TRANSCOM is working to better understand and forecast the requirements and impacts of rapidly disengaging forces from one theater and moving them to another, Harnitchek said, "so we're not playing catch-up with crisis action and contingency planning."

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CARGO
CONTROL

Technology promises to help thwart thieves

by Margaret C. Roth

The United States' adaptive adversaries in Afghanistan, in addition to posing a direct threat to the country and allied troops, have also proved to be an indirect threat as they target supplies in transit that support the warfighter.

KEEPING IT MOVING

A Soldier drives a forklift to move a container box for loading onto a truck outside the Joint Combat Operating Base at Pul E Sayed, Parwan Province, Afghanistan. (U.S. Army photo by SSG Horace Murray.)

In response to the ever-evolving threat of thievery, the U.S. Armed Forces are harnessing new technology to prevent pilferage of cargo.

"The bad guys are getting smarter," said Eric L. Mensing, President and Chief Executive Officer of the shipping company APL Maritime Ltd., and Vice President, Government Trade and Affairs of APL Ltd.

Existing tools are designed primarily for tagging and tracking cargo. They include the In-Transit Visibility (ITV) system, a fusion of logistics information and distribution technologies. ITV uses Radio Frequency Automatic Identification Technology to identify, locate, and track the movement of all classes of supply from source to user.

Tracking has come a long way, even from just five years ago, and has a ways to go, Mensing said at the Association of the United States Army Institute of Land Warfare's Army Sustainment Symposium and Exposition May 10-12 in Richmond, VA.

"We reasonably should be tagging every box that goes through," keeping the tags on the containers to be returned with them, Mensing said. As it is, a shipment may be signed for at a storage facility gate and then disappear. The shipping industry can provide security, but it should be a DOD responsibility, he said.

ITV has allowed for almost 100 percent tagging of containers to track them from node to node in the distribution network, said U.S. Marine Corps BGen William M. Faulkner, Vice Director for Logistics, J-4, on the Joint Staff. That supports a common operational picture across combatant commands and distribution networks, but the services' ability to

GLOBAL LOGISTICS
SPC Vincent Valone, a motor transport driver with the 407th Brigade Support Battalion, 2nd Brigade Combat Team, guides the loading of storage containers filled with equipment and supplies onto a Heavy Expanded Mobility Tactical Truck-Load Handling System in Port-au-Prince, Haiti. (U.S. Army photo by SSG John S. Laughter, 2nd Brigade Combat Team Public Affairs Office.)

respond promptly to incidents of pilferage when they are identified is still limited by the sheer size of the area of operations, Faulkner said.

"Cargo needs real-time, in-transit visibility," especially when we don't control the route, said U.S. Navy VADM Mark D. Harnitchek, Deputy Commander, U.S. Transportation Command (TRANSCOM).

Among the technologies that promise to help reduce pilferage is a "smart container" that the Army is testing with a unit's deployment to Afghanistan. The "smart container," made of a lightweight polymer, integrates global satellite communication capabilities for monitoring its location. Sensors can detect tampering, environmental conditions, and jarring of the container. Tamper-proof locks, alarms, and internal security cameras provide additional security.

The Army is also working with TRANSCOM to develop next-generation wireless capability for near-real-time tracking of materiel throughout its distribution chain. The U.S. Army Materiel Command and the Army's Logistics Innovation Agency

have conducted a successful proof-of-principle demonstration of the new capability in Kuwait, as a possible replacement for radio-frequency identification.

On a related note, the Defense Logistics Agency (DLA) is looking at breakthrough technologies, such as DNA markers, to prevent counterfeiting of spare parts, especially microelectronics, said U.S. Navy VADM Alan Thompson, DLA Director. These technologies could also be useful to the services in controlling theft, he said.

"We're very, very close to [being] able to deliver real-time, actionable intelligence" on pilferage in progress, said MG Kevin A. Leonard, Commanding General, U.S. Military Surface Deployment and Distribution Command. In the meantime, "Cargo at rest equals cargo at risk."

MARGARET C. ROTH is the Senior Editor of Army AL&T *Magazine. She holds a B.A. in Russian language and linguistics from the University of Virginia. Roth has more than a decade of experience in writing about the Army and more than two decades' experience in journalism and public relations.*

YOU NEED TO KNOW

Protecting weapon systems program information: A policy and legislative update

by Peter M. Velz

DOD policy on cyber security and program protection is undergoing significant changes, in recognition of the increased threat to the integrity of weapon, communications, and information systems resulting from the reliance of these systems on digitized information and the possible compromise of program information used to develop and build those systems.

NETWORK SECURITY
The integrity of weapon systems increasingly depends on managing the risk of losing the most sensitive unclassified program information to cyber attacks on contractors' unclassified networks by our adversaries. (*Army AL&T* Magazine file photo image.)

To address these complex challenges and enhance the likelihood that acquisition program managers (PMs) can deliver systems to the warfighter that function as intended, DOD is conducting pilot programs to develop new risk mitigation strategies, concepts, and processes.

Congressional interest in and support for these efforts gained significant traction in the *National Defense Authorization Act* (*NDAA*) *for Fiscal Year 2011*. Within the Army, the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASAALT) is coordinating these policy efforts as they mature. They increasingly will become a standard part of acquisition program risk management, taking into account a variety of factors, such as cost, threat, criticality of particular components to a system's functionality, and technological lead relative to potential adversaries.

POLICY UNDERPINNINGS

It is DOD policy that the Department, its contractors, and its subcontractors will provide adequate security to safeguard DOD information on their unclassified information systems from unauthorized access and disclosure. The integrity of weapon systems increasingly depends on managing the risk of losing the most sensitive unclassified program information to cyber attacks on contractors' unclassified networks by our adversaries. DOD Instruction (DODI) 5205.13, *Defense Industrial Base* (*DIB*) *Cyber Security/ Information Assurance* (*CS/IA*) *Activities*, dated Jan. 29, 2010, establishes the policy framework for DOD's main effort to work with DIB partners within a pilot program to mitigate that risk.

This instruction directs the heads of DOD components to, among other things, "Based on USD(AT&L) [Undersecretary

DOD NETWORK
Mission-critical functionality of DOD's systems and networks extensively leverages commercial, globally interconnected, globally sourced information and communications technologies. (U.S. Army photo.)

of Defense for Acquisition, Technology, and Logistics] policy guidance, develop procedures and conduct cyber intrusion damage assessments in support of DIB CS/IA activities to determine the overall impact of the exfiltration or modification of data on current and future weapons programs, scientific and research projects, and warfighting capabilities stemming from unauthorized intrusions into DIB unclassified information systems."

More specific policy directing the inclusion of language in contracts and agreements requiring protection of DOD information held by contractors is found in Directive-Type Memorandum (DTM) 08-027, *Security of Unclassified DoD Information on Non-DoD Information Systems*. Some examples of information assurance practices that should be addressed in contracts include:

• Do not process DOD information on public computers or on computers that do not have access controls.

• Protect information by at least one physical or electronic barrier (e.g., locked container or room, login and password) when not under direct individual control.

• Encrypt all information that has been identified as controlled unclassified information (CUI) when it is stored on mobile computing devices or removable storage media, using the best available encryption technology.

• Limit information transfer to these subcontractors or teaming partners who have a need to know and a commitment to at least the same level of protection.

There is a recognition that further DOD guidance is needed to ensure that PMs and contracting officers have the tools they need to understand and implement this policy, including specific contract clauses, compliance assessment, and what is chargeable by the contractor.

Some of these issues are being addressed in the development of Defense Federal

Acquisition Regulation Supplement Case 2008-D028, *Safeguarding Unclassified Information*. This case would add a new subpart and associated contract clauses for the safeguarding, proper handling, and cyber intrusion reporting of unclassified DOD information that resides on or transits contractors' unclassified information systems.

DOD published notice of this case in the *Federal Register* on March 3, 2010, and held an initial public hearing on it on April 22, 2010.

Categories of DOD information that would require protection include: critical program information (CPI); information subject to export control under *International Traffic in Arms Regulations* and Export Administration regulations; personally identifiable information; and other categories of CUI.

Among other things, contractors would be required to:

- Implement information security in any project, enterprise, or company-wide unclassified information technology system using specified minimum security controls.
- Report to DOD any relevant cyber intrusion events.
- Support the forensic analysis of those data for purposes of conducting assessments of damage to acquisition and other programs.
- Procure and use only DOD-approved identity authentication credentials to, for example, receive emails from Army PMs containing data files with CPI.
- Include the substance of this clause in certain subcontracts.

TRUSTED DEFENSE SYSTEMS
Another key policy focus for mitigating risk of losing critical unclassified information is the effort to ensure trusted

defense systems by managing the supply chain risk for those systems, particularly to protect mission-critical software and hardware components. Mission-critical functionality of DOD's systems and networks extensively leverages commercial, globally interconnected, globally sourced information and communications technologies. Consequently, adversaries have more opportunities to corrupt technologies, introduce malicious code into the supply chain, and otherwise gain access to the Department's military systems and networks.

The policy framework to address this challenge is established by DTM 09-016, *Supply Chain Risk Management* (*SCRM*) *to Improve the Integrity of Components Used in DoD Systems*. During development of a system, the PM determines which software and hardware components within the system are critical and then determines, based on identified threat and vulnerability, how to protect it with the support of

experts from various disciplines, including counterintelligence, intelligence, security, systems engineering, and policy.

This policy establishes a process that involves extensive collaboration among the DOD components to manage these risks. Army program executive officers (PEOs) and PMs engage in this process as part of the development and updating of their program protection plans at each milestone review.

KEY LEGISLATION
The congressional defense committees are playing a critical role in identifying and highlighting the need to improve cyber security. Two particular provisions in the *NDAA* for FY11 pertain to acquisition and address the issues outlined above. They are:

- Section 806, *Requirements for Information Relating to Supply Chain Risk.* Congress has given DOD new authority

COMPUTER DEFENSE ACTION
DODI 5205.13 establishes the policy framework for DOD's main effort to work with DIB partners within a pilot program to mitigate the risk of losing sensitive unclassified program information to cyber attacks. Here, Jerod Young, an analyst in a Current Operations Cell, examines data during a computer defense action in Europe. (U.S. Army photo.)

to exclude sources due to supply chain risk to a national security system or information technology item. The use of this authority by the head of a covered agency—for example, by the Secretary of the Army—must be based on a joint recommendation by the USD(AT&L) and the DOD Chief Information Officer, resulting from an intelligence-based risk assessment by the USD for Intelligence.

The USD(AT&L) must certify in writing, among other things, that use of this authority is "necessary to protect national security by reducing supply chain risk." The Secretary of the Army cannot delegate this authority below the Army Acquisition Executive. Of note, no action taken under this authority shall be subject to review in a bid protest before the Government Accountability Office or in any federal court.

The Senate Armed Services Committee recommended this provision following submittal by DOD of a report to Congress on December 22, 2009, as required by Section 254 of the *Duncan Hunter National Defense Authorization Act for Fiscal Year 2009*. The Committee Report on the 2011 *NDAA* states, "The report found an increasing risk that systems and networks critical to DOD could be exploited through the introduction of counterfeit or malicious code and other defects introduced by suppliers of systems or components. The committee concludes that the Secretary [of Defense] should have the authority needed to address this risk."

- Section 935, Reports on Department of Defense Progress in Defending the Department and the Defense Industrial Base from Cyber Events. This provision expresses congressional interest in and

THERE IS A RECOGNITION THAT FURTHER DOD GUIDANCE IS NEEDED TO ENSURE THAT PMS AND CONTRACTING OFFICERS HAVE THE TOOLS THEY NEED TO UNDERSTAND AND IMPLEMENT THIS POLICY.

concern about the threat to defense contractors' networks. This section requires an annual report from the Secretary of Defense on DOD's progress in defending the Department and defense contractors' networks from cyber events.

One of the requirements of this provision is that the report include a description of the nature and scope of significant cyber events against the DIB during the preceding year, including the impact of such events on DOD generally and on operational capabilities; and, for any such event that has been investigated by or on behalf of the DOD Damage Assessment Management Office, a synopsis of each damage assessment report, with emphasis on actions needing remediation.

These assessments are done through the work of the DOD and the services' damage assessment efforts within the DIB CS/IA Program, supported by subject-matter experts (SMEs) from affected acquisition program offices, and will be reported to Congress in classified form.

WHAT PEOS AND PMS SHOULD DO

DOD is maturing its capability to understand and mitigate the risk of losing of weapon system data. In the digitized, networked world, large quantities of program data reside on unclassified networks, and managing the risk to this information

is something that acquisition PMs must incorporate into their activities, drawing from the multilayered approach that DOD is developing.

PEOs, PMs, and other Army SMEs can draw from this maturing capability to enhance the security of their programs. For example, they should:

- Develop their program protection plans as early as possible in the acquisition cycle and maintain close collaboration with Army headquarters components that can facilitate this process, including conducting supply chain risk management assessments.
- Continually remind contractors' project engineers with whom the PM team engages and shares digitized information about the importance of information assurance.
- Work with their contracting officer to use local contract clauses that reinforce the importance of protecting the most critical data held on contractors' unclassified networks.
- Support requests to provide SMEs to execute the damage assessment process pursuant to DODI 5205.13.

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THOUGHT LEADERS

The Army's senior scientific professionals

by Dr. Scott Fish

Sometimes hidden in the midst of the more than 11,000 Army laboratory and technical center scientists and engineers are a select few senior scientific professionals with very important roles to play in guiding and executing essential research and engineering. These key professionals help ensure that our Soldiers have the best capability possible in a complex, ever-changing environment.

ADVANCING CAPABILITIES

Jill Smith, Director, U.S. Army Communications-Electronics Research, Development, and Engineering Center (CERDEC) (middle), talks to Dr. Meimei Tidrow (left) and Dr. Tom Broach about a prototype robotic countermine/counter-IED system at CERDEC Night Vision and Electronic Sensors Directorate (NVESD). Tidrow is the Chief Scientist for Focal Plane Arrays at NVESD, Fort Belvoir, VA, and Broach is the Chief Scientist for Countermine and Counter-IED technologies. (U.S. Army photo by Kimberly Bell, CERDEC-NVESD Public Affairs Office.)

W e don't hear much about these people because they are modest, and their positions are not as well-recognized as their management counterparts within the Senior Executive Service (SES).

This article is intended to highlight the Scientific Professional Corps (ST Corps) and to demonstrate, through wider awareness, the impact these special people can make on our products for the warfighter.

ROLES, RESPONSIBILITIES

The ST Corps was created in 1998 to establish SES protocol-equivalent positions to promote excellence in scientific and technical work through a long-term career path alternative to entering management. The STs are the highest-ranking technical personnel, and their positions are the equivalent of chaired professors at leading research universities. The ST professional carries the following responsibilities within his or her organization:

- Serve as an advocate for the Army's engineers, mathematicians, and scientists.
- Promote collaborative research and technical interchange with scientists and scientific organizations external to the Army at both national and international levels.
- Encourage participation in external scientific and technical meetings, symposia, and publications, and support collaboration among DOD and its services.
- Advocate actions and policies that maintain the stability of basic and applied research, technology development, and technology base programs within the Army.
- Advise and consult on technical matters to the Army's civilian and military executives and other government agencies.
- Provide a catalyst for change in research programs, research organizational structure, and planning for future science.
- Perform voluntary, self-imposed functions related to the collective expertise of the ST Corps that aid the Army and the United States of America.

The ST Corps is chaired by one of its members. This corps provides a forum for interaction among members to exchange ideas, plan activities, and perpetuate the organization.

An important additional ST Corps activity not widely known is the technical assessment that drives recommendations for the Small Business Innovative Research Program within the Army.

QUALIFICATIONS

The qualifications to be considered for an ST position, which is generally referred to as the chief scientist for the organization, are the following:

- Has authored fundamental papers in the field of expertise that are widely used and cited.
- Has received significant honors from major organizations for his or her accomplishments and contributions.
- Is sought as an advisor and consultant on scientific and technological problems that extend beyond his or her specialty.

These qualifications put the ST in a position both to continue advanced technical work and to offer respected technical perspective to the organization's SES leadership. The ideal laboratory or technical center leadership construct has the ST serving as a senior trusted advisor to the director on strategic issues related to the

THE IDEAL LABORATORY OR TECHNICAL CENTER LEADERSHIP CONSTRUCT HAS THE ST SERVING AS A SENIOR TRUSTED ADVISOR TO THE DIRECTOR ON STRATEGIC ISSUES RELATED TO THE TECHNICAL WORKFORCE, RESEARCH, AND DEVELOPMENT OF EQUIPMENT AND FACILITIES.

technical workforce, research, and development of equipment and facilities.

The ST also advises on trends in technology related to the organization's long-term productivity. This can be a delicate balancing act for the ST, who also serves as a mentor to junior scientists and engineers and who continues to conduct high-quality research.

WHO THEY ARE

The Army currently has 42 ST positions filled, with four in the confirmation process at this time. The filled positions are noted below for technical reference; they are points of contact across our Army laboratory system in their respective areas of expertise.

Henry Everitt (optical sciences), U.S. Army Aviation and Missile Research, Development, and Engineering Center (AMRDEC)

Jester (Jay) Loomis (radio frequency sensors), AMRDEC

Michael Scully (rotorcraft aeromechanics preliminary design), AMRDEC

Paul Ruffin (micro sensors), AMRDEC

Mark Tischler (rotorcraft flight dynamics and control), AMRDEC

Richard Fong (warheads technology), U.S. Army Armament Research, Development, and Engineering Center (ARDEC)

Donald Carlucci (computational structural modeling), ARDEC

Ernest Baker (insensitive munitions), ARDEC

Ananthram Swami (network science), U.S. Army Research Laboratory (ARL)

Bruce West (mathematical sciences), ARL/Army Research Office (ARO)

Stephen Lee (interdisciplinary/GPS), ARL/ARO

Peter Reynolds (physical sciences), ARL/ARO

Tomasz Letowski (Soldier performance), ARL-Human Research and Engineering Directorate (ARL-HRED)

Kwong-Kit Choi (physical sciences), ARL-Sensors and Electron Devices Directorate (ARL-SEDD)

Nasser Nasrabadi (sensors), ARL-SEDD

Paul Shen (nuclear/electronics survivability), ARL-SEDD

Joseph Mait (electromagnetics), ARL-SEDD

Shashi Karna (nanofunctional materials), ARL-Weapons and Materials Research Directorate (ARL-WMRD)

James McCauley (ceramic materials), ARL-WMRD

Brad Forch (ballistics research), ARL-WMRD

Arthur Ballato (electromagnetics), U.S. Army Communications-Electronics Research, Development, and Engineering Center (CERDEC)

Paul Zablocky (electronic warfare technology), CERDEC

Thomas Broach (counter mine/counter IED technology), CERDEC

MeiMei Tidrow (electro-optics technology), CERDEC

Jose-Luis Sagripanti (biochemistry), Edgewood Chemical Biological Center (ECBC)

James Valdes (biotechnology), ECBC

Augustus (Way) Fountain (chemistry), ECBC

Donald Resio (coastal systems), Engineer Research and Development Center (ERDC)

Paul Mlakar (weapons effects/structural dynamics), ERDC

John Peters (near surface phenomenology), ERDC

Jeffery Steevens (biotechnology), ERDC

Todd Bridges (environmental science), ERDC

Edward Perkins (environmental networks and genetic toxicology), ERDC

Leonard Smith (medical countermeasures), U.S. Army Medical Research and Materiel Command (MRMC)

Connie Schmaljohn (medical defense against infectious disease), MRMC

Jaques Reifman (advanced medical technology), MRMC

Armand Cardello (human behavior and performance), Natick Soldier Research, Development, and Engineering Center (NSRDEC)

Claire Gordon (biological anthropology), NSRDEC

James Overholt (robotics), U.S. Army Tank Automotive Research, Development, and Engineering Center (TARDEC)

David Gorsich (general engineering), TARDEC

Brian Strickland (directed energy), U.S. Army Space and Missile Defense Technical Center

Douglas Brungart (auditory science), Walter Reed Army Medical Center

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DR. SCOTT FISH is the Army's Chief Scientist. He holds a B.S. in mechanical engineering from the University of Texas at Austin, M.S. degrees in mechanical engineering and naval architecture from the Massachusetts Institute of Technology, and a Ph.D. in mechanical engineering from the University of Maryland, College Park.

Accuracy in
ARMAMENTS

Choosing the appropriate dispersion metric to evaluate weapon and munitions precision

by SSG Douglas Ray (USA Ret.)

When a sniper is in the prone firing position on a shooting range, he is not thinking about the math behind the shot group dispersion, or distribution of the round impacts on the target in front of him. He is concerned with the "zero" of his weapon's aiming system, and with his own ability—and that of his weapon system—to put each round as close to the others and as close to the aimpoint as possible. The sniper thinks about these things in training, so that he does not have to worry about them in combat.

ON TARGET
(Previous page, left to right) Soldiers with 1st Battalion, 4th Infantry Regiment look for suspicious activity from an observation point during an area reconnaissance mission in Zabul Province, Afghanistan. (DOD photo by SPC Joshua Grenier, U.S. Army.)

Soldiers from 4th Battalion, 23rd Infantry Regiment arrive at an Afghan National Police checkpoint in Helmand Province, Afghanistan. (U.S. Army photo by TSGT Efren Lopez.)

Soldiers from 173rd Airborne Brigade Combat Team train at the Joint Multi-National Training Center in Hohenfels, Germany. (U.S. Army photo by Gary L. Kieffer.)

(This page) Scouts with the 82nd Airborne Division's 1st Brigade Combat Team fire on a line during a course in advanced rifle marksmanship March 21-24, 2011, at Fort Bragg, NC. (U.S. Army photo by SGT Michael J. MacLeod.)

Some of the statistical techniques used by armaments engineers and scientists to evaluate the accuracy and precision of weapons and munitions can result in increased risk to the warfighter. It is the responsibility of the armaments community to fully understand the statistical implications of choosing a specific dispersion metric to assess performance.

TARGET IMPACT DISPERSION MODEL

The bivariate normal impact distribution approach is used to model the dispersion of shot groups on a target, whether for small-caliber ammunition being fired at paper targets on a shooting range, artillery rounds impacting a target area on the ground, or darts being thrown at a dartboard.

When, for example, 10 rounds are fired at a target on a rifle range in what is typically referred to as a "shot group," each of their impact locations is a point (x_i, y_i) on the two-dimensional surface. Most of the rounds will tend to cluster around the center of impact (CoI), which is the average of all points in the x and y direction (x, y), and is the best estimator of the true mean (μ_x, μ_y). If the weapon's aiming system is in zero with the ammunition, this means that the mean (μ_x, μ_y) is aligned with the point of aim such that $(\mu_x, \mu_y) = (0, 0)$. Therefore we can disregard aiming error, and for the purpose of this discussion concern ourselves only with the weapon system's precision.

Weapon system precision is defined by the expected error of an individual round, or "sigma" (σ).

As the distance from the CoI increases radially (where distance = $\sqrt{(x_i - \mu_x)^2 + (y_i - \mu_y)^2}$) on the target, the frequency of shot impacts should decrease in a manner directly related to the magnitude of σ_x

and σ_y, as defined by the Bivariate Normal Impact Distribution. This is similar to the way in which the distance in 'k' σ's from the mean of the normal distribution (with which many of us are already familiar) affects the frequency of data. That is, 95 percent fall within the range described by $-1.96\sigma < \mu < 1.96\sigma$. This relationship affords the analyst the ability to calculate the hit probability, or P[Hit], given a specified target size and shape in relation to (σ_x, σ_y), by calculating the area under the distribution's surface in the x and y direction spanned by the target.

MEASURES OF DISPERSION AND MINUTE OF ANGLE

An often-heard expression in long-distance shooting circles is "minute-of-angle," or MOA. A "1 MOA weapon system" refers to the ability of the weapon and ammunitions to consistently shoot three- to five-round groups that measure approximately 1 inch at 100 yards, approximately 5 inches at 500 yards, approximately 10 inches at 1,000 yards, etc. But without details about the method used to measure the shot group, we are lacking important contextual information.

Dispersion metrics commonly used to measure weapon or munition shot group precision include mean radius (MR), radial standard deviation (RSD), circular probable error (CPE), extreme horizontal and vertical spread (EHS/EVS), mean horizontal and vertical deviation (MHD/MVD), extreme spread (ES), etc.

In fact, each of these measures is directly related to σ, which we previously defined as the expected error of an individual round. For any group of shots on a target, we can calculate all of these measures simultaneously.

RESEARCH AND DEVELOPMENT

Soldiers from the 82nd Airborne Division visit the Aviation and Missile Research, Development and Engineering Center's Small Unmanned Aerial Vehicle Laboratory. (U.S. Army photo by Merv Brokke.)

$$f(x,y|\rho) = \frac{1}{\sqrt{2\pi}\sigma_x\sigma_y\sqrt{1-\rho^2}}\,e^{\left\{-\frac{1}{2(1-\rho)^2}\left[\left(\frac{x-\mu_x}{\sigma_x}\right)^2 - \frac{2\rho(x-\mu_x)(y-\mu_y)}{\sigma_x\,\sigma_y} + \left(\frac{y-\mu_y}{\sigma_y}\right)^2\right]\right\}}$$

BIVARIATE APPROACH
Bivariate Normal Impact Distribution, where ρ = Correlation(x, y).

APPLICATIONS OF VARIOUS METRICS

There are times when some of these dispersion metrics may be more desirable than others, depending on the intended application. The use of certain metrics relies on the assumption that $\sigma_x = \sigma_y$. This null hypothesis can be easily tested with a variation of the F-test that is commonly used in statistics. These measures have varying levels of statistical efficiency associated with them. Depending on available resources, some may be much easier to calculate than others.

For example, a rifleman or Soldier zeroing, or confirming zero on a shooting range, typically shoots three- to five-round groups and is concerned mainly with the difference between the aimpoint and the observed CoI. This same rifleman honing his or her marksmanship skills may be more interested in the distance between the two farthest points on the target, or ES. Though ES is one of the least efficient methods to calculate dispersion, in this case it is desired because of its simplicity; it requires no use of mathematics, and in fact does not even require (x, y) coordinates of the rounds on target. All that is needed is a straightedge to measure the two points that are farthest apart.

An entirely different application is used in ammunition Lot Acceptance Testing (LAT) for accuracy, in which a relatively small quantity of ammunition (a random sample) is pulled from a larger population (ammunition lot). The sample typically is tested in one or several rigid-mounted accuracy barrels, which are used as gauges to minimize the weapon system's influence on shot dispersion, so that the ammunition may be judged solely on its performance. Often, with small-caliber ammunition, MR is used to measure dispersion. The MR technique uses the distance formula shown above to determine the distance of each round from the CoI, and then takes the average of all of the points' radial distances.

Other common methods are CPE (for some artillery and shoulder-fired rockets), RSD (the most efficient method), and EHS/EVS (for 7.62mm M118LR sniper ammunition).

In LAT accuracy testing, the total sample quantity, breakout of rounds per target vs. number of targets in the test, and the method used to calculate the dispersion of the rounds on each target all contribute to the risks associated with accepting or rejecting lots of material.

In determining LAT quantities and acceptance criteria, operating characteristic (OC) curves are often used. They are useful to the statistician and quality engineer in that they model the probability of acceptance, or P[a], of lots of materiel, given some rate of nonconformity (or some other characteristic) within the lot. Acceptance criteria are set with the objective of rejecting lots that fail to meet these criteria ("bad" materiel), and accepting lots that meet the criteria ("good" materiel). There are, however, two other

OPERATING CHARACTERISTIC CURVE
OC curve of the LAT performance difference due to dispersion metric.
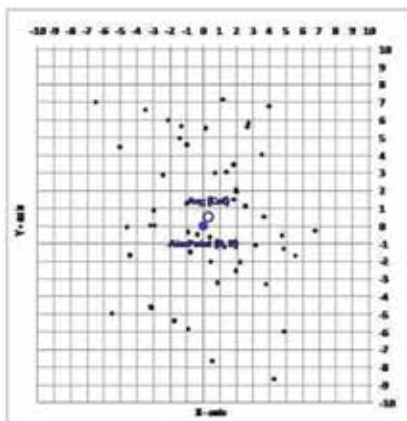
MONTE CARLO SIMULATION

Monte Carlo Simulation of a target with 50 points, Col = (0.31, 0.51), σ_x = 3, and σ_y = 4.
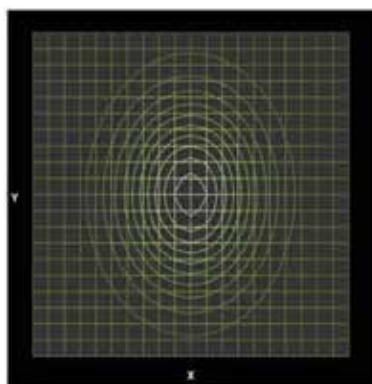
BIVARIATE DISTRIBUTION

Bivariate Normal Distribution with μ_x, μ_y, and $\rho = 0$, $\sigma_x = 3$, and $\sigma_y = 4$.
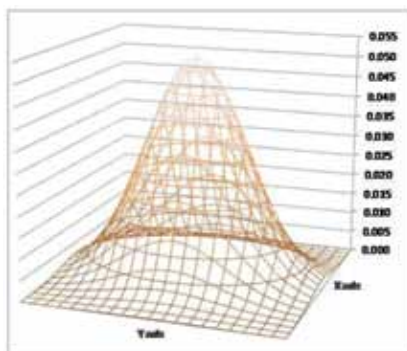
OBLIQUE PROJECTION

Oblique projection of probability density of above distribution.

possibilities, which we call α and *β* risk: the probability of "good" materiel failing to meet the criteria (false reject), and the probability of "bad" material passing the criteria (false acceptance).

These risks may increase or decrease, depending on the test quantities and acceptance criteria used in LAT. This is what is called "discrimination."

EXAMPLE: SMALL-CALIBER AMMUNITION

For example, some recent 7.62mm M80 ball LAT data provide an idea of the past performance of this ammunition relative to its accuracy requirement. Using a mathematical relationship between the different measures of accuracy, we could select an average ES and maximum ES requirement comparable to the current LAT requirement of 7.5-inch average MR (AMR). This can be verified graphically where the inflection points (50th percentiles of P[a]) of the OC curves of each should be approximately aligned.

Keeping the sample sizes and number of targets in the LAT constant, we can perform numerous Monte Carlo simulations across a range of *σ*'s, which will allow us to compare the discrimination of the proposed LAT requirement with the current requirement.

Comparing the OC curves of the dispersion metrics illustrates the increased risk associated with switching to a maximum ES requirement vs. averaging the targets. The risk of falsely rejecting good ammunition (α-risk) increases to ~25%, and the risk of falsely accepting bad ammunition (β-risk) increases to ~20% at the same points where AMR α = β = ~10%. This result can be deduced intuitively by understanding the nature of these different measures: Whereas ES uses only information from two rounds per target, MR uses

information from all rounds and therefore is much more statistically efficient.

Over the course of numerous LATs, this increase in risk translates to excessive non-value-added production costs, reduced performance, and schedule impact. In this example, these are all due to using a different method to calculate dispersion from the same data.

CONCLUSION

When determining weapon or munition accuracy requirements or how to test for accuracy, it is important to understand not only how sample size, target and group breakout, and acceptance criteria affect the discrimination and risks inherent in any test, but also how selecting the right method to calculate target impact dispersion can affect discrimination and risk as well. This discussion has merely scratched the surface of these considerations. Armaments engineers and scientists need to address these issues in test and evaluation so that the warfighter doesn't have to deal with them in combat.

SSG DOUGLAS RAY (USA Ret.) is the lead Mathematical Statistician at the U.S. Army Research, Development, and Engineering Center, in the Statistical Methods and Analysis Group, part of the Quality Engineering and System Assurance Directorate's Reliability Management Branch at Picatinny Arsenal, NJ. He retired in 2010 from the Army National Guard, where he was an Airborne Infantryman. He holds a B.S. in applied mathematics from the University of Rhode Island and an M.S.E. in engineering science with a concentration in applied statistics from the New Jersey Institute of Technology. Ray is production, quality, and manufacturing Level III certified and is a U.S. Army Acquisition Corps member.

DOING MORE

WITHOUT MORE

A special section on achieving efficiencies and better buying power

A little over a year has passed since former Secretary of Defense Dr. Robert M. Gates directed the military departments, principal staff assistants, combatant commanders, and DOD agencies to "significantly improve the effectiveness and efficiency of our business operations," with the goal of increasing funding for mission functions. Specifically, the Efficiency Initiatives that Gates launched call for reductions in fiscal waste and elimination of redundancy to generate internal cost savings of more than $100 billion in five years.

Further guidance from Dr. Ashton B. Carter, Under Secretary of Defense for Acquisition, Technology, and Logistics, outlined five areas to address for possible efficiencies: affordability; incentives for productivity and innovation; promoting real competition; improving tradecraft in services acquisition; and reducing non-productive processes and bureaucracy.

What's actually been done to carry out Gates' and Carter's guidance? This special section on Better Buying Power addresses that question.

As Secretary of the Army John McHugh testified in May to the Senate Appropriations defense subcommittee, "We are developing a systematic approach to the Army's business processes that will ensure that innovative ideas and efficiencies influence future budgets. … We are building a foundation that will identify savings, manage strategic risks, maximize flexibility, and posture us even more effectively for the future."

Part of the effort is the Army Acquisition Review, which is expected to provide a blueprint for actions over the next two years that will improve efficiency and effectiveness.

Particular attention is also being paid to the diligent application of "will-cost/should-cost" analysis to acquisition programs, as outlined in Carter's memo *Implementation of Will-Cost and Should-Cost Management.*

This special section looks at the Army Acquisition Review; at how Heidi Shyu, Acting Assistant Secretary of the Army for Acquisition, Logistics, and Technology is calling on the AL&T Workforce to carry out should-cost/will-cost analysis; and at initiatives across the five areas of Carter's guidance, as discussed this spring at the Defense Acquisition Community Symposium. Finally, an article from Program Executive Office Simulation, Training, and Instrumentation takes a detailed look at the savings and efficiencies to be gained from a simple concept: teamwork.

ACQUISITION REVIEW

Army receives 76 blue-ribbon recommendations on making the process more effective and efficient

by Margaret C. Roth

The much-anticipated Army Acquisition Review hones in on the current processes for determining requirements, resourcing, and acquisition—"Big A" acquisition—and provides what the Army has said will be a blueprint for improvements over the next two years.

Officially called *Army Strong: Equipped, Trained and Ready—Final Report of the 2010 Army Acquisition Review Chartered by the Secretary of the Army*, the report makes 76 recommendations based on more than 100 interviews with present and past leaders in the Army, DOD, and the defense industry and analysis of numerous past acquisition studies. The six-member blue-ribbon review panel looked at the requirements process; the acquisition workforce; organizations; laws, policies, and regulations; funding; acquisition programs; key acquisition processes; and external relationships and oversight.

The panel's recommendations fall into four major categories:

- Make the requirements process collaborative and timely.
- Manage risk, in place of risk aversion.
- Align organizations and accountability.
- Provide adequate requirements and acquisition resources.

The panel was co-chaired by Gilbert F. Decker, the Army Acquisition Executive from 1994 to 1997, and GEN Louis C. Wagner Jr. (U.S. Army, Ret.), Commanding General (CG), U.S. Army Materiel Command (AMC) at his retirement in 1989.

The Army is adopting most of the recommendations in the review, Secretary of the Army John McHugh said in recent congressional testimony. "We have either implemented or are taking steps right now to implement all but 13 of the 76 recommendations. We're taking a more careful look at 13 of those," McHugh testified May 18 during a Senate Appropriations Defense Subcommittee hearing.

Subcommittee Chairman Daniel K. Inouye (D-HI), citing the review, noted that the Army had spent $3.3 billion to $3.8 billion each year since 2004 on programs that ultimately were canceled, a fact that McHugh called "revelatory."

RATHER THAN THE CURRENT, SEQUENTIAL APPROACH TO STAFFING AND APPROVING REQUIREMENTS, ACQUISITION, AND TESTING DOCUMENTS, THE ARMY ACQUISITION REVIEW RECOMMENDS A COLLABORATIVE PROCESS INVOLVING THE SAME HIGH-LEVEL PLAYERS AS NOW.

REQUIREMENTS PROCESS

Rather than the current, sequential approach to staffing and approving requirements, acquisition, and testing documents, the Army Acquisition Review recommends a collaborative process involving the same high-level players as now: the U.S. Army Training and Doctrine Command (TRADOC), AMC, Army Requirements Oversight Council, and Joint Requirements Oversight Council.

An Integrated Capabilities Development Team led by TRADOC and representing the Army Staff and Secretariat, U.S. Army Test and Evaluation Command (ATEC), AMC, and other Army commands would collaboratively develop requirements documents for most Army programs.

This new approach would not alter the tasks involved, but rather when they are performed. Current reviewers would become part of the development process, reducing the total time it takes, now 15 to 22 months. The panel faulted the current Joint Capabilities Integration and Development System process and recommended changing it to focus on the front end of the process, or abolishing it.

For key Acquisition Category (ACAT) I programs, the panel recommends establishing

a special task force, chartered by the Chief of Staff or Secretary of the Army and co-chaired by a TRADOC major general and an acquisition general officer or member of the Senior Executive Service.

The task force would include experienced representatives of the Army Secretariat and Staff, TRADOC, AMC, ATEC, and other Army commands; and, as appropriate, representatives of the Joint Chiefs of Staff; Director, Operational Test and Evaluation in the Office of the Secretary of Defense; and the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics.

It would collaboratively develop a comprehensive, consistent set of products to support milestone decisions and source selection, including Initial Capabilities Documents, Capability Development Documents, and requests for proposal (RFPs). The task force could also provide members to serve on the Source Selection Evaluation Board or Source Selection Advisory Council.

The panel also recommends institutionalizing rapid acquisition in policy guidelines and amending Army Regulation 71-9, *Materiel Requirements*, to support rapid acquisition in response to Operational

Needs Statements from combatant commanders during quiescent periods.

Finally, the panel recommends synchronizing TRADOC and Army requirements approval, Materiel Development Decision, Milestone (MS) A, and MS B actions to align with the Army's budget development schedules and thereby avoid a one-year delay.

In his Senate testimony, McHugh called uncontrolled requirements the number one problem in Army acquisition and the canceled Future Combat Systems (FCS) program "the poster child" for this problem. He said the Army is making progress toward a more measured, collaborative requirements process.

"We've tried to do a better job in stating the requirements, keeping them less reliant on immature or unavailable technologies," as witness the RFP for the Ground Combat Vehicle, which was re-released in November 2010 to reduce the top-tier requirements by 75 percent compared with the original RFP released in February 2010.

MANAGING RISK

The review panel recommends managing acquisition by program risk rather than by scope alone. It breaks acquisition

programs into five types, each with its own documentation requirements (see Figure 3), for greater efficiency and to restore discipline and accountability for product development. Following is a summary of the five types.

- Type 1: A non-developmental program, in which the capability need not start from scratch, but instead uses an Engineering Change Proposal. An example would be the AH-64 Block II Apache helicopter.
- Type 2: An existing system with a block improvement using approved requirements to avoid duplication, for example, the AH-64 Block III Apache.
- Type 3: A new system improving an existing capability with off-the-shelf technology upgrades, for example, the Stryker armored vehicle.

- Type 4: A new system that provides a new, innovative capability with proven technologies, for example, the Ground Combat Vehicle.
- Type 5: A new system for early adoption of as yet-incomplete technologies, for example, FCS. These pose the greatest challenge and should be restricted to game-changing military capabilities, the panel concluded.

By contrast, the panel recommended Types 1, 2, and 3 acquisitions for shorter cycles, rapid technology insertion, and reduced requirements and technology "creep." Priority should be given to vertical technology insertion and horizontal integration of proven advanced technologies, using evolutionary acquisitions with built-in growth capacity, the review states.

This varied approach to acquisition would enable the Army to get the requirement right and eliminate technology risk before MS B, according to the review, which recommends encouraging and funding competitive pre-MS B prototyping of systems, subsystems, and components. It also recommends expanding the acquisition of Technology Data Packages during the development stage, when the government has leverage.

The panel further recommends involving the cost, manpower and personnel integration, and test communities early in the acquisition process, and making greater use of fixed-price and incentive-fee contracts.

For improved oversight of industry advances in technology, the Army needs

Some Quotes from Interviews

Figure 1

WE NEED AN AGILE SYSTEM THAT RAPIDLY DEVELOPS, PURCHASES, AND FIELDS INNOVATIVE SOLUTIONS FOR OUR SOLDIERS…	SCHEDULE SHOULD BE THE FIRST PRIORITY WHEN RESPONDING TO THE IMMEDIATE NEEDS OF SOLDIERS IN COMBAT.	THE LIFE CYCLE MANAGEMENT COMMANDS HAVE BECOME 'BALKANIZED'!
WE NEED TO ENHANCE THE ROLE AND REPUTATION OF TCMS.	IN BUSINESS, AT THE END OF THE DAY, SPEED IS WHAT MATTERS.	TOO MANY PEOPLE CAN SAY NO.
THE JCIDS PROCESS WAS A GOOD FAITH EFFORT. WE CANNOT AFFORD THAT LONG OF A PROCESS IN THIS ERA.	FISCALLY CONSTRAIN DO&E…MAKE THEM PAY FOR TESTING OR RESTRAIN THEIR ABILITY TO SELECT ANY ITEM FOR TEST.	CONTRACTOR DASCS ARE TRULY WEAK… GET THE DASCS BACK INTO THE BUILDING!

Panel Members
Figure 2

GILBERT F. DECKER
CO-CHAIRMAN
– Former Assistant Secretary of the Army (Research, Development and Acquisition) and Army Acquisition Executive; Chair, Army Science Board; and Vice Chair, Board on Army Science and Technology

LOUIS C. WAGNER JR.
CO-CHAIRMAN
– General, U.S. Army (Ret.); former CG, U.S. Army Materiel Command (AMC); U.S. Army Deputy Chief of Staff (DCS) for Research, Development and Acquisition; and CG, U.S. Army Armor Center

WILLIAM H. FORSTER
– LTG, U.S. Army (Ret.); former Military Deputy to the Assistant Secretary of the Army (Research, Development and Acquisition); CG, U.S. Army Operational Test and Evaluation Command; and PEO Aviation

DAVID M. MADDOX
– General, U.S. Army (Ret.), former Commander in Chief, U.S. Army Europe; CG, U.S. Army Training and Doctrine Command (TRADOC) Analysis Command; and TRADOC DCS for Combat Developments

GEORGE T. SINGLEY III
– Former Principal Deputy Director, Defense Research and Engineering; Deputy Assistant Secretary of the Army (Research and Technology); and PEO Combat Support Aviation

GEORGE G. WILLIAMS
– Former PEO Missiles

to reestablish the difference between independent research and development (IRAD), and the bid and proposal process. Too many potential vendors are using IRAD to anticipate the next RFP, the panel found. The review also encourages the Army to increase its visibility into contractors' IRAD programs, using site reviews to exchange information, not just as a "grading exercise."

In the area of International Traffic in Arms Regulations, the panel recommends applying such restrictions only to "narrowly defined, high-value, militarily useful technologies, rather than subjecting readily available commercial products to these barriers."

ALIGNING ORGANIZATIONS
In its review of organizations and lines of accountability, the panel has high marks for Capability Portfolio Reviews (CPRs) and recommends codifying the way they are conducted in an Army regulation. The Vice Chief of Staff of the Army and Army Acquisition Executive should co-chair Session 1 of the materiel CPRs, the review states.

The panel has a number of recommendations for realigning specific organizations, including:

- Disestablishing the U.S. Army Research, Development, and Engineering Command, which the panel found has not reduced duplication as intended. Its command elements would return to the life-cycle management commands (LCMCs), and an Executive Director for Research, Development, and Acquisition would be named, reporting directly to the AMC commanding general. Laboratories and research, development, and engineering activities would be reviewed annually to eliminate low-value-added, duplicative efforts.

- Redesignating Program Executive Office (PEO) Soldier as PEO Soldier and Small Unit.
- Splitting up PEO Combat Support and Combat Service Support into two PEOs.
- Redesignating PEO Command, Control, and Communications-Tactical and Joint PEO Joint Tactical Radio System as PEO Mission Command.
- Redesignating PEO Integration as PEO Network.

The panel recommends refocusing LCMCs as the lead organization for fielding and post-fielding logistics. Program managers (PMs) would be the leads for acquisition logistics during development through successful fielding of an initial operational capability.

The review also looks at how Army leadership can improve communication with industry, such as through more frequent industry days. "Partnering" with industry could help solve issues short of formal protests, the review states.

ADEQUATE RESOURCES
A stronger workforce and more stable funding are the two areas where the review panel focused its recommendations for resourcing the requirements and acquisition processes.

More general officers should be assigned as PMs of complex ACAT I programs, the panel said. Also, the panel recommends that the Army select only PMs and program executive officers with expertise and experience in their product lines; and that it improve the qualifications of TRADOC capability managers (TCMs) by selecting a colonel-level TCM with appropriate operating force experience for each key ACAT I program.

In the area of professional training, U.S. Army Acquisition Corps (AAC) members should have the opportunity for full resident

Manage Acquisition By Program Risk Not Just Scope

Figure 3

Type	Description	Overall Risk [Tech-Integ-Program]	Acquisition Strategy	Contract Type	Requirement	Color of $	Approver	MDD - MS B	MS B - C	Maximum DoDI5000.2 Info Requirements
1	Existing system, NDI w/ ECPs for safety, RAM & LCC	Low [L-L-L]	ECP [AH-64D Blk II]	FP	CCB [Safety, RAM, Life-Cycle Sustainment]	Procurement	PM/PEO	~3-6 mos.	½ - 2 yrs	ECP w/ATP
2	Existing system, development w/ block improvement	Low - Mod [L-L-M]	2 Step [AH-64D Blk III]	FPIF or CPIF	I/CDD	RDT&E	PEO/SAE	1-2 yrs	1.5-3 yrs	TDS, STAR(U),AS, APB (U), CARD(U), SEP, TEMP, LCSP(U)
3	New system, to improve an existing capability w/produced tech & better engineering	Low -Mod [L-M-M]	2 Step [Stryker]	FPIF	I/CDD	RDT&E	ACAT II /IC= PEO/SAE ACAT ID = DAE	1-2 yrs	3-5 yrs	AoA, TDS, STAR, CARD, AS, APB, SEP, TEMP, LCSP
4	New system providing a new, innovative capability with developed, proven technologies	Mod [M-M-M]	Subsystem Proto + Dev [Javelin]	CPIF	I/CDD	RDT&E	ACAT II/IC = SAE ACAT ID = DAE	2-5 yrs	4-6 yrs	AoA, TDS, STAR, CARD, AS, APB, SEP, TEMP, LCSP
5	New system for early adoption of technologies yet to complete development	High [H-H-H]	System Proto + Dev [Crusader (LP)] [AAH]	CPIF	I/CDD	RDT&E	ACAT II/IC = SAE ACAT ID = DAE	4-8 yrs	4-6 yrs	AoA, TDS, STAR, CARD, AS, APB, SEP, TEMP, LCSP
RA	Rapid Acquisition		[CPOF]							
	J/ACTD	Mod-High	J/ACTD	Varies	ONS	6.3-6.7	PEO/SAE	~2-4 yrs	N/A	ACTDP
	REF	Low-Mod	Rapid Proc	FPIF	UONS	Proc/OMA		~3-18 mos	0	Varies
	RFI	Low	Rapid Proc	FPIF	JUONS	Proc/OMA		~3-6 mos	0	Varies

participation at the U.S. Army War College and U.S. Army Command and General Staff College, the review states. AAC members should also be able to gain experience and understanding of industry and high technology through assignment as PMs to the Defense Advanced Research Projects Agency, NASA, and national laboratories. In addition, potential PMs could gain valuable expertise through short assignments to staff positions in operational units.

To ensure adequate funding, the panel recommends:

- "Fencing" funds for up to six key ACAT I programs.
- Investing upfront in reducing Integrated Process and Product Development, and Operations and Support costs, to generate future savings for production and sustainment.
- Increasing the use of multi-year contracts on stable programs.

- Focusing development and production on what needs to be fielded to the operational force in the next seven years.

CONCLUSIONS

The review panel asserts that implementation of its recommendations will result in a highly skilled workforce with essential tools, processes, and effective organizational alignment; high-quality, resource-constrained requirements approved by the Pentagon within four months; and greatly reduced program cost overruns, slippages, and terminations.

The net result, the review states, will be "delivery of needed capabilities to warfighters in a more timely manner and paid for at a small fraction of the savings in lost sunk costs."

GEN Martin E. Dempsey, Chief of Staff of the Army, told the Senate Appropriations Defense Subcommittee May 18 that the Army's record of managing cost and schedule is good when it comes to smaller and rapid acquisition programs. "We actually have done well in ACAT II and III programs and some rapid adaptation and rapid equipment fielding."

The major problems, Dempsey said, have arisen with ACAT I programs that use the traditional DOD 5000 procurement process.

"The real challenge is to figure out why we do so well in some of these rapid acquisition procedures and not so well in the very deliberate DOD 5000 series of acquisitions," he said. The Army "should pull the future toward us and not have aspirations to deliver programs much beyond seven, eight, nine years. When they stretch beyond that, they become the definition of 'in-credible,' of lacking credibility."

The answer lies in a combination of the Army Acquisition Review's findings and in reexamining acquisition regulations, "particularly for the long-lead-time procurement programs," Dempsey said. "We've got to merge requirements and procurement and senior leadership integration much earlier in the process."

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'WILL COST / SHOULD COST'

Army eyes greater productivity in heightened scrutiny of weapons, acquisition programs

by Kris Osborn

The U.S. Army is working to implement guidance from Dr. Ashton B. Carter, Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)), which calls upon the services to drive productivity growth, maximize efficiency, and eliminate redundancy through an approach called "will cost/should cost" management, service officials said.

"Dr. Carter is challenging program managers [PMs] to drive productivity improvements into their programs during contract negotiation and program execution by conducting should-cost analysis, whereby every element of government and contractor costs is scrutinized," stated Heidi Shyu, Acting Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASAALT), in a June 10, 2011, Memorandum for Program Executive Officers.

The will-cost/should-cost approach is grounded in an effort to lower costs and improve affordability within acquisition programs by, in short, increasing scrutiny and targeting areas of potential cost reduction. Carter's guidance to the services (see memo on Page 81) stresses the need to reduce overhead costs where possible and to increase the measure of analysis given to programs.

THOROUGH SCRUTINY

"I will require the manager of each major program to conduct a Should-Cost analysis justifying each element of program cost and showing how it is improving year by year or meeting other relevant benchmarks for value," Carter wrote in a Sept. 14, 2010, *Memorandum for Acquisition Professionals* on *Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending.*

"Our managers should be driving productivity improvement in their programs. They should be scrutinizing every element of program cost, assessing whether each element can be reduced relative to the year before, challenging learning curves, dissecting overheads and indirect costs, and targeting cost reduction with profit incentive—in short, executing to what the program *should cost.*"

Each PM is now tasked with providing a "should-cost" estimate, designed as an

> " I WILL REQUIRE THE MANAGER OF EACH MAJOR PROGRAM TO CONDUCT A SHOULD-COST ANALYSIS JUSTIFYING EACH ELEMENT OF PROGRAM COST AND SHOWING HOW IT IS IMPROVING YEAR BY YEAR OR MEETING OTHER RELEVANT BENCHMARKS FOR VALUE. "

— Dr. Ashton B. Carter,
Under Secretary of Defense for Acquisition,
Technology, and Logistics

(U.S. Army photo by Todd Mozes.)

> **" BY JANUARY 1, 2012, ALL ACAT [ACQUISITION CATEGORY] I, II, AND III PROGRAMS WILL HAVE MILESTONE DECISION AUTHORITY-APPROVED SHOULD-COST EXECUTION TARGETS. "**

— *Heidi Shyu,*
Acting Assistant Secretary of the Army for Acquisition, Logistics, and Technology
(Photo by Christie's Photography.)

internal management tool for incentivizing performance. The "should-cost" estimate will then be compared and measured against the "will-cost" estimate, described as the official program position for budgeting, programming, and reporting.

DEADLINE SET

"By January 1, 2012, all ACAT [Acquisition Category] I, II, and III programs will have Milestone Decision Authority-approved should-cost execution targets," Shyu wrote.

The idea is to improve business practices and increase efficiency in contracting and acquisition program management. "Program managers must begin to drive leanness through should-cost management," Shyu stated.

PMs historically have argued that they could execute certain elements of a program for less cost, compared with independent cost estimates developed by outside organizations, said Cherie Smith, who directs ASAALT's Performance Assessment and Root Cause Analysis Directorate.

"It doesn't take a crystal ball to see that we are going to be expected to do more with less. Within the established financial boundaries, Ms. Shyu's goal is to incentivize our PMs by allowing them the ability to use these savings to lower risk in other areas of their program," Smith said.

Along with mandating affordability and establishing a should-cost management approach, additional elements of the Army effort to implement Carter's guidance include initiatives to eliminate redundancy within warfighter portfolios, make production rates more stable and economical, and set shorter timelines to manage programs.

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OFFICE OF THE SECRETARY OF DEFENSE
1000 DEFENSE PENTAGON
WASHINGTON, DC 20301-1000

APR 22 2011

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
                    CHAIRMAN OF THE JOINT CHIEFS OF STAFF
                    COMMANDERS OF THE COMBATANT COMMANDS
                    DIRECTOR, ADMINISTRATION AND MANAGEMENT
                    DIRECTORS OF THE DEFENSE AGENCIES
                    DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Joint Memorandum on Savings Related to "Should Cost"

      The purpose of this memorandum is to establish policy with regard to achieved savings as a result of successful "should-cost" program execution. At some point, Service Acquisition Executives will declare that program should-cost savings have been achieved (for example, the negotiated price of an annual production lot of a system is equal to or better than a should-cost program target). That assertion should be validated by the Service Assistant Secretary (Financial Management and Comptroller). Savings would then generally be retained by the Service and reallocated to the highest priority needs as determined by the Service Secretary or a senior leader designated by the Service Secretary.

      An exception to the aforementioned guidance would apply if the Secretary of Defense or appropriate designee determines that the savings are required to meet high-priority Department-wide needs, such as financial requirements generated by Joint Urgent Operational Needs. In that case, the savings would be diverted to these departmental requirements.

Ashton B. Carter
Under Secretary of Defense
(Acquisition, Technology and Logistics)

Robert F. Hale
Under Secretary of Defense
(Comptroller/Chief Financial Officer)

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

ACQUISITION,
TECHNOLOGY
AND LOGISTICS

APR 2 2 2011

MEMORANDUM FOR ACQUISITION AND LOGISTICS PROFESSIONALS

SUBJECT: Implementation of Will-Cost and Should-Cost Management

Last September, I directed the implementation of an internal management tool for all ACAT I, II, and III programs that I coined Will-Cost and Should-Cost Management. My goal for this initiative is to ensure that Program Managers drive productivity improvements into their programs during contract negotiations and throughout program execution including sustainment. It is essential that we eliminate cost overruns and begin to deliver programs below budget baselines that are set using independent Will-Cost estimates. I believe this is achievable if Program Managers continuously perform Should-Cost analysis that scrutinizes every element of government and contractor cost. This memorandum provides additional direction on the implementation of Will-Cost and Should-Cost Management.

Program Managers will develop, own, track, and report against Should-Cost estimates. In doing so, they should use all relevant resources within the Department to facilitate the development of program Should-Cost estimates (e.g., DCMA assisted overhead and program cost reviews). I expect Program Managers to provide program-level Should-Cost estimates for their ACAT I, II, and III programs as they are reviewed at major milestone decisions. The Defense Acquisition Board templates have recently been updated to reflect the type of information that is expected for Will-Cost and Should-Cost program estimates. In addition, I have directed the Services to each identify five programs to serve as models for Should-Cost implementation.

These programs will be used to communicate and demonstrate to other DoD offices and Congress the intent and advantages associated with managing to a Should-Cost estimate that is lower than the program budget. The delta between Should-Cost and Will-Cost will be managed consistently with the contract type(s) being used in the program. Once a firm-fixed-price contract is negotiated, any delta between budgeted amount and contracted price can be considered to have been "realized" and be reallocated consistent with statutory limitations and DoD/Service policies. For other types of contracts, funds generally can be reallocated after sufficient confidence has been established that contract performance will result in realized savings.

Service and Component Acquisition Executives should develop incentive plans for their Program Managers to reinforce and reward commitment to the Will-Cost and Should-Cost Management process. In addition, an annual report on Should-Cost progress is expected from each Service and Component. The first report is due to me on November 1, 2011. Progress reporting on the Should-Cost estimates will also be required for all Defense Acquisition Executive Summary reviews. Should-Cost estimates are not to be used for official program reporting, to set acquisition program baselines, or to set budgets. The Will-Cost estimate will continue to be the official position of the Department for use in budgeting, programming, setting acquisition program baselines, and for any other program reporting requirements external to the Department.

An essential ingredient of Should-Cost management is the provision of incentives for both of the parties to program execution: government managers, who seek more value for the warfighter and taxpayer; and industry managers, who develop, build and sustain our systems and provide needed services. The key is to seek and eliminate low-value-added ingredients of program cost and to reward appropriately those who succeed in doing this. For government managers, this means additional resources to enhance their programs (for example, by freeing up funds to buy more warfighting capability) and professional recognition. This will be part of how every Program Manager's and Program Executive Officer's performance will be evaluated. For industry, this means sharing in savings realized in the form of increased profit and enhanced corporate recognitions for delivering value to the government.

Service and Component Acquisition Executives, Program Executive Officers, and Program Managers should weigh the best method of meeting the intent of this initiative. Should-Cost estimates can be developed in any of three ways or in a combination. The first is through a bottoms-up estimate. Program offices do not need to form excessively large cross-functional teams to perform detailed bottoms-up assessments on *every* ACAT I, II, and III program. In some cases, however, this level of detailed analysis will be extremely beneficial and desired.

The second method is to identify reductions from "Will-Cost" estimates. At a minimum, I expect each Program Manager to determine specific discrete and measurable items or initiatives that can achieve savings against the Will-Cost estimate. These actionable items will be presented via the Should-Cost estimate and will be tracked and managed as part of Should-Cost estimate progress reporting. Arbitrary reductions and unsubstantiated high-risk goals against the Will-Cost estimate are not acceptable. Should-Cost estimates must be consistent with the defined program of record and have actionable content. Items that require significant up-front investment or significant change to the program of record (e.g., economic production rates) should not be presented in the Should-Cost estimate base, but should be highlighted in separate excursions for consideration by the Milestone Decision Authority.

A third method, where applicable, should use competitive contracting and contract negotiations to identify Should-Cost savings. In all cases, our contracts should reflect our efforts to manage to Should-Cost levels. This includes providing adequate savings sharing for industry to achieve Should-Cost levels that have been identified but not yet realized in incentive-type contracts and negotiating fixed-price contracts that reflect Should-Cost estimates.

Ashton S. Carter

Ashton B. Carter

Attachments:
1. Ingredients of Should-Cost Management
2. Will-Cost and Should-Cost Management Example Programs

ATTACHMENT 1

Ingredients of Should-Cost Management

1. Scrutinize each contributing ingredient of program cost and justify it. Why is it as reported or negotiated? What reasonable measures might reduce it?

2. Particularly challenge the basis for indirect costs in contractor proposals.

3. Track recent program cost, schedule, and performance trends and identify ways to reverse negative trend(s).

4. Benchmark against similar DoD programs and commercial analogues (where possible), and against other programs performed by the same contractor or in the same facilities.

5. Promote Supply Chain Management to encourage competition and incentivize cost performance at lower tiers.

6. Reconstruct the program (government and contractor) team to be more streamlined and efficient.

7. Identify opportunities to breakout Government-Furnished Equipment versus prime contractor-provided items.

8. Identify items or services contracted through a second or third party vehicle. Eliminate unnecessary pass-through costs by considering other contracting options.

9. In the area of test:

   a. Take full advantage of integrated Developmental and Operational Testing to reduce overall cost of testing;
   b. Integrate modeling and simulation into the test construct to reduce overall costs and ensure optimal use of National test facilities and ranges.

10. Identify an alternative technology/material that can potentially reduce development or life cycle costs for a program. Ensure the prime product contract includes the development of this technology/material at the right time.

ATTACHMENT 2

Will-Cost and Should-Cost Management
Example Programs

Air Force	Army	Navy
Joint Strike Fighter (F-35)	Joint Air Ground Missile (JAGM)	Joint Strike Fighter (F-35)
Global Hawk Blocks 30 & 40 (GH BLK 30 & 40)	Black Hawk (UH-60M)	Hawkeye (E-2D)
Space Based Infrared System (SBIRS)	Ground Combat Vehicle (GCV)	Presidential Helo (VXX)
Evolved Expendable Launch Vehicle (EELV)	Paladin Product Improvement (PIM)	Littoral Combat Ship (LCS)
Advanced Extremely High Frequency (AEHF) Satellite System	NETT Warrior	Ohio Replacement Program

COST MANAGEMENT MODEL
The Black Hawk UH-60M is one of the example programs under the new will-cost should-cost management. (Photo courtesy of Sikorsky Corp.)

CULTURE *SHIFT*

With efficiency initiatives in hand,
DOD acquisition community focuses on identifying,
implementing, and institutionalizing best practices

by Margaret C. Roth

KEYNOTE ADDRESS
Shay D. Assad, Director of the Defense Procurement and Acquisition Policy, addresses attendees at the 2011 DAU Acquisition Community Symposium April 12 at Fort Belvoir, VA. "There's a lot of money to be saved," Assad told participants. (Photo by Marques Chavez.)

On Sept. 14, 2010, Dr. Ashton B. Carter, Under Secretary of Defense for Acquisition, Technology & Logistics (AT&L) outlined 23 initiatives, with 137 actionable items in five major areas, whereby DOD could achieve the goal of "doing more without more." On April 12, about 1,000 members of the AT&L community and industry gathered at Fort Belvoir, VA, to discuss efficiency accomplishments to date and the path forward.

The Acquisition Community Symposium, sponsored by the Defense Acquisition University (DAU), framed the mission and challenges facing the AT&L community, as well as the tools and expertise at their disposal. "What we now need to take a look at is not acquisition reform; it's best practices … looking at the best of breed" over the past 30-plus years, said DAU President Katrina McFarland, who played a key role in developing the Better Buying Power initiatives under Carter before coming to DAU.

How and when to change fundamental acquisition procedures is a separate discussion, one centered on implementation of the Army Acquisition Review (see article on Page 73).

With DOD's budget expected to grow by about 1 percent a year and warfighting capabilities are expected to require about 3 percent increase in spending a year, there is intense scrutiny of AT&L practices across the department, whether in major weapons systems, spares, or sustainment services, said Shay D. Assad, Director of the Defense Procurement and Acquisition Policy.

"With your help, we are doing okay," Assad told the audience. "But we really need to step it up. We have really got to turn on our game. There's a lot of money to be saved, and we can never forget that these warfighters need and deserve the very best equipment as quickly as we can get it to them."

Christine H. Fox, Director of Cost Assessment and Program Evaluation (CAPE)

in the Office of the Secretary of Defense, noted that "we have a real need to recapitalize the force and to invest in our procurement accounts even though that [money is] going to be increasingly under pressure. … We have to continue to invest in winning the wars that we're in" and to prepare for a broad spectrum of threats ahead, which "ties up some flexibility in our ability to manage those [budget] declines," Fox said.

Most important, she said, "We need to talk about how to make [efficiency] a part of our fundamental culture"—with every decision, every day, to ask, "Is this the best thing I can do to make every dollar count?"

"We're about to enter a very complex period with a lot of challenges," Fox said.

WHAT'S GOOD ENOUGH?
Citing "the analytics of tough choices," Fox said one of the major challenges facing the AT&L community is "to be able

FICTITIOUS SUCCESSFUL AND UNSUCCESSFUL PROGRAMS

"This is a chart of what. This is not a chart of why," said Christine H. Fox, Director of CAPE, of these "stack charts," which identify where growth has occurred. With this information, program managers and cost analysts can "drill down and understand why."
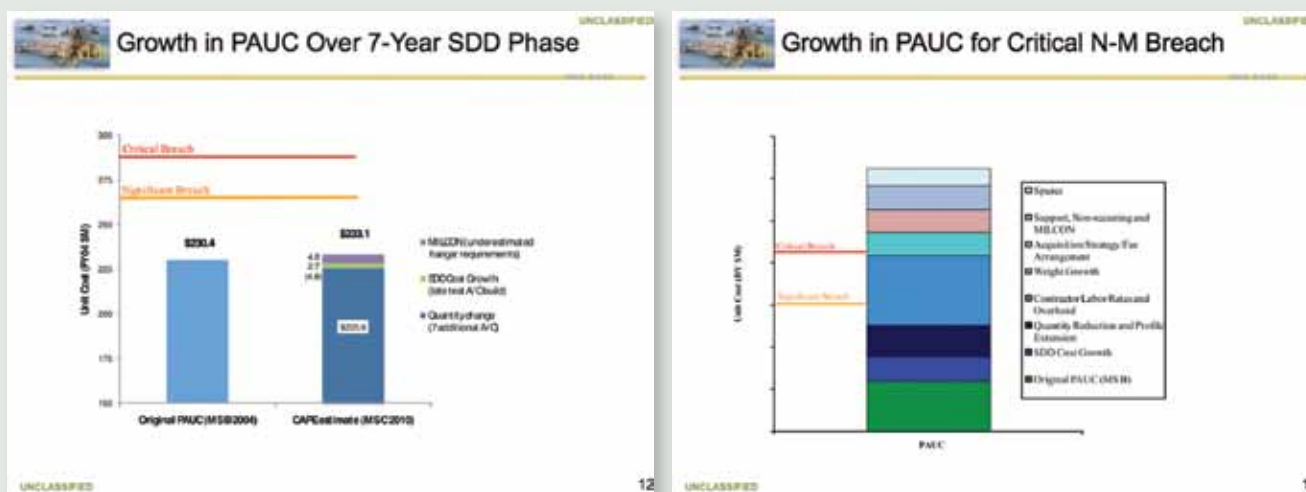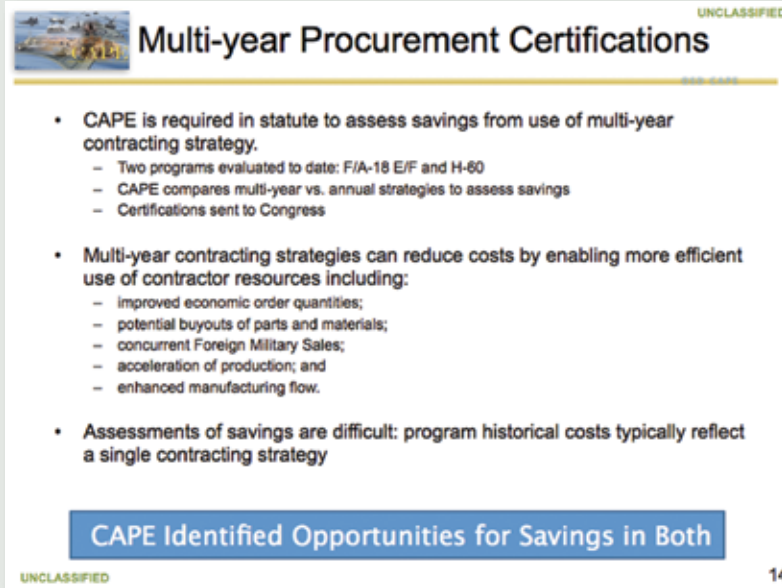
Figure 1

Figure 2

EFFICIENTLY USING CONTRACTOR RESOURCES

As illustrated here, multiyear contracts can help reduce costs by efficiently using contractor resources. CAPE is required by law to assess savings from this method.

to look our programs squarely in the eye and ask if we really need them. … What should we give up and when? … How do we know when to pull the plug?"

At the same time, she said, DOD still needs to invest in science and technology. We need "game changers," Fox said. "The question is where and when to invest," which makes better buying power all the more important and the involvement of program managers critical.

Determining what's good enough in capabilities "comes down to an assessment of risk," she said. "If we change the requirements, what risk are we accepting operationally? … What's the technological risk of something we want to do? … And then, of course, the cost risk: Can we really afford it?"

These decisions need to be made at the service level, Fox said. Noting former Secretary of Defense Dr. Robert M. Gates' decision to terminate the Future Combat

Systems program and to cut back a number of other military programs, Fox asked, "… shouldn't we be teeing up those decisions for the leadership to make before it gets to the Secretary's level, especially in a time when the costs and the budget are so constrained?"

This is a shared responsibility, she said, and the AT&L community needs more incentives to identify opportunities for savings and make wise decisions—not just stopgap solutions such as adjusting procurement quantity or buy rate, but decisions of fundamental affordability.

"If we really need a system, we ought to try to buy it as affordably as we can," Fox said. "And if we don't really need a system but we want it, and so we're going to keep it in there and stretch it, maybe that's one of the [times] that somebody should stand up and say, 'Maybe we should pull the plug on this system.'"

TOOLS AND TRADES

CAPE provides some tools to aid in affordability decisions by assessing the complete range of options and distinguishing critically important capability from "exquisite" capability, Fox said.

DOD has embraced the notion of Front End Assessments to provide information for the services' Program Objective Memorandums and the final program and budget review in the fall.

One such assessment last year, illustrating an analysis of "what's good enough," looked at the Long-Range Strike Family of Systems—the entire portfolio of conventional deep-strike capabilities— focusing on proven technologies to ensure that it could be delivered on time and on budget. The result was DOD's decision to invest in a penetrating, optionally manned, nuclear-capable bomber.

Also, the *Weapon Systems Acquisition Reform Act of 2009* gives CAPE the role of providing independent cost estimates

> " WE CAN NEVER FORGET THAT THESE WARFIGHTERS NEED AND DESERVE THE VERY BEST EQUIPMENT AS QUICKLY AS WE CAN GET IT TO THEM. "

and alternatives at Milestone A. "We think that this has a lot of promise to help us with this 'How much is enough' question," Fox said, acknowledging that it's not easy to do this rigorous analysis "when a system or a need is still a gleam in your eye."

"We [CAPE] need to be providing an assessment of the complete range of options to all of you, to the services and to the department's leadership … we really can't afford exquisite, going forward."

Fox also cited "stack charts" (See Figure 1 on Page 87) as a useful tool in identifying areas of program cost growth.

In addition, CAPE is required by law to assess savings from the use of multiyear contracting. Although a multiyear contract "ties your hands," it can reduce costs by enabling more efficient use of contractor resources (See Figure 2 on Page 88). "I think the opportunity to save money through these and come up with the required documentation to support them is very real," Fox said.

Finally, CAPE is working to give more impact to the Analysis of Alternatives (AoA) at Milestone A, Fox said. "I don't know that it has the impact that it needs to have. I think sometimes the AoA is a check in the box."

Better buying power is, above all, a team effort of program managers, acquisition executives, industry, and CAPE, Fox and senior acquisition executives agreed.

LEADERSHIP PERSPECTIVE
Fox offers senior leadership perspective on efficiency initiatives at the 2011 DAU Acquisition Community Symposium on April 12 at Fort Belvoir, VA. (Photo by Marques Chavez.)

MEASURING EFFICIENCY
The DAU is helping the services develop metrics to measure efficiency initiatives in the five major areas, according to DAU's Tom VandenBerg. (Photo courtesy of DAU.)

A shared understanding of challenges, incentives, and constraints is critical to making adjustments as needed.

"When we found cases where the program managers, the acquisition executives, our partners in industry, and the analysts in CAPE all worked together are the places where we've seen the most success in the programs going forward," Fox said. "It's not helpful if we give you an assessment of the cost without the understanding of the drivers behind the cost. It's not helpful if we give industry a bogey that puts them in an unsustainable situation, so that it's really just temporary."

FURTHER STUDY
DAU is helping the services develop metrics to measure efficiency initiatives in the five major areas, said Tom VandenBerg, who works in Major Defense Acquisition Program Engagement at the university. For example, in reducing bureaucracy, the measures are likely to be the reduction in the number of documents, the reduction of the number of reviews, and the speed of those reviews.

Separately, a study of organizational efficiencies is underway in the Army, focused especially on overlaps in logistics and sustainment. It assesses efficiencies to be gained within U.S. Army Materiel Command and the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (AL&T) in organizations, processes, and procedures.

Finally, CAPE is conducting a pilot study of the cost-analysis skills in the acquisition workforce, in conjunction with the U.S. Air Force (USAF). This census of the USAF analyst community looks at the organizations where the skills are (for example, in the service, program offices, and support contractors). The census is a first step toward determining what expertise exists across the services and DOD, and to develop the education and training to achieve the skills required.

*Presentations at the 2011 DAU Acquisition Community Symposium are at **https://acc. dau.mil/symposium11**.*

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PATHS TO SUCCESS

AL&T professionals share big-picture insights and program-level advice on the five principal areas of better buying power

by Margaret C. Roth, Kellyn D. Ritter, and Marques Chavez

TARGETING REDUNDANCY

The Army's first Capability Portfolio Review, on precision fires, resulted in the cancellation of the Non-Line-of-Sight Launch System (NLOS-LS) program. The NLOS-LS is shown here. (U.S. Army photo.)

By now, the Acquisition, Logistics, and Technology (AL&T) community is well aware of the detailed guidance from Dr. Ashton B. Carter, Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)), on providing incentives for greater efficiency, starting with in his June 28, 2010, Memorandum for Acquisition Professionals *Better Buying Power: Mandate for Restoring Affordability and Productivity in Defense Spending.*

At the Defense Acquisition University (DAU) Acquisition Community Symposium on April 12, practitioners of AL&T had an opportunity to better understand the genesis for Carter's guidance, and resulting steps taken, in five areas of action—targeting affordability and controlling cost growth; incentivizing productivity and innovation in industry; promoting real competition; improving tradecraft in services acquisition; and reducing nonproductive processes and bureaucracy.

Following is a detailed look at each of the five areas, as presented at the DAU symposium.

TARGETING AFFORDABILITY AND CONTROLLING COST GROWTH

Affordability is a straightforward concept, said David G. Ahern, Deputy Assistant Secretary of Defense, Portfolio Systems Acquisition. The difficulty lies in establishing the necessary discipline to achieve it in every program, so that DOD can develop budgets with a "steady, sustainable, and predictable rate of growth" and live within those budgets.

Ahern addressed five steps in Carter's guidance on affordability and controlling cost growth:

• Mandate affordability as a requirement. DOD is looking at affordability holistically, Ahern said. "We don't want to nail it down as a KPP [key performance parameter], as a JCIDS [Joint Capabilities Integration and Development System] sort of thing, but as an acquisition target." Beyond the range of individual cost factors, "we're looking for how that [cost] profile fits into the overall resources," specifically within that area of acquisition, be it ships, tanks, trucks, or aircraft, he said. "It is not only the unit [cost], but looking at how many units are going to be bought annually, how much RDT&E [research, development, test, and evaluation] is required, and how that fits into the ongoing TOA [Total Obligation Authority] of the service."

• Drive productivity growth through will-cost/should-cost management. Of the various program cost estimates to be considered, the will-cost figure is likely to be in line with the service's estimate or the independent cost estimate, if applicable, of the Director of Cost Assessment and Program Evaluation (CAPE) in the Office of the Secretary of Defense (OSD), Ahern said.

The will-cost estimate is "in the absence of some focused attention to do it better," he noted. In contrast, "What is required of the program managers to come up with a should-cost is not to say, 'If the will-cost is this profile, I'll just take 5 percent off, or 10 percent off it … and I'll figure out how to do it.' … To get the job done, we need specific opportunities in competition, in changing the configuration, in challenging requirements, in introducing subcontractor competition—some combination of those kinds of activities, with a rifle not a shotgun, to fill up a funnel of opportunities to reduce cost" in development, production, and/or sustainment.

The should-cost estimate will be the number against which the program is tracked, Ahern said. "There should be a delta in outyears between that should-cost and the will-cost. It can be quite significant in some years, and in some years it won't be that significant."

So what's going to happen to the savings? "We're going to have to figure out collaboratively, in the enterprise, what's the best approach to using that money," said Ahern, who is of the opinion that "it really belongs to the taxpayers," not the program manager or even the service. Making a program or product more affordable "is a worthwhile objective regardless" of where the money saved is spent, Ahern said. It may be used to buy more of the item, or be moved to another portfolio, or to the service or OSD to pay other bills. Who makes that decision will depend on how much money is involved and whether it falls in the current year or an outyear, he said.

• Eliminate redundancy within warfighter portfolios. Capability portfolio reviews, such as the Army has adopted, have proved to be a very useful tool by identifying overlaps, he said.

• Make production rates economical and hold them stable. With every production decision, particularly but not exclusively initial production, DOD has taken "a harder look at not the minimum sustaining rate, but the right rate of production," Ahern said. "There is a value to having the production line open for some period of time. But on the other hand, … I don't think a 20-year production makes much sense for almost anything," especially given rapidly evolving technology.

• Set shorter program timelines and manage to them. "The longer a program

COR BRIEFING

Contracting incentives are a large focus of the Better Buying Power Initiatives. Here, BG Tom Cosentino, Deputy Commander, Regional Support, NATO Training Mission-Afghanistan/Combined Security Transition Command-Afghanistan (left), receives an initial briefing from CPT David Dietz, the contracting officer's representative for Regional Support Command-Capital, before the flag-raising at Forward Operating Base (FOB) Deh Sabz in Kabul, Afghanistan, May 12. The ceremony marked the Afghan Army's full control of the FOB. (U.S. Army photo by Jon Connor.)

hangs around, particularly in EMD [Engineering and Manufacturing Development], the more likely it is to get into some kind of trouble," Ahern said. A long EMD phase is usually symptomatic "of a program that hasn't started with the maturest technology … has not focused enough on engineering and on integration of the various components of it." The time from "the decision to go," the Materiel Development Decision, and Milestone C, marking production and fielding, "needs to be as short as we can … I think that that A-to-B time, particularly in a competitive environment, … shouldn't be five years. It should be 18 months, two years, something along those lines."

INCENTIVIZING PRODUCTIVITY AND INNOVATION IN INDUSTRY

Sean Crean, Office of Small Business Programs, was the Task Force Team Leader charged with tackling the problems Carter saw in the incentives arena. At the DAU Symposium, he discussed the team's five specific initiatives and recommended directives that were approved by Carter and given to the services' Component Acquisition Executives for implementation.

- Aligning profit and fee with circumstance. "This was not a discussion about reducing profit," said Crean. Rather, Carter wanted to make sure everybody

understood that the issue was not to look at how profits are derived, but at, "How do I lower my costs? How do I incentivize industry to help me reduce what the costs are?" The task force concluded that the level of profit should be calculated to reward performance, and that the profit on subcontracted work should compensate for the burden of managing subcontractor risk and delivering subcontractor value.

"If we spend a hundred bucks for something, and the contractor's making $10, we'd rather spend $90 and let him make $12. But we don't want to spend $102 and let him make $12. We want to pay less," said Shay D. Assad,

Director of the Defense Procurement and Acquisition Policy. "If, in fact, we can incentivize the contractor to provide us products that cost us less, and he makes more doing it, that's okay … we're all for a healthy industrial base."

• Using proper contract type for development and procurement. "There were too many examples of 'I'm using a cost-reimbursable contract on this type of program because that's what has worked on similar types of programs over the years,' as opposed to 'Is this the *right* contract type?'" said Crean. The task force learned that contract type was an important way of aligning incentives for the government and the contractor.

The resulting directive was to increase the use of fixed-price-incentive, firm-target contracts where appropriate, using a 50/50 share line and a 120 percent ceiling as a point of departure. Crean stressed the importance of the word "appropriate" in the directive. "The one thing he [Carter] is trying to avoid is the perception of a mandate. What he's asking is for people to justify … their determination for using a particular type of contract," Crean said.

• Sharing the benefits of cash flow. Through their research and case analysis, the task force learned that the government is an exceptionally reliable customer in terms of financing—paying upfront and regularly, sometimes before products are delivered. DOD finances most industry investment needed to prepare products for the defense market, enabling the Department to offer a high cash flow return on invested capital. The task force concluded that DOD therefore should use innovative contract financing methods to incentivize vendors with the time value of money in exchange for lower prices.

The resulting directive was to adjust progress payments to reward performance.

• Rewarding excellent suppliers. "The basis of this [initiative] was, how can we recognize that we've got some contractors out there that are doing great jobs?" said Crean. The task force concentrated on the Navy's Superior Supplier Incentive Program. All benefits from the program are post-award, so preference is not given to organizations to win certain awards.

Carter directed that the Navy continue to lead the pilot but immediately include the other services and DOD components, ultimately transitioning to a full DOD program.

"It gives stockholders, purchasers an opportunity to look at that and say, 'Hey, there's a likelihood that person's going to be a repeat winner and have an opportunity to grow.'… to show industry what we care about—publicly," said DAU President Katrina McFarland, who previously played a key role in the Better Buying Power Initiatives under Carter.

• Protecting the technology base. After the task force learned that DOD reimburses industry as an allowable cost more than $3 billion annually in independent research and development (IRAD), with no insight into how or where these funds go, Carter directed DOD to align the purpose of IRAD to actual practice. He directed that the Director of Defense Research and Engineering (DDR&E) engage with the largest of the performers of IRAD to collect data on how they have used these funds in recent years. With this information, Carter directed DDR&E to provide a plan for a pilot program, to improve the return on IRAD investment for industry and government.

PROMOTING REAL COMPETITION

Robert M. Griffin Jr., Assistant Commander for Acquisition, Naval Facilities Engineering Command, which leads DOD in competition, headed the Task Force on Promoting Real Competition. "What was amazing to me was that we don't get the level of competition you would think we would," said Griffin. "What was more disturbing was when we went out in a 'competitive' environment, how often we only got one bid or one offer."

Studies have consistently concluded that competition drives down prices, Griffin said. Research by the Institute for Defense Analyses (*https://www.ida.org*) and others shows that the savings from true competition range from 5 to 25 percent, depending on what is being purchased.

Carter's Sept. 14, 2010, memorandum, *Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending*, calls on each agency's competition advocate to develop a plan to improve, at a minimum, overall competition by 2 percent per year (by moving from a sole-source environment to a competitive one); and effective competition by 10 percent per year (by reducing the number of single-offer competitions).

"We want to improve competition, the big number—all the stuff that historically was sole source under a J&A [justification and authority], plus all of the stuff that was 'competitive' but wasn't effectively competitive because we only got one bid," Griffin said. "By improving both, we'll save money.

"Ultimately, PEOs [program executive officers] and PMs [program managers] want the right thing," Griffin added. "If we make it easier for them to get

competition, if we make it easier for them to evaluate timely, multiple offers, they're going to go for it because they want to get the most for their money, too."

The task force developed a four-pronged approach to achieving greater competition:

• Remove obstacles. Carter directed that contracting officers conduct negotiations with all single-bid offerors unless the requirement is specifically waived by the Head of Contracting Activity, Secretary of the Military Department, or Director of the Defense Agency. "The goal is to make it so difficult for the contracting officer to go out and get one bid, that he or she will do anything they can to go out and get more than one bid," Griffin said. "We're going to punish them if they only get one, so they're going to make sure they get at least two."

For example, a Nov. 24, 2010, Defense Procurement and Acquisition policy memo states that if a solicitation is open for less than 30 days and only one offer is received, the agency must readvertise the solicitation for a minimum of 30 days. If the solicitation is open for at least 30 days or readvertisement yields a single offer, the agency must request certified cost and pricing data or other-than-certified cost and pricing data, and conduct negotiations.

• Require open-systems architecture and set rules for acquiring technical data rights. Carter's Nov. 3, 2010 memorandum, *Implementation Directive For Better Buying Power—Obtaining Greater Efficiency and Productivity in Defense Spending*, directed that a business case analysis, in concert with the engineering tradeoff analysis, be presented at Milestone B. The business case analysis is to outline the approach

to open-systems architecture and technical data rights that will be pursued. Analysis will be reported in the Acquisition Strategy Report and in the competition strategy, Griffin said.

The question of how to acquire technical data rights affordably also arose in a separate session at the symposium. Dr. Steven Miller, in the Office of OSD CAPE, said, "I think the most effective time to buy the data rights is when we do the competition," typically at Milestone B. "That's when we're likely to have the most leverage and control over the price."

• Present a competitive strategy at each milestone. While DOD recognizes that some major programs are not suitable for classic head-to-head competition, all programs should have a competitive strategy, Griffin said. Carter's Nov. 3 memorandum directed that a competitive strategy be included in the acquisition strategy before each milestone for Acquisition Category IC, ID, II, III, and IV programs. Agencies also report to USD(AT&L) on how they intend to reduce single-bid competitions, addressing market research, restrictive specifications, and adequate time for proposal preparation. Carter

INDUSTRY DAY

Carter has called for strategies to promote greater competition. Here, exhibitor Joe Bardouche (right), with Pi' Ilani, discusses opportunities for their business with another vendor (left) at the Hawaii Army Industry Day at the Hale Ikena Club on Fort Shafter, HI, Nov. 23. (U.S. Army photo by B. J. Weiner, U.S. Army Pacific Public Affairs.)

directed that all agencies achieve a 2 percent reduction in single-bid contracts in FY11, with continuing reductions thereafter.

- Increase the dynamic small business role in defense marketplace competition. Carter's Nov. 3 memorandum directs that all competitive and noncompetitive procurements seek to increase small business participation through weighting factors in past performance and in fee construct.

IMPROVING TRADECRAFT IN SERVICES ACQUISITION

DOD spends about $200 billion a year on services and about $178 million on weapon systems. It is taking an especially hard look at knowledge-based services, which include program management, logistics support, and systems engineering support, Assad said.

Not all of those contracts should be fixed-price, he said. "The reality is cost-type contracts might, in fact, be more effective. And right now … when you look at the three services, we have a very different approach in this world of knowledge-based services." The Navy uses almost exclusively cost-type contracts, Assad said; the Army typically has used time-and-materials contracts; and the Air Force used firm, fixed-price basis.

"So everybody's buying IT, and everybody's buying facility support services, and everybody's buying knowledge-based services, and everybody's buying it differently," Griffin said. That's why the Army and Navy recently appointed senior managers for services, similar to what the Air Force had already done.

The goal is that "everybody's speaking the same language on services, calling the same type of service the same way, looking at the spending information, looking

at the small business community's capabilities, looking at different geographical areas and what the market will give you in those areas, standardizing scopes of work … so that you guys don't have to start a proposal from Square One every single time you bid on something," Griffin said.

In the Army, "We're certainly looking for opportunities to consolidate" services contracts, said James C. Sutton, Deputy Assistant Secretary of the Army, Services. The review is looking horizontally across six portfolios, and vertically through commands. Metrics are also being developed for an annual review of services

REDUCING NONPRODUCTIVE PROCESSES AND BUREAUCRACY

Nicholas M. Torelli Jr., Director of Mission Assurance in the Office of the Deputy Assistant Secretary of Defense for Systems Engineering, served as a co-leader last year of the Acquisition Documentation Streamlining Task Force. The task force examined documents required to support all program milestone and major decision points.

On several occasions, he has asked members of industry to identify what

TRANSLATION SERVICES
Identifying best practices in contracting for services is a goal of the Better Buying Power Initiatives. Here, MG Abdul Ameer, the 12th Iraqi Army Division Commander, and COL Ryan Gonsalves, Commander of the 2nd Brigade Combat Team, 1st Cavalry Division, confer with the help of a translator at K-1, a military base in Kirkuk Province, Iraq. (U.S. Army photo by PFC Justin Naylor, 2nd Brigade Combat Team, 1st Cavalry Division Public Affairs.)

'THE BUILDING'

The processes by which acquisition decisions move through the Pentagon and Capitol Hill are being reexamined at all levels to identify and eliminate unproductive steps. (DOD photo by TSgt Andy Dunaway.)

government-imposed areas of cost they find unnecessary.

"They tell me everything we ask them to do is necessary. No, it's not," said Torelli, who spent 25 years in industry before coming back into the government. "There are bureaucratic things we put into place because something happened badly once.

"If we are serious about making these kinds of changes—and as you've heard, Mr. [Frank] Kendall [Principal Deputy Under Secretary of Defense for Acquisition, Technology, and Logistics], Carter, and the leadership are serious about these changes—let's identify what they are," Torelli said.

"We've come up with a streamlined, annotated outline. It's a prep guide so the program manager has something with which he can manage the program," he said. The documents cover acquisition strategy, the systems engineering plan, program protection plan, and life cycle sustainment plan. "We're going to do

some oversight, but we're delegating to the services significantly in places where we can, where Dr. Carter and Mr. Kendall think it's the right thing to do, and that's going to streamline your life."

Torelli also discussed working with Congress to eliminate low-value-added statutory requirements, reducing the volume and cost of internal congressional reports, and creating Defense Acquisition Board decision briefing templates—not "so we can take thought out of the equation," but "to make you think."

"There's an awful lot of what we do [in which] we're doing to put a check mark in a block because someone said they had to, when, in fact it may not be necessary."

Reducing nonproductive processes requires everyone's involvement, Assad said. "If you see something that doesn't make sense, stand up, talk about it."

DAU has a website devoted specifically to Better Buying Power, at **https://acc.dau.**

mil/bbp, organized by Carter's five areas of efficiency. Check it out for news, key documents, frequently asked questions with DOD-approved answers, and interactive discussions of best practices.

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THE EFFICIENCIES OF
TEAMWORK

by Kristen A. McCullough

THE BENEFITS OF HEAT

The HMMWV Egress Assistance Trainer (HEAT), pictured here, teaches Soldiers how to quickly and safely exit an overturned vehicle. Using the same construct and design platform as the HEAT, the MRAP Egress Assistance Trainer teaches Soldiers how to properly exit a rolled-over MRAP vehicle. Since April 2010, all warfighters, civilians, contractors, and foreign nationals have been required to train on the egress trainer before deploying to theater. (U.S. Army photo courtesy of Program Executive Office Simulation, Training and Instrumentation (PEO STRI).)

Even before organizations across the Army and DOD were asked to "do more without more," the U.S. Army Program Executive Office Simulation, Training, and Instrumentation (PEO STRI) was realizing savings through a simple yet multifaceted concept: teamwork.

"As you know, the Army is a 'we' organization, not a 'me' organization. PEO STRI is one element of the Army team working to ensure that our military is the best-trained fighting force in the world," said Dr. James Blake, the Program Executive Officer.

Working with other Army elements and with other military services toward a common goal has produced fiscal efficiencies through reduced manpower, elimination of duplicative efforts, and subsequent lower costs, Blake said. Different approaches to teamwork yield different benefits, yet all can lead to high-quality products for warfighters at demonstrably lower costs than if the products had been undertaken by PEO STRI alone.

ONE DESIGN, MANY USES
PEO STRI's Egress Assistance Trainer programs are key examples.

When PEO STRI received an Operational Needs Statement in July 2006 to procure a training device that could limit injuries sustained during vehicular rollovers, a joint effort was launched to rapidly develop the High-Mobility Multipurpose Wheeled Vehicle (HMMWV) Egress Assistance Trainer (HEAT), which instructs Soldiers in how to get out safely from an overturned vehicle. PEO STRI worked with PEO Combat Support and Combat Service Support, with engineering assistance from the U.S. Army Research, Development, and Engineering Command's Tank Automotive Research, Development, and Engineering Center, and manufacturing capability at Red River Army Depot, TX. As a result, the HEAT was developed in five months. It was deployed around the globe, including locations in the theaters of operation, by September 2007.

Using the construct and design premise for the HEAT, PEO STRI soon thereafter developed the Mine Resistant Ambush Protected (MRAP) Egress Assistance Trainer (MET) to teach Soldiers how to properly exit a rolled-over MRAP vehicle.

"By adding the design capabilities of the eight different MRAP vehicle cabs to the already proven HEAT system, the team provided a training capability in nine short months from concept development to the first fielding location at Camp Buehring, Kuwait," said Frank Schlemmer, Project Director for the HEAT and MET devices.

The HMMWV and MRAP egress trainers, both of which are Army solutions for Army problems, train not only Soldiers, but also warfighters from the other services who are getting ready to deploy to the combat zone.

"A U.S. Central Command message from April 17, 2010, requires all troops, civilians, contractors, and foreign nationals that are required to ride in an MRAP vehicle to go through the training drills on the MET," Schlemmer noted. In November, the trainers at Camp Buehring alone trained 100,000 service members before they deployed to Iraq. To date, each of the military services has MET devices. The Army has 47; the Air Force, 20; the Marine Corps, 18; and the Navy, 10.

"We know we are not in this alone. Just like our Soldiers are working hand in hand with their fellow Marines, Sailors, and Airmen in Iraq and Afghanistan, we in the simulation and training community—military, contractors, and academia alike—are one force supporting the strongest armed forces in the world," Blake said.

INDUSTRY PARTNERS
PEO STRI also works closely with those in the modeling and simulation industry to provide warfighters with the best possible training, in this era of budgetary constraints. Although government-industry

WORKING WITH OTHER ARMY ELEMENTS AND WITH OTHER MILITARY SERVICES TOWARD A COMMON GOAL HAS PRODUCED FISCAL EFFICIENCIES THROUGH REDUCED MANPOWER, ELIMINATION OF DUPLICATIVE EFFORTS, AND SUBSEQUENT LOWER COSTS.

SHARED TRAINING

Soldiers use PEO STRI's Intelligence Electronic Warfare Tactical Proficiency Trainer to practice their tactical questioning skills. The Department of Homeland Security (DHS) also uses this system to hone its law enforcement students' interviewing skills. By using PEO STRI's technology, DHS has saved time and money; the saved resources were used to create new scenarios to train Army and law enforcement personnel. (U.S. Army photos courtesy of PEO STRI.)

partnerships are not an efficiency in and of themselves, they have proven to be a wise way to do business.

For instance, PEO STRI, working with its industry partners, enhanced the Common Driver Trainer program to include the MRAP All-Terrain Vehicle (M-ATV). With guidance from the Department of the Army and expertise from industry, PEO STRI was able to field M-ATV driver trainers quickly and affordably. The M-ATV variant for the Common Driver Trainer allows Soldiers to drive these vehicles before they get to Afghanistan in hazardous driving conditions, such as narrow roadways and inclement weather.

"The M-ATV Common Driver Trainer was tasked to PEO STRI June 26, 2009, and we fielded the first system November 19, 2009," said Project Director MAJ Cassandra Forrester, noting that the turnaround from receiving the requirement to getting the trainer into the hands of the warfighter was a mere 147 days.

PEO STRI looks at the Common Driver Trainer program as a prime example of efficiency. Using common components, the simulator can be adapted to teach Soldiers how to drive Strykers, tanks, MRAPs, and other vehicles.

"The cost avoidance yielded by using the existing Common Driver Trainer design is valued at approximately $24.3 million," Forrester said.

Additionally, PEO STRI recently integrated the geo-specific terrain database for Afghanistan into the Common Driver Trainer program. Because of these efforts, Soldiers can virtually "drive" on actual streets in Afghanistan. Similarly, PEO STRI added the Afghanistan database to other simulators, such as the Close Combat Tactical Trainer, Call for Fire Trainer,

Advanced Gunnery Training System, Common Driver Trainer, and Aviation Combined Arms Tactical Trainer, thereby allowing Soldiers to virtually train in their actual assigned deployment locations. The imagery adds significantly to the fidelity of the training, at less expense than if the technology had not been reused.

GEOGRAPHIC EFFICIENCY

The ease with which PEO STRI collaborates with other organizations can often be attributed to its location in central Florida, a mecca for military modeling and simulation. As part of "Team Orlando," PEO STRI sits alongside all of the military services' primary simulation and training providers, academic institutions that focus on simulation, and industry partners that provide expertise to the military and universities.

PEO STRI LOOKS AT THE COMMON DRIVER TRAINER PROGRAM AS A PRIME EXAMPLE OF EFFICIENCY.

USING COMMON COMPONENTS, THE SIMULATOR CAN BE ADAPTED TO TEACH SOLDIERS HOW TO DRIVE STRYKERS, TANKS, MRAPS, AND OTHER VEHICLES.

This collaborative spirit dates to 1950, when the Army and Navy simulation components signed an agreement to work in partnership on training and simulation systems for service members. The signing of the document launched a lasting training partnership that is the longest-known standing agreement between any of the U.S. military services.

The strong relationship among the services continues to yield fiscal efficiencies. For example, PEO STRI signed an agreement with the Marine Corps' Program Manager Training Systems to work together on live training systems. When the Marine Corps saw that nearly 80 percent of its requirements were already being met by the Army through the Homestation Instrumentation Training System program, program managers piggybacked onto the Army's capability to get that training into the hands of Marines more quickly and save program dollars.

"The Marine Corps' estimated cost and schedule for building a new alternative system would be approximately $19 million and nine years," said Michael Dillon, the PEO STRI Project Director for the effort. The Marine Corps' actual cost of leveraging the Army's 80-percent solution was $8 million, and the time spent from concept

development to fielding was two years. Because of the time and money saved, the Marine Corps reimbursed the Army $300,000.

AGENCY COLLABORATION

Collaboration also produces interagency efficiencies. The U.S. Department of Homeland Security uses PEO STRI's Intelligence Electronic Warfare Tactical Proficiency Trainer to help law enforcement students with their interviewing skills. The technology reuse reduces the cost compared with a new but similar technology, as well as the high cost of hiring instructors and role players.

"The Department of Homeland Security realized cost benefits by reducing the number of instructor hours because the system is made available to students in a self-operated mode for after-hour use," said Rick Jimenez, Lead Engineer for the system. "Students practice basic interviewing skills in a virtual environment, which prepares them for a more productive engagement in front of live role players, thereby reducing the number of role-player hours required for training."

Using the savings from leveraging an existing contract and training capabilities, PEO STRI and the Department of Homeland Security generated scenarios and content for the system.

"The effort resulted in a quicker, more affordable production of training capabilities for our non-DOD customer," Jimenez noted. It also led to the creation of scenarios that are of use to Soldiers and "greatly enhanced the original product at a significantly reduced—and shared—cost."

Although partnership and teamwork do have their challenges—such as the time it takes to coordinate efforts, concerns about control, and the uncertainty at times that each party will uphold its end of the bargain—PEO STRI senior leaders and program managers agree that the rewards greatly outweigh the trials.

"When meeting the demands of our uniformed service members, we see an immense value in collaborating, coordinating, and cooperating with the joint community, our industry partners, and academia," Blake concluded. "Shared education and experience fosters expertise, and we use that expertise to provide efficiencies in the products and services we provide to our customers."

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MANAGING OBSOLESCENCE

of Rapidly Changing Network Technology

Critical Thinking, a new feature in *Army AL&T* Magazine, offers perspectives from those outside DOD and the defense industry on issues faced by the Army Acquisition, Logistics, and Technology community. Our intent is to provide fresh opinion and expertise on difficult challenges.

O*ur first Critical Thinking Q&A is with Dr. Peter Sandborn, a Professor in the Electronic Products and Systems Center at the University of Maryland's Center for Advanced Life Cycle Engineering. Sandborn's group develops obsolescence forecasting algorithms and performs strategic design refresh planning and lifetime buy quantity optimization. Sandborn is the developer of the Mitigation of Obsolescence Cost Analysis refresh planning tool, used by private and government organizations worldwide. He also performs research in several other life-cycle cost modeling areas, including maintenance planning, return on investment analysis, total cost of ownership of electronic parts, transition from tin-lead to lead-free electronics, and prognostics and health management for electronic systems.*

Sandborn has taught industry short courses on electronic systems cost modeling and obsolescence management. He is a regular presenter at conferences on Diminishing Manufacturing Sources and Material Shortages (DMSMS) and was a visiting fellow of the Royal Academy of Engineering in 2010. Sandborn has been the principal investigator on programs for the Army, Navy, and Air Force; the Defense Logistics Agency (DLA); Lockheed Martin Corp.; Northrop Grumman Corp.; Textron Inc.; Motorola Inc.; Ericsson; and the Naval Surface Warfare Center.

The author of more than 150 technical publications and several books, Sandborn has a B.S. in engineering physics from the University of Colorado, and an M.S. in electrical science and Ph.D. in electrical engineering from the University of Michigan.

Following are his thoughts on managing obsolescence.

Q. Does the same planned obsolescence that you have observed in the world of consumer electronics also apply to military network communications?

A. Yes and no. Planned obsolescence in the consumer electronics world is one of the primary causes of obsolescence of military systems. However, planned obsolescence of military systems can be an effective strategy for managing obsolescence.

In this case, planned obsolescence means that you plan, fund, and actually carry out periodic refreshes of the system hardware and software that, among other benefits, mitigate obsolescence by keeping you

better synchronized with the supply chain for critical parts.

While this is fine in principle, in practice it proves easier said than done. Changes in priorities, funding profiles, etc., regularly destroy plans for refreshes and often create unplanned life extensions of systems, so it is important to build quantitative support in the form of life-cycle cost and inventory management models that are agile enough to be updated as situations change.

Q. With all of the different products to be acquired for its tactical network, what does the Army need to do to mitigate obsolescence? What kind of coordination and prioritizing are required for a multilayered, multifaceted acquisition such as this?

A. Three key things have to happen to perform state-of-the-practice obsolescence management:

- Stay on top of things. Institute a process that allows real-time visibility of the "procurement health" of your systems. A simple metric that measures the fraction of your system(s) that you understand and are effectively managing from a supply chain point of view is a good tool to keep things on track. Problems occur when organizations lose an understanding of their parts; then, when they suddenly need more of the parts, panic takes over. We advise constructing a simple ratio of parts that are well understood, non-problems, or problems with solutions, to all parts that could be problems.

- Plan the life cycle. Think strategically. A few judiciously placed design refreshes can make the day-to-day reactive management of obsolescence problems much easier and more effective. But, to sell the refreshes means you

A COMPLEX EQUATION
GEN Robert W. Cone, Commanding General, Training and Doctrine Command, learns how Advanced Individual Training Soldiers use software to perform engine troubleshooting during a visit June 2 to the U.S. Army Combined Arms Support Command. (U.S. Army photo by Heather Van, U.S. Army Garrison Fort Lee, Visual Information.)

have to be able to build business cases, which is not trivial to do. Business cases should be built far enough in advance that they can influence your budgeting process; this means that the life-cycle planning has to be carried out years in advance. There is little value in building a business case that says you ought to redesign the system six months from now if the budget is fixed three years in advance and doesn't include funding for the redesign.

• Consolidate supply and demand. Chances are, if you need the part, someone else does as well. There may even be a third party who is going to throw the part away because they have too many or no longer need it. Solutions like DLA's Shared Data Warehouse are intended to facilitate visibility into common needs and inventory across all the services.

NETWORKING

Boeing Network Systems Engineer Jason Fair checks the software on an AH-64 Apache attack helicopter. (U.S. Army photo by Drew Hamilton.)

Q. How long does the process of planning for obsolescence take? Does it complicate the acquisition process or simplify it? Is this planning process worth risking a delay in implementation of the tactical network?

A. The most time-consuming portion of the strategic planning process is data gathering. Usually the appropriate data exists, but rarely is it all owned by the same person. This data includes: bills of materials that include manufacturer part numbers, part types, obsolescence status (obsolete or not), part prices, qualified alternative parts, existing lifetime buys if any, observed or predicted failure rates, etc.

The first time a program attempts to do strategic refresh planning, it could take months to pull together the necessary data, but after that it should be much quicker. In some cases, the necessary data resides with a subcontractor from whom

the "data package" was not acquired. When this happens, it can be a showstopper for strategic planning.

The cost avoidance associated with strategic planning to manage obsolescence can be significant; the planning can avoid or minimize the future unavailability of systems. Is it worth the risk of implementation delay? Hard to say. This is an application-specific issue that needs to be addressed when making a business case to perform strategic management.

Q. What is typically the weak link in obsolescence planning for an entire network? Where do you think the Army might be most vulnerable as it builds and acquires a tactical network?

A. There are several obsolescence management vulnerabilities in the ways that organizations build systems today. One common issue is understanding that obsolescence is not just a hardware issue;

it's also about software. In fact, lots of folks would gladly change hardware to fix a software bug if they could.

That is to say, software is a worse problem. Most hardware obsolescence events fall into the category of "weak" obsolescence events that allow continued system manufacturing and the operation of fielded systems with the obsolete part as long as you have an ample supply of the part available.

Many software obsolescence events are "strong" events, in which continued manufacturing of new systems and operation of fielded systems may not be allowed when the software becomes obsolete.

For example, the end of support for a commercial software package—one possible definition of software obsolescence—means the end of security patches, which may dictate that the software cannot be used within systems. Software

obsolescence may cause the effective obsolescence of hardware, and vice versa.

Another weak link that organizations have is their fundamental inability to make a business case for anything other than reactive management of obsolescence. A business case minimally requires that a cost avoidance be estimated, or better yet that an actual return on investment be estimated.

These require the ability to perform viable life-cycle cost modeling for the system, which is difficult.

Be careful: The commonly used cost avoidance accumulation method (via comparison to the "next most expensive resolution" used by many DMSMS management organizations to justify their existence)

produces a metric that indicates how hard an organization works, but it is generally not a valid life-cycle cost, and it won't sell strategic treatments of the problem.

Q. How does the need for interoperability with other services fit into this already complex equation?

A. One possible byproduct of this requirement is that there may be a larger set of common parts and assemblies between services. This increases the overall demand for parts to maintain the systems and means that the services could potentially consolidate supply and demand of the common system elements.

Q. What expertise can industry offer to keep the Army network from rapidly becoming obsolete?

A. Right now, the majority of commercial support for obsolescence (DMSMS) management is at the electronics "piece-part" level for standard parts, i.e., individual electronic parts such as integrated circuits that are not customized or modified. At this level, there are many commercial database tools that can provide obsolescence status, Restriction of Hazardous Substances (RoHS) compliance, and obsolescence risk forecasts. No such commercial database for obsolescence status or forecasting exists today at the commercial-off-the-shelf assembly level or for COTS software.

At the electronic piece-part level, commercial aftermarket suppliers and emulation solutions also exist. Emulation solutions mean production of legacy parts that are qualified by form, fit, and function to match the obsolete part, but are fabricated using newer technologies; needless to say, this is usually not an inexpensive solution.

Some electronic board-level aftermarket manufacturing and emulation also exist. Strategic planning support exists in the form of tools that perform life-cycle cost analysis of different sustainment strategies and can thereby optimize mixtures of reactive mitigation and strategic management activities.

Q. Does industry have any inherent incentive to keep the Army network from rapidly becoming obsolete, or does the Army need to create these incentives?

A. The mainstream electronics industry has little incentive to make things easier for the Army. The supply chain for electronic parts is driven by personal computers, cell phones, and other high-volume applications. Unfortunately, several global issues have recently conspired to complicate this issue in the shorter term: emergence from a worldwide economic recession and the earthquake in Japan.

TESTING PROGRAM SOFTWARE
Ron Mercatili, electronics engineer, validates software for the Miniature Airborne GPS Receiver Test Station. (U.S. Army photo by Steve Grzezdzinski.)

PUTTING THE PIECES TOGETHER
Kelvin Pressnell checks out a software program that allows a forward-looking infrared night vision system to work with a spotlight, both features of the UH-60M Black Hawk helicopter. (U.S Army photo by Kari Hawkins, U.S. Army Garrison Redstone.)

Right now, many electronic part suppliers either have not fully ramped up from production cutbacks made during the recession, or they are hindered by the supply chain disruptions in Japan. As a result there are allocation problems even for parts that are not obsolete; so low-volume customers, which include military customers, get to go to the "back of the line" for their parts. Some non-obsolete electronic parts are currently quoting 18- to 24-month lead times.

Q. What should the Army realistically expect in terms of how soon a refresh will be needed for the network?

A. Some parts—maybe a lot of parts—are going to be obsolete before the network is "switched" on for the first time. Determining when to refresh, or the optimum frequency of refresh, and what to refresh is application-specific, but it can be done.

Q. Is there anything else you'd like to add?

A. Other issues that arise include the management of nonstandard parts—parts that are modified or customized. It isn't even clear how to define the obsolescence date for these.

Conversion of systems to lead-free solder is another issue. The fact that Army systems are exempt from RoHS and RoHS-like legislation around the world that restricts the use of tin-lead solder is moot. You have to depend on a supply chain built to support a customer base that is for the most part not exempt; therefore, transitioning legacy systems to lead-free will be an issue.

Any solution for estimating life-cycle costs and optimizing the obsolescence management within a system has to account for uncertainties. The forecasted obsolescence dates are uncertain, demand for spares is uncertain, and the end-of-support dates are uncertain, so planning solutions need to be robust in the sense that they find strategies that put you in a good place even when the inputs to the problem change. **?**

COIN CONTRACTING

The strategic, operational, and tactical implications of the economic variable in counterinsurgency operations

by MAJ Christopher L. Center

AFGHAN JOINT VENTURE

Afghan Joint Venture uses the authority provided by Section 886 of the *National Defense Authorization Act for Fiscal Year 2008* as much as possible, if necessary employing joint-venture agreements to obtain the required level of expertise. (U.S. Army photos courtesy of Bagram Regional Contracting Center.)

BUILDING CAPACITY

To build technical capacity, responsible Afghan firms are awarded strategically important contracts, such as this concrete pad project on the Bagram Airfield.

It is well-known that technical training, joint ventures, and the creation of new businesses promote economic development. Not as well-known are the impacts that battlefield commanders and contracting officers have on the economic landscape. Economic improvements result from the proper use of "money as a weapon system" (MAAWS) in counterinsurgency (COIN) operations.

In the COIN plan, the economic variable should minimize damage to existing economic systems and act as a catalyst for expansion of the host nation's economy. Job training, joint ventures, and creation of new businesses frustrate an insurgency's recruitment efforts and decrease its influence on the local population.

Maximizing the influence of the economic variable requires long-term goals and tactical patience. The economic variable, similar to governance and security lines of effort, requires a great deal of training and time to develop. Afghan business practices are challenged in several areas, such as ethics, technical capability, and links to criminal patronage networks. Commanders must consider all of these factors when planning which efforts will promote full economic stability.

The International Security Assistance Force (ISAF) has provided four objectives to measure economic success in quantifiable terms: vendor vetting (buying from better people), elimination of barriers, contractor education, and employment rates. Within these objectives, the emphasis is on synchronizing the contracting mission with the commander's operational plan through proper oversight.

The intent is to prevent the infusion of large quantities of international funds that fuel corruption, finance insurgent organizations, strengthen criminal patronage networks, and undermine ISAF's campaign objectives. Specifically:

- Through vendor vetting, Regional Contracting Centers (RCCs) are mandated to do business with "better people." Vetting must occur through intelligence analysis and is supported by quantifiable data from the Joint Contingency Contracting System.
- By eliminating barriers to entry, Afghans are encouraged to start new businesses and broaden market opportunities. This can be measured by the number of new businesses opening and expansion of competition in the region.

- Contractor education, through corrective actions in the contracting process, such as issuing cure notices, can improve performance and ideally produce better vendors.
- Employment is the largest indicator of success, as measured by the number of jobs that COIN contracting produces.

These four objectives synchronize efforts by stakeholders in the warfighter and contingency contracting communities, enabling ISAF to nest the Afghan First (Section 886) program in COIN operations.

KEYS TO EMPOWERMENT

Warfighters at all levels must employ MAAWS to influence the economic variable. As GEN David H. Petraeus, Commander, ISAF and U.S. Forces Afghanistan, stated, "Money is my most important ammunition in this war."

Steven Metz, author of the article *New Challenges and Old Concepts: Understanding 21st Century Insurgency* (**http://www.carlisle.army.mil/usawc/parameters/Articles/07winter/metz.pdf**), stresses the importance of the economic variable and its inclusion in the overall COIN plan: "Economic assistance and job training are as important to counterinsurgency as

political reform. Businesses started and jobs created are as much 'indicators of success' as insurgents killed or intelligence provided." In *Operation Enduring Freedom*, these indicators of success provide stability, and Afghans gain confidence in their economic system and government.

The margins for economic activity tend to widen during conflict, Metz writes, and COIN contracting should attempt to make markets as competitive as possible. Economies that depend on exports of a single commodity or a few commodities are particularly vulnerable to protracted conflict, he notes; therefore, COIN operations need to include a plan for economic diversification.

"A comprehensive counterinsurgency strategy should offer alternative sources of identity and empowerment for the bored, disillusioned, and disempowered," Metz states. "Simply providing low-paying, low-status jobs or the opportunity to attend school is not enough."

CONTRACTING GUIDANCE

ISAF has disseminated COIN contracting guidance through the Afghan First program, which has significantly influenced contracting policy and its nonlethal impact on the battlefield in Afghanistan.

Local procurement makes good business sense from the buyer's perspective. Afghan firms know the market and often can provide goods and services of comparable quality at competitive prices. Local procurements are often the best way for the buyer to maximize value and provide timely delivery of needed goods, services, and construction projects.

Such business engagement broadens Afghan support for our mutual strategic objectives in Afghanistan, helping local businesses grow, gain experience, and

AWARDING CONTRACTS TO AFGHAN COMPANIES
If Afghan companies are identified as having the potential to perform but lacking technical expertise, contingency contracting officers can award contracts with the intent to engage and mentor companies by using joint ventures.

generate jobs in industrial, commercial, and agriculture sectors.

Contracting in COIN operations can enhance or be detrimental to long-term economic development. A detrimental effect comes from awarding contracts to only one contractor, creating a power broker in the area.

The promotion of economic growth in Afghanistan should be balanced with the proper vetting of local national contractors. Vetting provides the RCCs visibility of the subcontractor network through joint U.S. government task forces, which are chartered to analyze monetary actions and connections to networks that oppose economic stability in Afghanistan. With this information, the task forces can prevent criminal networks and insurgents from diverting money from its intended purpose.

U.S. Central Command (CENTCOM) Contracting Command and the *Federal Acquisition Regulation* provide clauses that enable the RCC to take action against prime contractors that hire subcontractors

with ties to the insurgency or criminal networks. If a subcontractor is exploiting the contracting process, the prime contractor must be held responsible.

The Bagram RCC has used tactics that are nested in the overall Afghan First program and subordinate operational objectives of its COIN Contracting Action Plan. Details of these tactics follow.

The **Afghans Building a Better Afghanistan** program identifies and uses building materials produced in Afghanistan for use in Commander's Emergency Response Program (CERP) projects. The intent is to create jobs and additional manufacturing possibilities within a 150-kilometer radius of Bagram Airfield. The advantages are the development of an industrial base and decrease in transportation costs. However, quality and availability of material are consistent issues that detract from the success of this program.

Afghan businesses that participate in the **Afghan Mentorship Program** and **Vendor Tournaments** are educated on the

AS A RESULT OF REDUCING THESE BARRIERS, BUYING FROM BETTER PEOPLE, HOLDING CONTRACTORS ACCOUNTABLE, AND THE CREATION OF JOBS IN AFGHANISTAN, **39,395 AFGHANS** WERE EMPLOYED ON U.S. GOVERNMENT CONTRACTS DURING [A] 3-MONTH PERIOD.

contract bidding process and are better prepared to conduct business with the U.S. government. These events occur in a non-threatening environment where potential vendors are able to ask questions in their native language. Participating vendors learn how to read and understand a Request for Quote or Request for Proposal, understand the requirement, how to submit coherent proposals, how timelines affect delivery, the importance of *Defense Base Act* insurance, and how to provide invoices and receive payments. These outreach efforts reduce barriers to market entry, promote competition, and develop responsible Afghan vendors who can compete for contracts at higher thresholds. They also decrease problems in the post-award phase of contracts, significantly reducing claims and disputes.

The **Joint Venture Program** uses the Afghan First program as much as possible, if necessary through the use of joint venture agreements to obtain the required level of expertise. Such agreements provide mentorship from more experienced firms. The Bagram RCC has experienced success with this program, as demonstrated by the award of a $50 million, multiple-award contract with two Afghan joint-ventured firms for a concrete pad. Joint ventures also allow Afghan companies to achieve documented past performance so they can compete for more complex contracts in the future.

Another endeavor, the **Craftsman Project**, assists trade and craftsmen laborers in establishing businesses vital to ISAF and NATO operational requirements, and provides opportunities to establish long-term financial stability to the economy of Afghanistan. The Craftsman Project is executed through partnering programs, agency assistance, and CERP projects. These partnering programs are intended to establish joint ventures between Afghan companies and third-country businesses. As an example, the Turkish firm 77 Construction Contracting and Trading Co. has taken the lead in partnering with many local Afghan contractors.

Agency assistance also augments this emerging tactic. The Department of State, U.S. Agency for International Development, and Peace Dividend Trust provide micro loans to businesses to help build responsible vendors.

COIN contracting in Afghanistan is making an impact and providing the latitude to execute direct awards to Afghan vendors in accordance with Section 886 of the *National Defense Authorization Act for Fiscal Year 2008*. Afghan First is enabling a dozen RCCs and their contingency contracting officers to reinvest money in their geographic areas of responsibility and thereby develop the economic variable of the COIN strategy.

From January to March 2011, actions by the Senior Contracting Official-Afghanistan RCCs to reduce barriers to market entry resulted in awards totaling $81.6 million to Afghan vendors. Barriers have also been reduced through the creation of new business and through mentorship programs, resulting in the award of U.S. government contracts to 25 new vendors.

As a result of reducing these barriers, buying from better people, holding contractors accountable, and the creation of jobs in Afghanistan, 39,395 Afghans were employed on U.S. government contracts during the same 3-month period.

Using money to support the theater commander's strategy in building economic lines of engagement remains an important nonlethal weapon that tips the center of gravity away from the insurgency.

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Lt Col Gregory S. Mazul, USAF, Chief, Bagram RCC, contributed to this article.

PARTNERS *in* CONTRACTING

Jointly manned centers demand proper training in cultural complexities

by CPT Michael Mignano

Contingency contracting officers (CCOs) are force multipliers worldwide, supporting Soldiers, Airmen, Sailors, and Marines in multifaceted operations ranging from counterinsurgency to disaster relief, by ensuring that critical resources and services flow uninterrupted. It is a complex responsibility.

In addition, many Army-operated contingency contracting offices are jointly manned and individually augmented. It is imperative that these augmenters quickly grasp not just the procedures, policies, laws, and regulations unique to their operating environments and the host nation, but also the Army's and Air Force's divergent assessment models, contracting jargon, operating instructions, and cultures. These distinctions present unique challenges and rewarding experiences for joint contracting center leaders, as well as their subordinates.

The Army currently assesses CCOs between their seventh and tenth years of service. New Army CCOs are required to complete additional advanced individual training and a one-year developmental assignment, and to obtain Defense Acquisition Workforce Improvement Act Level I certification in contracting before they conduct contingency contracting operations. This model is designed to ensure the well-roundedness and maturity of its leaders, but it is in stark contrast to the Air Force's approach to CCO development.

The Air Force accesses its CCOs immediately upon graduation from their basic airmen and officer basic courses, and then slowly immerses them in the contracting field. Before deployment, Air Force CCOs are required to complete advanced individual training, career development courses, and typically three years of varying job assignments. Because the Air Force accesses its CCOs so early, they are prepared to deploy as senior airmen and first lieutenants, in contrast to the Army's staff sergeants and senior captains.

WORKING TOGETHER

An Airman and Soldier work together during *Operation Joint Dawn*, a joint training exercise for contractors from Jan. 24 to Feb. 4, 2011. (Photo by Ed Worley, U.S. Army Contracting Command.)

RANK IS IMMATERIAL

Contracting authority and CCO warrant levels are not based upon rank; however, CCOs are warranted based on their education, experience, certification levels, and contracting knowledge. This system in which rank is immaterial often translates into an Air Force first lieutenant or staff sergeant having more contracting authority than his or her Army major supervisor, crisscrossing the lines between command authority and contracting authority.

Furthermore, while the *Federal Acquisition Regulation* offers a common contracting framework between services, the Army and Air Force each use their own jargon and operating procedures. When poorly managed, these factors create turbulence for Joint Contracting Command (JCC) leaders and their subordinates.

To combat these inherent challenges, COL William Sanders, 410th Contracting Support Brigade Commander, and Air Force Col Thomas Robinson, Air Education and Training Command Contracting Division Chief, took advantage of the new Fort Sam Houston, TX, joint basing initiative, in which dozens of Army and Air Force support functions in the San Antonio area are combining, by partnering their organizations in a garrison environment.

As a result of a formal memorandum of agreement signed in November, the 802nd and the 902nd Contracting Squadrons incorporated a four-person team from the 916th Contingency Contracting Battalion into their training programs.

BROADER UNDERSTANDING

"Being embedded with the Air Force has broadened my understanding of their internal structure and CCO development, and will be invaluable when we work together in a contingency environment,"

JOINT ENDEAVOR
Lt Col Eric Obergfell (foreground) gives guidance during an 802nd Contracting Squadron command and staff meeting. (Photo by TSgt Nicole Cleland, 802nd Contracting Squadron.)

said SSG Wesley D. Hilderbrand, 682nd Contingency Contracting Team, 916th Contingency Contracting Battalion.

"The senior noncommissioned officers and field-grade officers the Army is transitioning into contracting bring broad operational depth, which is valuable in training our junior officers and airmen, while we add value to [the Army CCOs] through our rigorous contracting training programs," said Air Force Lt Col Eric Obergfell, Commander, 802nd Contracting Squadron.

Not only have the teams from the 916th integrated into Air Force contracting operations, but they also participate in a wide variety of activities, including physical fitness programs, tactical field exercises, and social events. By fostering mutual trust and respect, this far-reaching relationship allows the CCOs from both services to share contracting knowledge and to better understand one another's culture. As this partnership matures, the 916th hopes to share opportunities with the 902nd and 802nd to participate in upcoming operational contracting missions in support of U.S.

Army South's humanitarian assistance and other requirements.

Since the program's inception, three of the 916th's CCOs have completed their development training with the Air Force; two have been slated for operational deployments where they can bring their experience and training to bear.

The joint initiative has shown that training CCOs between services can be done successfully and simultaneously benefit both organizations. As CCOs participate in similar training programs, they will gain the experience and tools to better serve as JCC leaders and subordinates.

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DOWNRANGE
COR

More than eyes and ears

by CPT Mark E. Ballantyne

ON THE FRONT LINES
LTC Wiley Blevins (left), Bamyan Embedded Training Team (ETT) leader, 86th Infantry Brigade Combat Team, and MAJ Timothy Drake, contracting officer's representative for the ETT, meet with the contractor hired to build new bathrooms for the Panjab, Afghanistan, provincial police station. (U.S. Army photo by SFC Peter Ferrell.)

The importance of a contracting officer's representative (COR) in the current theater of operations cannot be overemphasized. In Afghanistan, CORs are on the front lines of ensuring that the performance of DOD contracts is sufficient and to standard. This necessary yet underappreciated position is often described as "the eyes and ears of the contracting officer" (KO).

However, the position of a COR downrange entails many additional responsibilities that are often overlooked when a commander nominates a COR or assigns the responsibility to a Soldier as an additional duty. The sheer volume of requirements produced daily to support the full spectrum of combat operations in Afghanistan keeps most KOs in U.S. Central Command (CENTCOM) Contracting Command tied to their desks 12 to 14 hours a day, leaving little time for contract administration and oversight.

KOs lean heavily on the CORs to ensure that the expectations of the U.S. government are being met. CORs face numerous challenges in fulfilling these responsibilities, but these challenges can be organized and overcome with proper training and an awareness of local contractors' expectations.

THREE LEVELS OF COR EXPERIENCE

Deployed CORs typically fall into one of three categories: experienced, inexperienced, or extra duty.

The experienced COR is often a government employee or service member whose primary duty for the deployment is contractual support and/or technical expertise in regard to a specific requirement. Generally, an experienced COR is well-equipped for the job and adjusts quickly downrange. However, there are very few experienced CORs in theater, and those who do exist are typically assigned to specialized DOD programs.

While it would be ideal for every KO to have an experienced COR, it is far more common for an inexperienced or extra-duty COR to oversee a project. These CORs are assigned by their unit commanders for various reasons and come from all military occupational specialties and career fields. They tend to have limited or no COR or contracting experience, with any experience they do have coming from online courses taken before deploying or from a COR familiarization class at their pre-mobilization station.

While these programs have great value in indoctrinating a person to the philosophy and duties of a COR, they understandably do not prepare future CORs for many of the issues they will face downrange. Instead, the best preparation for a deploying COR would be to partner with a current or recent COR in theater. Together, they could identify areas of focus for dealing with Afghan contractors or KOs that may not otherwise have been considered.

Additionally, when CORs arrive in theater, they should shadow the COR they are replacing or one who works on a similar contract. Most military units are getting better at allowing their CORs time to work with their outgoing counterparts to learn about the contract and how to operate. Commanders must make this type of partnership a priority.

WORKING WITH AFGHAN FIRMS

Another challenge that downrange CORs face comes from the International Security Assistance Force's counterinsurgency guidance that, to the greatest extent possible, KOs meet mission contracting needs through the Afghan First policy by contracting with Afghan-owned firms. The intent of the policy is to have a direct impact on the Afghan economy by employing

RESOURCE MANAGEMENT
SFC Paul Carroll (left), Service Contracts Manager for the Directorate of Resource Management, 196th Maneuver Enhancement Brigade, South Dakota Army National Guard, and MSG Richard Albertson, a COR with the 196th, work with an Afghan contractor on forklift services and maintenance in Kabul, Afghanistan. (U.S. Army photo by CPT Anthony Deiss.)

DISCUSSING DEVELOPMENTS
Bagram RCC KOs MAJ Joel Dingle (center) and CPT Mark E. Ballantyne (right) and a coalition interpreter discuss the development of an Afghan National Army Combat Outpost in Kapisia Province, Afghanistan, with the President of Attayee Group, an Afghan firm contracted for the job. (Photo by SSG Eric Bailey, Bagram RCC.)

Afghans and developing their businesses to be sustainable enterprises while meeting DOD contracting requirements.

This means that KOs contract with less experienced or new Afghan firms, of which there are many.

The program has been very effective in creating jobs and moving money into the Afghan economy. The idea is that the more Afghans who are employed, the less incentive there will be for the general population to look to the Taliban for monetary support.

The indirect result of the Afghan First policy on CORs is a fundamental and inadvertent increase in their responsibilities and sphere of influence. In addition to being the eyes and ears of the contracting officer, the COR becomes the face of the U.S. government to the Afghan contractor. KOs downrange simply have too much work to keep up with monitoring all of their contracts and seldom have the time to visit a project or job site.

Essentially, the COR becomes the only link between the contractor and the KO. Therefore, the COR must have a full understanding of the contract, act as an expert in cross-cultural business, understand regional enterprise practices, and exercise extreme patience in contract surveillance.

This is particularly true in construction contracts. Most solicitations given to Afghans for bidding are written in English. Most of the contractors have the expertise to complete the projects, but may not have the language skills to interpret the contracts.

It has become common practice for Afghan contractors to hire a third-party business that understands DOD requirements to develop a proposal on their behalf.

A contractor may end up with a proposal that meets the technical criteria at the lowest price, but the Afghan employees do not understand the requirements beyond

what they need to build. Traditionally, Afghan firms adhere to a different methodology and less stringent quality and safety standards than U.S. companies.

The COR is expected to enforce quality and safety standards outlined in the Statement of Work or Performance Work Statement, and to exercise patience in guiding the contractor to adhere to standards. However, the lack of construction experience of many of the inexperienced and extra-duty CORs presents a dilemma. To resolve this, the COR must partner with the KO to assess areas in which they are weak, such as knowledge of plumbing, electricity, or structural integrity. The COR and KO can then create a plan of action for the appropriate engineers, safety inspectors, or tradesmen to accompany the COR on an inspection.

A successful contract requires that a COR have this reachback through the KO to coordinate with the appropriate personnel. This not only contributes to the safety of all the Afghan employees on-site, but also ensures a good product while developing the Afghan firm's knowledge and business capacity for future contracts.

THE CONTRACTOR'S PROBLEM SOLVER
In addition to becoming an expert in cross-cultural business, a COR also becomes the problem solver for the contractor. An Afghan contractor, unlike an American defense contractor, does not know how to navigate many of the potential issues when dealing with DOD.

For example, a COR may have to ensure that the Afghan contractor has proper access to project sites and is properly insured; that the contractor's employees are treated well; that all pertinent issues are brought to the attention of the KO;

THE COR MUST HAVE A FULL UNDERSTANDING OF THE CONTRACT, ACT AS AN EXPERT IN CROSS-CULTURAL BUSINESS, UNDERSTAND REGIONAL ENTERPRISE PRACTICES, AND EXERCISE EXTREME PATIENCE IN CONTRACT SURVEILLANCE.

and that the contractor is paid. The best way for a COR to deal with these types of problems is twofold: First, the COR must document all problems and solutions; second, the COR should actively engage and train the Afghan contractor when solving problems.

This requires a great deal of patience on the part of the COR; however, it allows the contractor to solve similar problems in the future.

Another COR responsibility is signing the DD Form 250, *Material Inspection and Receiving Report*, the document that accepts the products or services of the Afghan contractor on behalf of the U.S. government. A contractor cannot be paid unless the DD250 is signed, meaning that the COR is now also a source of payment, at least from the contractor's perspective.

Afghans do not always understand the role of the Defense Finance and Accounting Service (DFAS) and rely on the COR to ensure that they are paid properly and on time. Unfortunately, after the DD250 is signed and submitted to DFAS, it takes 30 to 45 days for the payment to reach the contractor's bank. This presents a major issue to contractors, as they often do not pay their employees until they are paid themselves; as a result, they make repeated inquiries to the COR about when they can expect payment.

This again highlights the necessity of a partnership among the COR, contractor, and KO; together, they can help the Afghans plan for payments and allow the contractor's business to run smoothly.

CHAIN-OF-COMMAND: ISSUES OF AUTHORITY

One of the biggest challenges that new or inexperienced CORs face downrange is balancing their authority as a COR appointed by a KO with the interests of their chain of command in a project or service.

All too often, there have been unauthorized commitments on contracts because ranking officers directed a contractor to do something that is not in the contract without the COR's knowledge, or tried to supersede the COR's authority. This is a particular issue with enlisted CORs on high-visibility contracts.

CORs therefore must "train" their chain of command in proper conduct when dealing with the contractors. Many high-ranking officers do not like the fact that the COR is authorized to interact with the contractor on contractual issues while they are not.

CORs must master the skill of respectfully ensuring that their authority is not confused with rank when dealing with people in their chain of command. To prevent confusion, leadership should attend the theater briefing that the COR receives from a Regional Contracting Center (RCC) before being appointed. Thus, the officers can learn about the RCC's expectations and how to be involved in a contract without overstepping their roles.

Navigating the legalistic world of DOD contracts is difficult enough for CORs. However, when they become CORs in a contingency area of operation, they have a vital impact on the local economy, counterinsurgency operations, and regional relations. Though they probably hold one of the most underappreciated jobs in Afghanistan, CORs are also among the most important people for mission success.

A professional partnership of the COR, contractor, and KO will allow even the most inexperienced CORs to complete their missions successfully and become seasoned CORs by the time they return from deployment.

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CROSSING OVER

Resurrecting legacy equipment to help Soldiers overcome nature's fury

by Rafik A. Quteibi

Soldiers cross the Helmand River in Afghanistan by fording their vehicles throughout the year. But when seasonal floods start, they are no longer able to ford their vehicles safely and continue their missions.

BRIDGING THE HELMAND
Soldiers of the 814th Multi-Role Bridge Company (MRBC) connect sections of the Improved Ribbon Bridge (IRB) to achieve a full closure of the Helmand River, providing military personnel with a main supply route. (U.S. Army photo by CPT Daren Wajdak, 814th MRBC.)

During the rainy months of February, March, and April, the Helmand River's normal crossing width of 330 feet can more than double to 836 feet; the depth and current also increase dramatically.

When fording is unsafe, Soldiers have relied on an Improved Ribbon Bridge (IRB) to raft vehicles and personnel safely across the river. Why raft a few vehicles at a time when the IRB could be connected to span the entire width (full closure) of the Helmand River?

A great idea, except that some type of anchorage is needed to hold the IRB in place so it does not float down the river.

The Bridge Erection Boat (BEB) serves two purposes: it positions the IRB bays to make a continuous float bridge and provides propulsion when IRB bays are used as a ferry, the latter of which was implemented at the Helmand River Crossing. The BEB can also anchor the IRB in place, with one BEB for every six IRB bays.

The problem with this scenario is that the 814th Multi-Role Bridge Company (MRBC) did not have enough BEBs. Furthermore, it did not have enough manpower to keep the BEBs in the water the entire time the IRB was needed.

Fortunately, an urgent request from the U.S. Army Corps of Engineers (USACE) Reachback Operations Center (UROC) found its way to the right mailbox.

GATHERING THE EXPERTS

When the Soldiers realized that their missions would be compromised because of raging waters, they contacted UROC for assistance. UROC in turn contacted the U.S. Army Tank Automotive Research, Development, and Engineering Center (TARDEC) Bridging Team (BT) in November. TARDEC BT members began working with the Soldiers, setting up weekly teleconferences that included:

- TARDEC
- Product Manager (PM) Bridging, within Program Executive Office Combat Support and Combat Service Support
- Materiel Fielding and Training (MFT) New Equipment Training (NET), within the U.S. Army TACOM Life Cycle Management Command (LCMC)

- U.S. Army Maneuver Support Center of Excellence (MSCoE)
- USACE Engineer Research and Development Center (ERDC)
- 864th Engineer Battalion
- 814th MRBC
- U.S. Navy 3rd Naval Construction Regiment

In brainstorming, TARDEC BT members discussed the pros and cons for several methods of anchoring the IRB and, after careful deliberation, determined that the legacy Overhead Cable System (OCS) was the best option due to the river's width, current velocity, bank heights on both shores, and depth.

IMPERFECT BUT WORKABLE

Several issues were understood when dealing with the OCS:

- Numerous system components were obsolete.
- Not all Soldiers were well-trained for the legacy OCS.
- Seasonal floods were nearing.

The TARDEC IRB Lead Engineer designed an OCS for the worst-case scenario, in light of the Helmand River's potentially unforgiving power.

Upon completing the design, the calculations were sent to the units in Afghanistan for their review, and to former bridge operators in MFT NET and MSCoE. Concerns were discussed regarding the river encroachment where the OCS towers were to be erected. With ERDC's assistance, an embankment platform was designed, putting the towers up and out of the way of the ever-widening river. TARDEC BT engineers suggested using all possible resources to keep the embankment dry by channeling the water away. When the design was finalized and agreed upon by all parties, it was time to move on to the next hurdle: resurrecting the OCS.

STAYING ABOVE WATER
814th MRBC Soldiers ready the tower of the OCS to be erected by the Bridging Team. The towers of the Overhead Cable System (OCS) help keep the main cables above the Helmand River. (U.S. Army photo by 1LT Dylan Benfield, 814th MRBC.)

PULLING TOGETHER
Soldiers of the 814th MRBC tighten the cables that help keep the OCS tower standing. (U.S. Army photo by 1LT Dylan Benfield, 814th MRBC.)

LEGACY EQUIPMENT

Discussions in December revealed that the Bridge Supplementary Set (BSS) that includes the OCS was missing some components critical to its installation and sustainment. Thus began a frenzied rush to locate components in the military system and to identify specifications for purchasing commercial-off-the-shelf parts for the missing and obsolete OCS components.

MFT NET made contact with all MRBCs in an attempt to locate missing components, but were able to locate only bridle connectors, which were found on a shelf in the Defense Supply Center Columbus, OH. Given the urgency, MFT NET in Troy, MI, immediately arranged to drive to Ohio and secure these crucial items. Most of the other components were either missing, damaged, or not in acceptable working condition.

While identifying specifications, the TARDEC IRB Lead Engineer noted that the BSS accommodated wire rope up to 1 inch in diameter. The agreed-upon design using 1¼-inch wire rope, which was recommended for this particular scenario by Military Float Bridging Equipment Training Circular No. 5-210,

dated December 1988, had to change quickly. The TARDEC IRB Lead Engineer conducted market research to locate a 1-inch diameter wire rope with the same or greater breaking strength than the 1¼-inch wire rope. A local company met this need and provided most of the other needed components with a quick turnaround.

With the missing components located, PM Bridging provided the funds to purchase them in an expedited manner, with delivery planned for February. OCS components left TACOM LCMC in Warren, MI, on Jan. 19, and were received in theater on Jan. 27, several days ahead of schedule.

TRAINED AND READY

The next issue to be addressed was training. MFT NET provided a detailed instructional presentation on erecting the OCS, along with lessons learned from their experience as enlisted Soldiers.

The embankments were skillfully constructed by the Soldiers based on ERDC's recommendation. The detailed design and instruction enabled the Soldiers to measure, build, and assemble the components needed for a complete IRB full closure of the Helmand River.

After the OCS was constructed, it was time to await Mother Nature. Seasonal flooding caused the river current to spike at 15 feet per second (fps) on Feb. 15-16, whereas the OCS was designed to hold up to 11 fps. The velocity dropped back down to an average of 7-8 fps for the next several weeks. The embankments stayed dry. The OCS had passed its first test of nature's power.

Then, on March 4, the OCS design endured its hardest test. The Helmand River was a merciless torrent of fast-moving water with the current reaching a record velocity of 18 fps. The OCS held all 29 IRB bays in place with the assistance of 10 BEBs and four vehicular anchor points.

With the OCS holding, Soldiers continue to use the IRB to safely cross the Helmand River, allowing missions to be completed year-round. While the OCS had long been dismissed and was hardly ever used by Soldiers, its performance and strength on the Helmand proved its utility once again.

RAFIK A. QUTEIBI is the TARDEC Lead Engineer for the IRB, Bridge Adapter Pallet, and Light Assault Gap Crossing Capability programs at TACOM LCMC in Warren, MI. He holds a B.A. in mechanical engineering from Kettering University (formerly General Motors Institute) and an M.S. in biomedical engineering from Wayne State University. Quteibi is Level III certified in systems planning, research, development, and engineering, and is a U.S. Army Acquisition Corps member.

Do you have a story to tell about a creative solution to a pressing problem? We'd like to hear from you. Write us at USAASCWeb-AR@conus.army.mil. Please include Field Expedient in the subject line.

FROM THE ARMY ACQUISITION EXECUTIVE
HEIDI SHYU

Setting the Conditions
FOR MISSION SUCCESS

It is a great privilege to be given the opportunity to lead the dedicated professionals of the Army Acquisition, Logistics, and Technology Workforce. We all recognize the solemn responsibility we have to equip and sustain the world's most capable, powerful, and respected Army. It is you, the military and civilians, who execute the policies that procure and field systems with the latest technologies that provide our Soldiers their decisive edge for current and future combat operations. In assuming the duties and responsibilities as the Acting Assistant Secretary of the Army (Acquisition, Logistics, and Technology), I want to reaffirm my commitment to the success of our efforts to equip Soldiers, which ultimately means the success of our Soldiers in every mission they undertake.

Under Dr. Malcolm Ross O'Neill's leadership, the Army acquisition community honored its paramount commitment to meet the needs of Soldiers in combat missions today. Dr. O'Neill reenergized the Army's efforts to develop advanced capabilities for tomorrow's conflicts. He reminded us that scientific and technical advancements play a critical role in maintaining the Army's unparalleled preeminence. His vision and strategy for Army AL&T will endure throughout my time in this role and far into the future. It has been my distinct and profound pleasure to serve under and work so closely with Dr. O'Neill.

As we move forward, I will continue to emphasize sound business practices, program management, and effective execution of major weapon systems while we help the Army to prioritize capabilities and modify existing programs to achieve long-term success. We will continue to play a critical role in bringing together the Army requirements, resourcing, testing, acquisition, and sustainment communities to make informed decisions on key programs. As the Army and Department of Defense continue to adapt during an era of limited resources, we will champion the importance of wise investments, competition, and sound acquisition strategies to ensure that the funds we execute on the warfighting capabilities for our Nation are timely and cost-effective.

The impacts of your daily actions are felt around the globe, in combat and other operations at home and abroad. Every time a Soldier departs a Forward Operating Base for a patrol, every time a Stryker rolls down the road, every time an Apache releases a rocket—all in defense of this Nation and our freedoms—it is because you, the AL&T Workforce, set the conditions for mission success. The materiel, the logistics, and the technology applications that you develop become the reality for the rest of the Army and ultimately global security. You are why we have the greatest Army in the world. A Soldier has a weapon because you designed it, tested it, and had it produced. A Stryker team can drive because you provided them with their vehicles. An Apache crew can engage the enemy because you provided them with that capability. In truth, we should not always measure the impact or importance of our efforts on the battlefield by our proximity to it; our work in AL&T engenders mission success.

As we move forward, there are going to be hard decisions. I think all of you realize the future resource environment will be challenging. We can expect that budgets are going to be tighter, which means we have to become a lot more efficient in the way we do business. We have to challenge and examine the processes and the procedures that hinder our productivity. We have to adopt more efficient organizations and business processes in this challenging environment. I ask for your help to look at everything that we're doing across acquisition, logistics, technology and sustainment. We must continuously explore ways to become more agile and more efficient in support of our Soldiers. We need to examine and leverage commercial best practices to transform how we execute our business.

I ask for your help and support as we move forward. In going about your daily work, focus on the Soldier, and execute with integrity, honor, and courage. These qualities are of critical importance to our success. The honor and integrity to do what is right for our programs and ultimately for our Soldiers must be held to the highest standards.

I look forward to working with you to ensure that our Soldiers have the decisive edge, and that we do all we can to keep our Army Strong!

FROM THE DIRECTOR,
ACQUISITION CAREER MANAGEMENT
LTG WILLIAM N. PHILLIPS

Growing the Acquisition Workforce to Meet
THE NEEDS OF THE FUTURE

No doubt you've been hearing a lot about efficiencies and budget restraint, and about "doing more without more." But you may not know that a few years before they were a key topic of discussion in Washington among senior leaders in DOD acquisition, the Army was well on its way to implementing a program that increases efficiencies. This program also continues to ensure that the needs of our warfighters on the battlefield are met, and that we will have a viable and effective acquisition workforce into the future.

Section 852 of the *National Defense Authorization Act for Fiscal Year 2008* directed the establishment of the Defense Acquisition Workforce Development Fund (DAWDF), which permits DOD to recruit, hire, train, and retain its acquisition workforce. On April 6, 2009, former Secretary of Defense Dr. Robert M. Gates directed an increase of 10,000 civilian personnel in the DOD-wide acquisition workforce by FY15. The DAWDF was identified as the catalyst to achieve this initiative, and the Section 852 program was born.

In 2009, the Army established a task force specifically to scope out the details of growing the acquisition workforce, and before deploying to Iraq, I was honored to help establish the task force effort in support of Mr. Dean G. Popps and LTG N. Ross Thompson III.

The task force asked Army commands and organizations with acquisition positions to list their hiring requirements. The information was used to finalize a strategic approach for meeting the Secretary of Defense's initiative. After the gathering of information was complete, the task force put in place the requirements by fiscal year and career field designation.

The Army is responsible for increasing its acquisition workforce by 1,885 new hires by FY15, with 1,650 of the positions reserved specifically for the contracting acquisition career field. Most of these new hires are interns and journeymen. In FY09, we added 550 new hires; in FY10, 551; and to date, we've fulfilled a total of more than 1,370 new hires. As you can see, we are well on our way to reaching the goal of 1,885.

Recruitment and hiring are highly specialized. Because the leaders of the individual organizations and commands know their needs best, they are tasked with hiring the new interns and journeymen to meet their specific needs. It is a decentralized process designed to find the people with the proper skills and experience.

When I testified on April 5 before the Senate Armed Services Subcommittee on Airland, a portion of my testimony was dedicated to this program and the caliber of our new hires. I reiterated to the members of the committee that we are looking at candidates coming out of colleges and universities who have the skills necessary to train in specific areas of expertise. With the Army's high standards for recruiting and hiring interns today, we are finding candidates with incredible talent who, on average, have a GPA of 3.5 or higher.

The acquisition intern program is a two-year program that mimics the Army's intern program for non-acquisition fields. Section 852 provides the funding for us to train these interns for the entire length of the program. It even provides funding for a third year if necessary. We are developing in these talented and motivated interns the proper specialized skills and experience for FY15 and beyond. We want to ensure we are cost-effective in our acquisition programs, building the right systems and saving the taxpayers' money. Let me add that we are incredibly proud of our new teammates coming into the Acquisition Corps, especially the energy and skill that they bring.

While we are executing our plan to grow the workforce, we have concept plans for placement of these new hires in the future. The Army, along with DOD, has proven itself to be proactive. Thanks to the implementation of this requirement identified by leadership in 2009, the acquisition workforce stands ready to meet future objectives. We are doing the right things at the right time.

For more information on Section 852 hiring initiatives, please visit **http://asc.army.mil/career/programs/852/default.cfm**.

LETTERS to the EDITOR

Would you like to comment on an article that has appeared in *Army AL&T* Magazine?
Do you have information you would like to add on a published topic? Is there a trend or
other development that you'd like to bring to our attention? Send us a Letter to the Editor.

Small Units Need Unmanned Aircraft

I'm not normally associated with Army aviation. I've only had brief correspondence with respective leaders and DOD civilians within the unmanned aircraft systems sector. I have no input as to the acquisition of UAS or contracts.

I serve as an Infantryman, and I can express my frustration when we did not have the assets that we needed with regard to UAS platforms. I have 15 years in active-duty Army service. I have been deployed to Iraq twice. While conducting combat patrols, I very much appreciated the use of helicopter and UAS air support. The Army has attempted to field platoon-level UAS aircraft, yet most platoons still operate without internal UAS.

We have the Raven, but when I was deployed, I could not sign for one. Commanders do not want to be responsible for loss of any platform even though it was designed to be a "throwaway" system.

Change will need to happen on two fronts: First, the military needs to loosen up a bit with regard to losing an unmanned aerial vehicle. If we are given a tactical advantage over the enemy, loss of a UAV should be acceptable.

There are concerns about sensitive electronic hardware falling into enemy hands. This is one of the biggest concerns for most in the military, so to that end, some sort of self-destruct device needs to be incorporated.

UAS systems for the platoon and squad need to be simple. Full collective helicopters, radio-controlled and otherwise, require flight control manipulation to correct the angular difference between retreating and advancing blades when maneuvering from a hover into lateral flight, i.e., cyclic left, increase collective pitch, increase throttle, and, finally, increase tail rotor pitch to maintain yaw and heading. That's a lot for just "moving left."

Controls need to be simplified. I need to take the least knowledgeable private with the least experience and put a UAS system in his hands, teach him the operation, and stand back to watch him successfully employ the system to the advantage of his platoon.

Second, respective industries need to fabricate systems in a less expensive manner: durable, simple, but cost-effective to produce. It can be done. Sadly, a number of those in the industry are looking for the big slice of "government pie," which results in platforms that commanders end up not wanting to issue out because they're expensive.

I know for a fact that I can go into a hobby shop that carries a large inventory of radio-controlled helicopter parts, and I can build a cheaper, yet reliable, UAS system. The UAS industry needs to band together, just as the helicopter industry did in 2010 with the Vertical Lift Consortium.

We are a Nation that has been involved in continuous conflict and operations since 2001. Enough time has passed for UAS platforms to be designed, tested, fielded, and implemented down to the lowest level. Fear of losing a UAS should never outweigh the tactical advantage over any insurgency or the preservation of life. Cost should never be a consideration when those lives include our Soldiers.

SSG DAVID A. HICKMAN
C Company, 2nd Battalion,
11th Infantry Regiment
Fort Benning, GA

Acquisition, Logistics, and Technology Community Must Review Information Sharing

Your article titled "When One Software Language Doesn't Fit All, Translator Technology Provides a Solution" (April-June 2011 *Army AL&T* Magazine) raises an important issue for the acquisition community. Tools provided from the top are desperately needed to enable open collaboration of complete program goals throughout all phases of an acquisition program—tools that are secure but have a short learning curve, maintain auditable records, and track communication, crucial information, goals, assignments, and accomplishments of all stakeholders, but specifically the Integrated Product Team.

The solution described in the article, Semantic Mediation for Army Reasoning and Teamwork (SMART), allows systems to share more information faster and reduces the cost compared with custom translation. Product Director Common Software, assigned to Project Manager Battle Command in the Army's Program Executive Office Command, Control, and Communications-Tactical, has adopted the SMART architecture as its software mediation and interoperability infrastructure.

The Army AL&T community is pledged to "work with our partners to develop, acquire, deliver, and sustain weapons systems and capabilities to our Soldiers. We must collaborate to ensure the Soldier is equipped quickly with the right product.

We must work closely with our partners to continually improve Army capabilities and to ensure their interoperability," as stated in the credo of the Office of the Assistant Secretary of the Army for AL&T at **https://www.alt.army.mil/portal/page/portal/oasaalt**.

It seems like a very good idea for all stakeholders to be able to go to one place and get the whole story about a program—sort of a road map of the original program and all the different paths it took to get where we are. That would remain *the* source of where we are headed, how that trip will be implemented, who are the stakeholders, what they have to do, and what they did or delivered. This would apply to any materiel solutions to an identified Army requirement, Operational Needs Statement, or Urgent Materiel Release.

The project manager is responsible for lifecycle management, in which programs go through several phases, primarily research and development, procurement, production, sustainment, reset, and demil.

Strategy, planning, execution, and reporting of each consists of overwhelming responsibilities of many people in many places. Libraries could be filled with documentation, assignments, deliverables, and accomplishments even if everything went according to the initial plan. (It never does.)

Currently most of the management and oversight is done through email or telephone contacts. Volumes of information are duplicated and stored in disparate systems. I normally read the same information three or four times as the information is shared. It is very hard to find critical information in a timely manner after it has been stored.

I see a top-down system like MilBook being recognized as a whiteboard that all stakeholders can use to access, update, and input valuable information one time to all, instead of the few. That information would then be redistributed within the email system. Some standards could be input, and individuality could be fostered where needed. This system would then be a repository for recording auditable records and required deliverable documentation.

THOMAS J. PERKINS, CDFM
Program Analyst
Project Manager Soldier Weapons
Program Executive Office Soldier
Picatinny Arsenal, NJ

Letters should be kept to 500 words if possible and will be edited for style and space. Please include your name, title, organization, and daytime contact information so that we can verify your letter. Send letters by postal mail or email to: Letters to the Editor, Army AL&T Magazine, 9900 Belvoir Rd, Fort Belvoir, VA 22060-5567. Email: USAASCWEBArmyALTMagazineLettertoEditor@conus.army.mil

FROM THE DIRECTOR,
U.S. ARMY ACQUISITION SUPPORT CENTER

WHY SECTION 852?

Craig A. Spisak
Director, U.S. Army
Acquisition Support Center

During the 1990s and the early 2000s, the acquisition community was specifically targeted for reductions. Some members of Congress said that "there were too many buyers and too many shoppers" in the acquisition community. DOD, through previous *National Defense Authorization Acts* (*NDAAs*), had specific targets for reduction in acquisition organizations and the acquisition workforce itself. These occurred without a commensurate reduction in workload.

Over the years, the pendulum started to swing back. The number of acquisition workforce personnel decreased while workload and total obligation authority increased (See Figure 1). In 2007, the *Gansler Commission Report* on the state of Army acquisition highlighted several areas that were broken in Army contracting. So as we've grown, we have specifically targeted some of those challenges in the contracting arena. We've tried to lay out a plan for achieving workforce growth. We have taken a very strategic look at skill set gaps in the Army Acquisition, Logistics, and Technology Workforce and set priorities for those gaps, in a targeted approach to acquisition workforce growth and development.

Congress recognized this trend and included the Defense Acquisition Workforce Fund in Section 852 of the *NDAA* for FY08, which allowed DOD to recruit, hire, and train the acquisition workforce. On April 6, 2009, the Secretary of Defense announced the Defense Acquisition Workforce Growth Initiative, with a

target of increasing new acquisition hires by 10,000 by FY15. The Army's new-hire target was set at 1,885, with 1,650 of the positions reserved for the contracting career field.

If you look at these changes in concert with operations in theater, DOD has received a lot more Overseas Contingency Operations (OCO) dollars, which has substantially increased the Army AL&T workload. We've had to ramp up dramatically to meet the OCO requirement and our workforce's increasing responsibilities. Programs and OCO dollars have increased for those reasons, and the Secretary of Defense targets for workforce growth have had to increase. From my perspective, the Acquisition Workforce Growth Initiative was woefully overdue and critically needed to resolve the imbalance between the challenging workload and the number of people in the workforce.

The Army's goal is not only to increase the workforce, but also to bring in the right kinds of people, with the right types of skills to perform the functions that are necessary. In a Senate hearing April 5, Director of Acquisition Career Management LTG William N. Phillips answered questions on the quality of interns that the Army was recruiting into the acquisition workforce.

"We are actually looking at folks coming out of colleges and universities that have skills that are necessary to bring them in and train them in cost analysis and areas such as that. … Matter of

DOD Acquisition Trends
Set the Tone for the Acquisition Workload

Figure 1
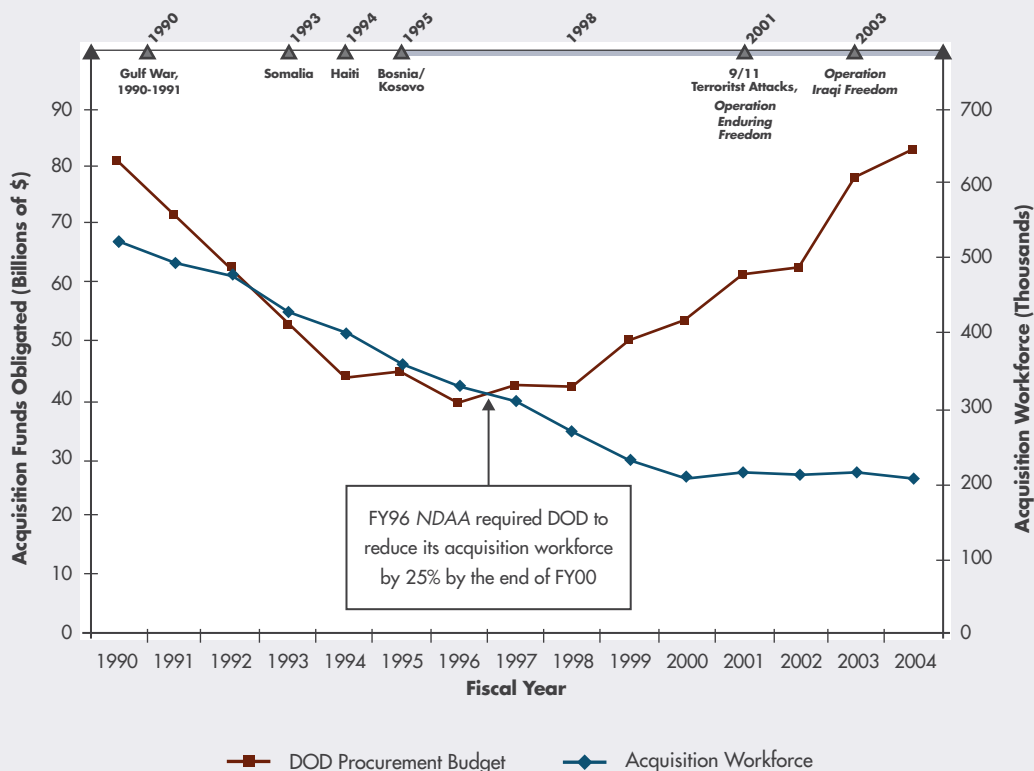
SOURCE (Workforce Data):
DOD Inspector General (IG) Report D-2000-088, Feb. 29, 2000; and DOD IG Report D-2006-073, April 17, 2006

SOURCE (Budget Data):
Annual Defense Reports, available at http://www.dod.mil/execsec/adr_intro.html

fact, the standards that the Army uses to bring in an intern today, with a GPA of 3.5, are pretty high," he said.

We are looking for the best and the brightest individuals who are motivated, consider public service to be their higher calling, and understand that the acquisition profession they undertake will afford them opportunities to lead early in their careers. We are looking for people who bring basic skills and knowledge, preferably with the right kinds of degrees and advanced degrees in areas that are acquisition-related. They will be performing jobs such as program analysts, cost analysts,

cost estimators, and contracting officers. Once we get the best talent, we ensure that we train, educate, and develop that talent so our future leadership will continue to instill the high standards of the AL&T Workforce. They will eventually become program managers, engineers on major information and weapon systems programs, and life-cycle logisticians.

If you look at the majority of interns we've hired using Section 852 funding, they've been in the contracting field. Overall, the progress has been dramatic. As of June 1, the Army had hired 1,370 new acquisition professionals, including

809 for the contracting field and 561 in other acquisition career fields (See Figure 2). We haven't just used the growth initiative as a tool to bring on people; we've also created several interesting and targeted pilot programs. We've supported a Science and System Engineer program at the U.S. Army Aviation and Missile Life Cycle Management Command that has proven very successful. Its focus is on bringing the "ilities" skills—reliability, maintainability, and availability—back to that community. The engineers who perform those functions must understand them thoroughly. That was a skill set we had stopped focusing on over time, but

1,370 Acquisition New Hires as of June 1
1,217 interns / 153 journeymen

Figure 2
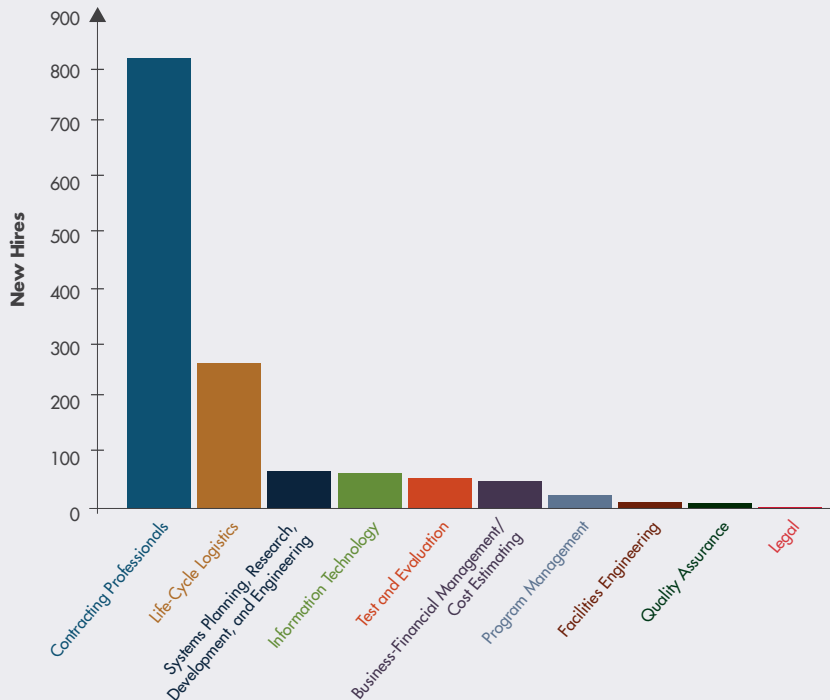
809 Contracting Professionals
732 interns/77 journeymen

268 Life-Cycle Logistics

69 Systems Planning, Research, Development, and Engineering

65 Information Technology

56 Test and Evaluation

55 Business-Financial Management/ Cost Estimating

26 Program Management

11 Facilities Engineering

9 Quality Assurance

2 Legal

SOURCE: USAASC

now recognize that it created a gap in our capabilities. This growth pertains not only to civilians, but to our military counterparts as well.

We have been accessing and growing noncommissioned officers to serve specifically as contracting professionals in the 51C Military Occupational Specialty. These board-selected NCOs receive training at either the U.S. Army Acquisition Center of Excellence at the University of Alabama in Huntsville or the U.S. Air Force Mission Ready Airman Contracting Apprentice Course in San Antonio, TX. After training, the NCOs are assigned to contracting teams where they learn technical skills from experienced contracting civilians. We also have the Functional Area 51 officer program, where we access officers into acquisition and provide them

opportunities to excel in their acquisition skills. We access them only after they've had several years as Soldiers in their respective branches, to look, feel, walk, and talk like other Soldiers, so they will have credibility in that community later in their acquisition careers.

We've been working diligently at growing the AL&T Workforce, but now, the very pendulum that brought acquisition growth is moving in the opposite direction. The Army is now in a time when OCO dollars are coming down, we've withdrawn the majority of our troops from Iraq, our missions in theater are drawing down, and we have financial and manpower reductions across DOD. We're going to be in a very difficult and constrained environment from a resource perspective. History has told

us that resources go up and down, and we are now on the downward side of a resources peak. We are going to have to be prudent and judicious in managing our resources. When DOD has resource challenges, it will look to all its facets, including Army AL&T, to reduce cost and increase efficiencies. We actively support Under Secretary of Defense for Acquisition, Technology, and Logistics Dr. Ashton B. Carter's *Better Buying Power: Mandate for Restoring Affordability and Productivity in Defense Spending.*

That's why the Army Acquisition Workforce Growth Initiative is so critical to getting the right people in the right positions. We can't be more efficient with less-than-stellar performers—we absolutely need the best and the brightest to do more without more.

EDUCATION and TRAINING UPDATE

EXCELLENCE IN GOVERNMENT FELLOWS PROGRAM

Project managers and acquisition professionals can receive hands-on leadership development through Excellence in Government Fellows (EIGF), a leadership program conducted by the Partnership for Public Service in Washington, DC. The nonprofit, nonpartisan organization works to revitalize the federal government by inspiring a new generation to serve and by transforming the way government works. The EIGF program announcement is open through Aug. 25. For more information, visit **http://asc.army.mil/career/programs/eigf/default.cfm**.

ACQUISITION TUITION ASSISTANCE PROGRAM

The Acquisition Tuition Assistance Program (ATAP) offers an opportunity for civilian Acquisition, Logistics, and Technology Workforce members to complete an undergraduate or graduate degree or fulfill the certification of U.S. Army Acquisition Corps membership business-hour requirements. The ATAP announcement is open through Aug. 31. For more information, visit **http://asc.army.mil/career/programs/atap/default.cfm**.

ACQUISITION EDUCATION, TRAINING, AND EXPERIENCE CATALOG

Several educational and leadership opportunities are available in the near term through the U.S. Army Acquisition Support Center. The updated *Acquisition Education, Training, and Experience Catalog* provides in-depth information on all training and developmental opportunities. For information on opportunities available to acquisition civilian and military workforce members, view the catalog at **http://asc.army.mil/career/pubs/aete/default.cfm**. Eligible and interested applicants may apply for programs by using the Army Acquisition Professional Development System tab within the Career Acquisition Management Portal/Career Acquisition Personnel and Position Management Information System at **https://rda.altess.army.mil/camp**.

LTG PILLSBURY RETIRES

LTG James H. Pillsbury, Deputy Commanding General (CG) of U.S. Army Materiel Command (AMC), retired from the Army after 38 years of service and was recognized during a formal ceremony May 6.

Pillsbury previously served as AMC Deputy Chief of Staff (DCS) for Logistics and Operations, leading the reset of millions of pieces of equipment, weapons, and materiel. He had also held the post of CG, U.S. Army Aviation and Missile Command, and DCS, G-4, U.S. Army Europe and Seventh Army.

Pillsbury received many honors during his service, including the Distinguished Service Medal, the Defense Superior Service Medal with Oak Leaf Cluster, and the Legion of Merit with two Oak Leaf Clusters.

NEW DASA(P) APPOINTED

Kim Denver officially assumed the role of Deputy Assistant Secretary of the Army for Procurement (DASA(P)) on June 19. Previously the Director of Contracting, U.S. Army Corps of Engineers National Contracting Organization, Denver has more than 20 years of contracting experience.

Denver holds Level III certifications in contracting and acquisition and in project management, and is a member of the U.S. Army Acquisition Corps. In 2008, he received the Commander's Award for Civil Service. Denver holds a B.S. in business administration from the University of Texas at San Antonio and an M.B.A. from the University of Central Florida.

PEO CHANGES OF CHARTER

BG Camille M. Nichols assumed the charter of Program Executive Office (PEO) Soldier on April 29. She has more than 20 years of defense acquisition experience, most recently serving as CG, Joint Contracting Command, U.S Forces-Iraq, and previously holding the same post at U.S. Army Expeditionary Contracting Command.

Nichols is a recipient of the Defense Superior Service Medal with two Oak Leaf Clusters and the Legion of Merit, among other decorations and badges. She replaces **MG Peter N. Fuller**, who is now Deputy Commander for Programs, Combined Security Transition Command-Afghanistan.

***

The PEO Intelligence, Electronic Warfare, and Sensors (IEW&S) Charter was transferred from **Douglas Wiltsie**, who was acting in that position, to **BG Harold J. Greene** on May 26. Wiltsie returned to the position of Deputy PEO.

Greene previously served as Deputy CG, U.S. Army Research, Development, and Engineering Command, and Senior Commander of Natick Soldier Systems Center.

His decorations include the Legion of Merit with Oak Leaf Cluster, and the Meritorious Service Medal with five Oak Leaf Clusters.

Mindful of the changes DOD is undergoing, during the May 26 ceremony Greene highlighted numerous challenges for the PEO, including completing the Base Realignment and Closure move to Aberdeen Proving Ground, MD; operating with decreased resources; adjusting to new leadership at the highest levels of the Army and DOD; and preparing for the drawdown from Afghanistan.

ARMY NAMES PROJECT MANAGERS AND HEADS OF CONTRACTING ACTIVITIES

Numerous Soldiers were recently selected as project managers, product managers, or heads of contracting activities. These selections recognize each individual's service, performance, and ability to lead within the Army Acquisition, Logistics, and Technology community.

For the full lists of O-5 and O-6 selectees, visit **http://asc.army.mil/docs/announcement/LtcAcqCmdSel12.pdf** and **http://asc.army.mil/docs/announcement/ColAcqCmdSel12.pdf**.

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Is there a challenge or a solution in AL&T that you'd like to bring to our attention?
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Articles should be kept to 1,600 words and will be edited for style and space. Please include your name, title, organization, and daytime contact information so that we can verify your article. Writers guidelines are at http://asc.army.mil/docs/pubs/alt/ASC_0211_WriterGuidelinesv5_2-17-11.pdf.

Send queries or articles by postal mail or email to:

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CONGRESSIONAL UPDATE

RECENT ACTION

U.S. House of Representatives

On May 9, the House Armed Services Committee approved the *National Defense Authorization Act* (*NDAA*) *for Fiscal Year 2012*, H.R. 1540. The bill provides budget authority for DOD and the national security programs of the U.S. Department of Energy. On May 26, the full House passed the *NDAA* by a 322-96 vote.

According to the Congressional Budget Office (CBO), the House version of the NDAA totals $690 billion in spending for FY12. The bill also contains provisions altering obligations for discretionary defense programs in 2013 and future years. Those implicit authorizations would affect force structure, DOD compensation and benefits, DOD's use of multiyear procurement authority, and other programs and activities.

CBO's full summary of the bill can be found at **http://www.cbo.gov/ftpdocs/122xx/doc12202/hr1540.pdf**.

The House passed the *Defense Appropriations Act for Fiscal Year 2012*, H.R. 2219, on July 8. The bill can be viewed at **http://www.gpo.gov/fdsys/pkg/BILLS-112hr2219eh/pdf/BILLS-112hr2219eh.pdf**.

U.S. Senate

The Senate Armed Services Committee (SASC) unanimously passed its version of the *NDAA* on June 17. Sen. Carl Levin (D-MI), Committee Chairman, released a statement highlighting provisions in the bill, including several related to acquisition, logistics, and technology, at

MAJOR ACTIONS

The House passed the FY12 *Defense Appropriations Act*. It also passed the FY12 *National Defense Authorization Act*. Both bills are now being considered in the Senate. (Photo courtesy of Architect of the Capitol.)

http://armed-services.senate.gov/press/NDAA%20FY12%20Markup%20Press%20Release.pdf.

FUTURE ACTION

The SASC version of the *NDAA* is expected to go to the full Senate for consideration as soon as July. Once the bill passes the Senate, a conference committee will reconcile the differences between the House and Senate versions of the *NDAA*.

HEARINGS

On April 5, the SASC received testimony from Frank Kendall, Principal Deputy Under Secretary of Defense for Acquisition, Technology, and Logistics, at a committee hearing on the health and status of the defense industrial base and its

science and technology-related elements. His prepared statement and a webcast of his testimony are at **http://armed-services.senate.gov/e_witnesslist.cfm?id=5163**.

Also on April 5, members of the SASC Subcommittee on Airland received testimony on Army modernization from GEN Peter W. Chiarelli, Vice Chief of Staff of the Army; LTG Robert P. Lennox, Deputy Chief of Staff of the Army, G-8; and LTG William N. Phillips, Principal Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, and Director, Acquisition Career Management. A webcast of their testimony is at **http://armed-services.senate.gov/e_witnesslist.cfm?id=5077**.

HEARING SCHEDULES

House Appropriations Committee: **http://appropriations.house.gov**

House Armed Services Committee: **http://armedservices.house.gov/index.cfm/hearings**

House Oversight and Government Reform Committee: **http://oversight.house.gov**

Senate Appropriations Committee: **http://appropriations.senate.gov**

Senate Armed Services Committee: **http://armed-services.senate.gov/hearings.cfm**

Senate Homeland Security and Government Affairs Committee: **http://hsgac.senate.gov/public/index.cfm?FuseAction=Hearings.ListAll**

OFF THE SHELF

RECOMMENDED READING LIST

Numerous Army leaders over the years, officers and enlisted alike, have commended the practice of reading to their Soldiers. Even—especially—in this age of information overload, the pursuit of knowledge through books is essential to gain a fuller understanding of acquisition, logistics, and technology. In the words of GEN Gordon R. Sullivan (USA, Ret.), 32nd Chief of Staff of the Army, "At no time in history has the volume of information available to the human race been as accessible as it is today, nor as essential. ... Reading teaches conceptual analysis, offers insights to ponder, and expands both the imagination and the potential of the mind." With this issue, *Army AL&T* Magazine is introducing Off the Shelf as a regular feature to bring you recommendations for reading from Army AL&T professionals.

Is there a book you'd like to recommend for this column? Send us an email at USAASCWEB-AR@conus.army.mil. Please include your name and daytime contact information.

MONEYBALL: THE ART OF WINNING AN UNFAIR GAME
by Michael Lewis
(New York, NY: W.W. Norton & Co., 2004, 320 pages)

Who says you have to spend megabucks to win? *Moneyball* comes recommended by LTG Robert P. Lennox, Deputy Chief of Staff, G-8, and LTG William N. Phillips, Principal Military Deputy to the ASAALT and Director, Acquisition Career Management. LTG Lennox describes it as a book that "shows that analysis of the facts can have dramatically good results." This best-seller by former Salomon Brothers investment adviser-turned-financial journalist Michael Lewis, illustrates, in play-by-play detail, how Oakland Athletics General Manager Billy Beane built a winning team with a smaller budget than that of nearly every other Major League Baseball team. Players with certain carefully selected stats held more value, he believed, than big-name, highly paid young superstars. Putting that principle into practice was another story. But defying conventional wisdom paid off: Beane and his staff won affordably, with an astonishing record in 2002.

THINK TWICE: HARNESSING THE POWER OF COUNTERINTUITION
by Michael J. Mauboussin
(Boston, MA: Harvard Business Press, 2009, 204 pages)

Michael J. Mauboussin, Chief Investment Strategist at Legg Mason Capital Management, uses his business expertise to explore why leaders mismanage decision making. With examples from the business world and beyond, he outlines eight common decision-making mistakes and offers advice on how to "think twice" and recognize these cognitive errors, then to adopt more effective strategies. Recommended by LTG Lennox, *Think Twice* aims to equip leaders with the tools to make sounder decisions that will improve, instead of hinder, their organizations. The book is a relatively short read, making it an excellent resource for busy professionals.

LEADING CHANGE
by John P. Kotter
(Boston, MA: Harvard Business Press, 1996, 208 pages)

John P. Kotter's eight-step framework for executing change is a road map that any person in business or government—whether working at an executive level or as a first-year student—should know and implement. Recommended by LTG Phillips, Kotter's book explains the intangibles of the ever-evolving 21st-century business environment.

The Konosuke Matsushita Professor of Leadership, Emeritus, at the Harvard Business School, Kotter is an international expert on leadership and change. *Leading Change* examines the characteristics of true leadership and stresses that effective business professionals don't react to change for the sake of trying to manage it, but instead stay ahead of change and usher it in. It's a distinction that not only saves valuable time and resources, but also improves the likelihood of success.

RECOMMENDED READING LIST

THE LEMON TREE: AN ARAB, A JEW, AND THE HEART OF THE MIDDLE EAST
by Sandy Tolan
(New York, NY: Bloomsbury USA, 2006, 384 pages)

The Lemon Tree explores the conflict between Israel and Palestine through the lives of a Jewish settler and a Palestinian refugee, and the house and lemon tree that hold the past, present, and future of both their families. The account grew out of Tolan's work on a National Public Radio documentary in 1998 and comes recommended by Keith B. Webster, Deputy Assistant Secretary of the Army for Defense Exports and Cooperation. Tolan, co-founder of Homeland Productions, has produced hundreds of documentaries and features and has won more than 25 national and international journalism awards. His book is an excellent source for those looking to further understand the Israeli-Palestinian conflict without the dry, strictly factual inclination of many history books.
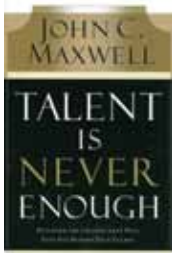
TALENT IS NEVER ENOUGH: DISCOVER THE CHOICES THAT WILL TAKE YOU BEYOND YOUR TALENTS
by John C. Maxwell
(Nashville, TN: Thomas Nelson Inc., 2007, 304 pages)

Dr. John C. Maxwell, an internationally known leadership expert and best-selling author, begins his book with this premise: Talent is often overrated and frequently misunderstood. In fact, he maintains that greatness is as much about making the right choices as it is about having the right talents. Maxwell's book, recommended by Craig A. Spisak, Director of the U.S. Army Acquisition Support Center and Deputy Director, Acquisition Career Management, lays out 13 principles for maximizing talent, from "Belief lifts your talent" to "Teamwork multiplies your talent," showing how each principle has worked in the lives of well-known figures past and present.

CRUCIAL CONVERSATIONS: TOOLS FOR TALKING WHEN STAKES ARE HIGH
by Kerry Patterson, Joseph Grenny, Ron McMillan, and Al Switzler
(New York, NY: McGraw-Hill, 2002, 256 pages)

Few books offer strategies that significantly enhance almost every connection in your life, but this one does. From your career to your relationships with family and friends, *Crucial Conversations* is a best-seller providing tips to greatly enhance the one thing you do with almost every person you come in contact with: communicate. The authors are top international corporate consultants and co-founders of Vitality Alliance Inc. and VitalSmarts. Recommended by Kevin Zurmuehlen, Deputy Director, U.S. Army Acquisition Center of Excellence, *Crucial Conversations* teaches the skills that will help resolve conflict, express your opinions without being abrasive, and articulate a message clearly and effectively, increasing the chances of success.

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"Right now any technical integration
issue in theater must be fixed in theater.
We owe it to our Soldiers to do better.
And with the establishment of the Network
Integration Center, we will bear that integration
burden, not our Soldiers and commanders
downrange. That's the right answer."

GEN Peter W. Chiarelli
Vice Chief of Staff of the Army

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