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# ARMY AL&T

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JANUARY-MARCH 2014

## Army Industrial Base

### NETWORK AFTER NEXT

Consistency, competition  
drive Army's strategy

### STEM STRATEGY

USACE takes  
multiple approaches  
to build workforce

### MAKE OR BUY

Innovative tool  
weighs commercial,  
organic factors



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### CORRECTION

An article in the October-December 2013 issue of Army AL&T ("Homing in on Savings," Page 20) incorrectly described the systems involved in Product Manager (PdM) Radars' conversion of a quick reaction capability (QRC) to a program of record (POR). PdM Radars, assigned to Project Manager Cruise Missile Defense Systems in Program Executive Office Missiles and Space, is producing the next-generation counter-fire target acquisition radar, the AN/TPQ-53, which will replace the legacy AN/TPQ-36 and AN/TPQ-37 "Firefinder" radar systems by the end of 2019. A branch of the AN/TPQ-53 POR, the Enhanced AN/TPQ-36 (EQ-36) QRC, was initially fielded in 2010 and has been saving lives in Iraq and Afghanistan ever since. PdM Radars now stands poised to retrofit the QRC systems fully into the POR configuration.

# From the Editor-in-Chief

In 2008, I was the director of communications for BAE Systems' Mobility and Protection Systems line of business. Our business made everything from helmets to vehicle armor and, most importantly, the Family of Medium Tactical Vehicles (FMTV).

Like many defense contractors, we had an extensive line of products with world-class capabilities, an expert workforce and cutting-edge technology. Fast forward five years and, in the case of vehicle production, the almost 1 million-square-foot FMTV manufacturing plant in Sealy, TX, is being shuttered. What will happen to the special vehicle rustproofing techniques developed there, the assembly line know-how of the workforce and the engineering expertise?

Gone. In fact, many essential capabilities and workforce skills that are crucial to our Soldiers' decisive edge over our enemies could disappear unless we do something to protect them. And that, in a nutshell, is the focus of this issue: preserving the most essential of the often highly specialized capabilities that the Army's industrial base provides, but in an austere budget environment.

Unlike in the simpler era before World War II when there was no permanent defense industry and we could switch from making plowshares to swords as the need arose, today "we can no longer risk emergency improvisation of national defense; we have been compelled to create a permanent armaments industry of vast proportions," just as President Dwight D. Eisenhower said in his 1961 farewell address.

However, there are limits to budgets, and the Army soon will find itself at relative peace for the first time in more than a decade with no impending wars, and limited need for many of the weapons and capabilities that make our warfighters dominant on the battlefield. Without the massive infusion of defense dollars that we've seen over the past 12 years, some niche companies, small

businesses and even giant original equipment manufacturers may be at risk of going out of business, or losing so much money that it's not worth focusing on military requirements anymore. Thus we risk losing needed military expertise.

However, not everything can be saved in this fiscally constrained environment, nor does everything need to be saved. The question is, can we preserve those parts of the industrial base that we need to keep our edge—and, if so, what and how much? Are there alternatives to Army funding to support programs? Finally, can new procurement strategies, such as small business set-asides and multiyear procurements, stretch our defense purchasing power while ensuring financial stability for the defense industry? The short answer to all of the above is an emphatic "Yes."

The Army is constantly evaluating how to preserve needed capabilities in its commercial and organic industrial base by modernizing facilities with new technology, training and plant equipment. We continue to work with the Office of the Secretary of Defense on the Sector-by-Sector, Tier-by-Tier Assessment to evaluate impacts on all defense industrial base sectors. Critical impacts within our equipment portfolios are addressed through ongoing and future modernization planning. The Army is also conducting a comprehensive Combat Vehicle Portfolio Industrial Base Study to assess the commercial and organic combat vehicle industrial base, viable strategic alternatives and sustainment of the base in a constrained fiscal environment.

But preservation of the industrial base means more than ensuring that those businesses from which the Army buys equipment don't have to close their doors because of a lack of sales to one of their biggest customers. It means retaining our ability to fight, and win, our nation's wars.

As always, if you have ideas, comments or critiques to help make the magazine better, please contact me at [armyalt@gmail.com](mailto:armyalt@gmail.com).

**Nelson McCouch III**  
*Editor-in-Chief*



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JANUARY-MARCH 2014

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The health of the Army's industrial base is critical to the Army and the nation. At the heart of that base are the people with the knowledge, skills and abilities that keep the Army one step ahead. This image, from Westinghouse in 1942, captures the can-do spirit of those people.

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# INDUSTRIAL BASE







FROM THE AAE

FROM THE ARMY ACQUISITION EXECUTIVE  
THE HONORABLE HEIDI SHYU



FROM THE AAE

# In Hard TRUTH, NEW OPPORTUNITY

Changing times call for Army and industrial base to collaborate on solutions

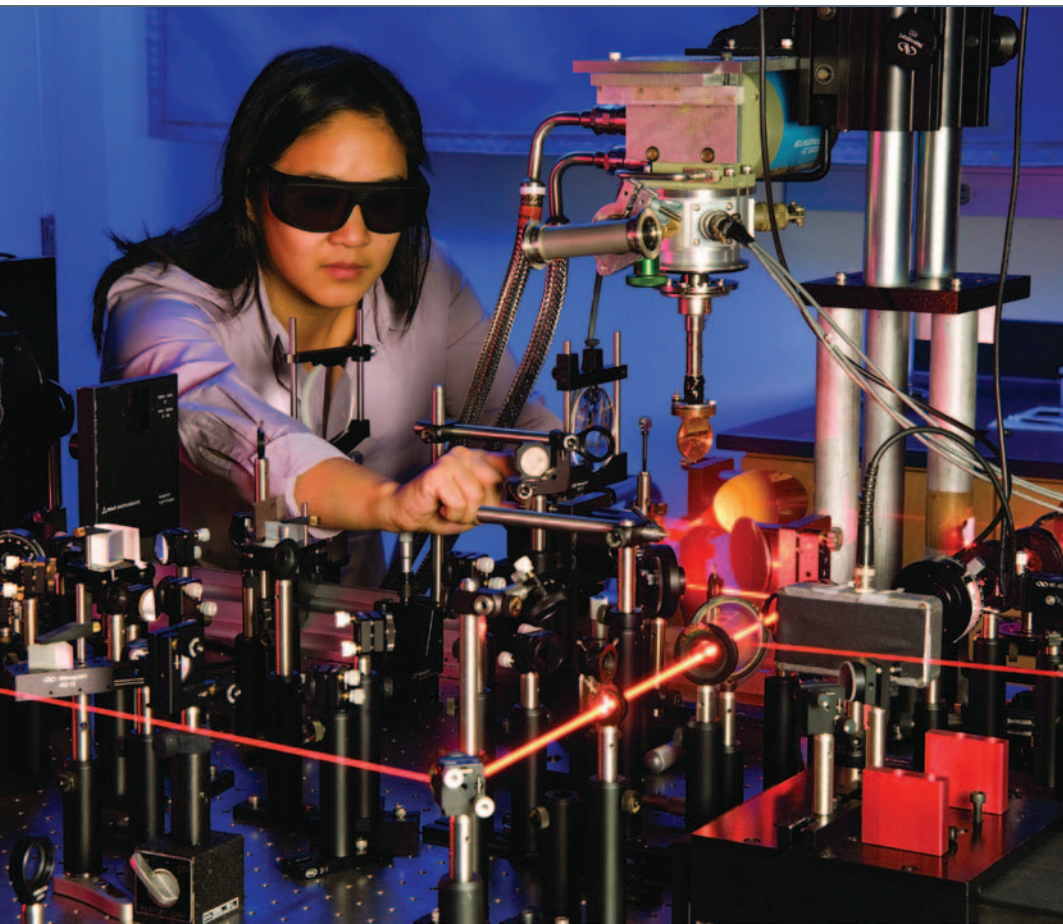
## MISSION FOCUS

Soldiers assigned to 6th Squadron, 4th Cavalry Regiment (6-4 CAV), 3rd Brigade Combat Team, 1st Infantry Division launch a mortar Nov. 10, 2013, in Baghlan province, Afghanistan, during a training exercise. Even as fiscal and economic conditions change, the Army remains committed to providing the best equipment to the warfighter at the best value for the taxpayer. (Photo by 1LT Cory Titus, 6-4 CAV)

As we enter a new calendar year, the Army faces challenges of an evolving fiscal reality and the transition from wartime production to peacetime requirements. The Army and its industrial base must work together to address these issues head-on. The hard truth—sustaining readiness in this fiscally constrained environment—necessarily means fewer investments in the future. Budget uncertainty complicates the procurement landscape, but communication and cooperation will allow the Army and industrial base to meet our respective goals.

Defense spending is projected to make up only 12 percent of the federal budget in FY17, down from 17 percent in FY13. Those numbers are a world away from the 49 percent of the federal budget consumed by defense during the 1960s. At the same time, the budget for research, development and acquisition (RDA) is declining faster than the overall defense budget.

Nothing highlights this more concretely than the Army's total obligation authority (TOA) for FY14, which, at \$129.7 billion, is 15 percent lower than the FY12 Army TOA of \$152.6 billion. Compare this to the FY14 Army RDA budget of \$23.95



#### PUTTING THE R IN RDA

Dr. Grace Metcalfe, a researcher at the Adelphi Laboratory Center of the U.S. Army Research Laboratory (ARL), is part of the Sensors and Electron Devices Directorate team that developed and successfully tested new ways of generating terahertz emissions, work that has potential biomedical and security applications. The RDA budget is declining faster than the overall defense budget, with implications for the Army's investments in emerging technologies to develop next-generation capabilities. (Photo by Doug LaFon, ARL)

billion, which is down an amazing 28 percent from the FY12 RDA budget of \$33.2 billion. A Nov 28, 2013, article in *The Washington Post* profiled members of the West Point Class of 2014 and gave a compelling description of the challenge. A 22-year-old cadet wisely noted that the key question is not how to do more with less, but how to determine “what we’re going to do and what we’re going to do well.” In other words: What’s going to be good enough?

Procurement budgets naturally contract after a war. The end of the Cold War saw a wave of consolidation, mergers and acquisitions in the commercial base. Although industry consolidation reduced duplication and redundancy, it also resulted in many of today’s critical defense assets being manufactured by only a limited number of firms. As the U.S. manufacturing sector has decreased overall, defense manufacturing has taken on a greater significance for remaining

firms. But while there are fewer large players than in previous drawdowns, there has been a proliferation of small businesses working as subcontractors—providing engineering services, doing research and development, and manufacturing specialized components.

Today’s industrial base includes a large population of highly skilled technical and knowledge workers, many of them employed by specialized third- and fourth-tier subcontractors. Keeping these skilled employees within the industrial base has the added benefit of enhancing support for the Army’s small business partners. The rapid decline in our RDA budget creates significant challenges for small companies that must diversify quickly, but the Army has met its 25 percent small business goal for the past three years. This helps small businesses continue to innovate and deliver products and services to our warfighters.

It is just as important to note the opportunities created by the coming drawdown. The Army and industry can begin a new level of dialogue around modernization, which technologies best meet national security needs and how to integrate new technologies into existing infrastructure. Although the organic and commercial industrial base sectors are often discussed as distinct communities, public-private partnership at Army depots and essential facilities is a potential core strategy to ensure that parts and materials are available to sustain platforms and equipment at appropriate readiness levels.

As the Army assesses and identifies capabilities and competencies at its depots and arsenals, the commercial base is a vital stakeholder. The commercial base, in particular, is well-positioned to





help the Army better use commercial off-the-shelf products and production techniques that can yield new efficiencies and increase the buying power of the defense dollar.

Consider an example from Program Executive Office Ammunition: Staff implemented a long-term strategy for recurring procurement of artillery and mortar components. A \$2.7 billion small business set-aside strategy eliminated the need for more than 100 separate market surveys, synopses and requests for proposals, and reduced average delivery time from 18-24 months to 45-60 days. This efficient new procurement strategy will help the Army avoid \$60 million in costs while supporting small business.

Multiyear procurement (MYP) is another proven strategy for lowering cost to the taxpayer while reducing financial uncertainty for industry. The CH-47 Chinook MYP has saved taxpayers nearly \$500 million to date while enhancing the environment for sharing lessons learned between the Army and industry, and incentivizing quality assurance.

As President Ronald Reagan observed, “no weapon in the arsenals of the world is so formidable as the will and moral courage of free men and women.” We remain committed to providing the best equipment to the warfighter at the best value for the taxpayer. Painful choices will have to be made on force structure, readiness and modernization. The Army’s desired end goal is to meet the nation’s and world’s security needs while we invest in emerging technologies to develop the next generation of capabilities.



#### ROBOTIC CAPABILITY

Undersecretary of the Army Joseph W. Westphal, left, talks with retired LTC David Viens of iRobot Corp. Oct. 22, 2013, at the Association of the United States Army Annual Meeting and Exposition in Washington, DC. As the Army assesses and identifies capabilities and competencies, the commercial industrial base is a vital stakeholder. (U.S. Army photo by SSG Bernardo Fuller)



#### SAVINGS + SUSTAINMENT

CH-47 Chinook helicopters of the 10th Combat Aviation Brigade (CAB) await their next mission at Bagram Airfield, Afghanistan, Nov. 11, 2013. The CH-47 Chinook MYP has saved taxpayers nearly \$500 million while reducing financial uncertainty for industry. (U.S. Army photo illustration by SSG Todd Pouliot, 10th CAB)



## ACQUISITION

# Layers of Concern

Assessing the health of the Army's industrial base is a complex task

*by Mr. Juan L. Millan*

**T**he Army industrial base of today is more global, commercial and financially complex than that of 10 or 15 years ago. Prime suppliers have increased their role as integrators and delegated key innovation and development roles to a vast and complex network of sub-tier suppliers. Sub-tier suppliers have responded with their own complex network of suppliers, some of which are small, highly skilled and defense-dependent firms. These small, specialized firms serve as the warning indicator for the health of the overall industrial base.

The Army understands that the industry supporting defense is reshaping itself to respond to significant changes in military missions that translate to a sizable reduction in the demand for supplies and equipment. Major defense firms are responding by reducing excess capacity, streamlining processes and revamping supplier relationships. In addition, the financial uncertainty of sequestration will affect the future demand for new systems.

All of these factors create a high-risk environment for manufacturers and suppliers. The key question is: "How is the Army addressing the challenges to maintain the industrial base that supports the warfighter?"

First, the Army must determine which industrial capabilities are unique and vital to our national defense, and whether the

military and its capabilities will be in jeopardy when a company decides to terminate a vital activity or move production offshore. Second, the Army must determine how major players can support the smaller force so that it remains credible and capable. Doing this requires involvement from multiple organizations at the strategic, tactical and operational levels, developing strong, ongoing and mutually beneficial joint relationships with their counterparts in the private sector to help minimize the impact of a potential loss in capabilities.

The Army is taking a proactive approach to ensure the preservation of those critical and essential capabilities needed for future short- and long-term operations. In order to identify the risks and issues impacting the industrial base, the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology (OASA(ALT)) has established collaborative efforts with major players such as the Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy, the U.S. Army Materiel Command, the Defense Logistics Agency, the U.S. Department of Commerce and the Defense Contract Management Agency.

### ASSESSING THE RISKS

As the Army draws down from contingency operations, some of the industrial base issues being addressed include excess capacity, limited incentives for private investment, commercial





### CRITICAL ANALYSIS

A Soldier checks a WINT Increment 2 Point of Presence-equipped vehicle at Forward Operating Base Gamberi, Afghanistan, in September 2013. WIN-T is one of the Army systems to have undergone a FaC analysis. (U.S. Army photo by SPC Edward Bates, 4th Brigade Combat Team, 10th Mountain Division Public Affairs)

sources exiting the defense business, a growing dependence on foreign suppliers, shrinking and aging stockpiles, and declining commercial research and development capabilities.

For assessment purposes, the Army has organized its industrial base into five sectors, following the way program executive offices (PEOs), life cycle management commands (LCMCs), and research, development and engineering centers (RDECs) are structured by commodity. (See Figure 1 on Page 10.)

The Army is also fully engaged in joint assessment efforts focused on

the identification of risks and issues impacting the industrial base's ability to sustain readiness. They are:

**1. The Sector-by-Sector, Tier-by-Tier (S2T2) Assessment**—S2T2 seeks to establish early-warning indicators of risk, particularly at lower tiers, to promote policies to mitigate potential points of failure, reduce overreliance on foreign sourcing and identify areas of limited competition. The S2T2 assessment, which started in 2011, entails surveying, collecting and analyzing data from the commercial sector, reviewing outside expert reports and assessing challenges to the manufacturing community. A

critical part of the S2T2 effort is the series of fragility and criticality (FaC) assessments. The FaC assessments map fragile and critical niches in the defense industrial base, to facilitate risk-mitigation investment decisions. The information generated will allow program offices to accurately gauge how potential reductions in funding could affect suppliers who provide the capabilities, products, skills and services needed to support requirements. Below are some recent products of the S2T2 FaC process:

- The M1 Abrams tank assessment enabled the team to narrow down a list of thousands of suppliers to a manageable

FIGURE 1



## FIVE SECTORS

The Army has divided the industrial base into five sectors that align with the efforts of PEOs, LCMCs and other major players. (SOURCE: Juan L. Millan)

number. As a result, a supplier of critical components (tank periscopes) was identified and a project funded to keep this fragile capability available for future ground vehicle programs.

- The Warfighter Information Network – Tactical (WIN-T) assessment revealed specialized skill sets and a critical supplier at high risk of being lost due to decreased funding. (See related article on Page 42.)

- The rotary-wing and missile sector's Gray Eagle Unmanned Aircraft System (UAS) assessment provided a list of critical skills or production capabilities at high risk of being lost due to decreased funding. The assessment will facilitate the development of strategies to mitigate these risks.

## 2. The Industrial Base Baseline Assessment (IBBA)—The IBBA is another

effort to evaluate the ability of the Army's production base to sustain acquisition and readiness, and to provide recommendations for risk mitigation.

Through the integration of program inputs from each LCMC, RDEC, PEO and senior Army leadership, the IBBA focuses each organization's assessment on critical industrial base capabilities, technologies and capacities.

## CONCLUSION

It takes a joint approach by major players to assess the many challenges faced by the defense industrial base and find solutions that will preserve its health, integrity and technical superiority in support of the warfighter.

There is no doubt that the current wave of defense cuts, combining predictable effects of the drawdowns from Iraq and Afghanistan with the unpredictable consequences of sequestration, is very different from past defense budget reductions, and its impact on the industrial base is going to be significant. This impact calls on the Army to balance cuts across all parts of acquisition and force structure and to limit million-dollar problems to million-dollar solutions.

The challenges are forcing the Army to take a deep, hard look at the firms that supply the technologies our armed forces use, as they are important to national security.

Qualitative superiority in weaponry and other key military technology has become an essential element of American military power in the modern era, not only for winning wars but also for deterring them.

To be successful, the future industrial base must be capability- and capacity-based, using innovative practices to achieve integrated capabilities that are both flexible and responsive.





**QUALITATIVE SUPERIORITY  
IN WEAPONRY AND  
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ERA, NOT ONLY FOR  
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#### A QUESTION OF FRAGILITY

The crew of an M1A2 Abrams Tank from 3rd Battalion, 8th Cavalry Regiment, 3rd Brigade Combat Team, 1st Cavalry Division (3-1 CAV) fires during the battalion's Table VI live-fire gunnery Sept. 24, 2013, at Fort Hood, TX. Assessing the Abrams tank's industrial base enabled the Army to identify fragile capabilities. (U.S. Army photo by SGT Kim Browne, 3-1 CAV Public Affairs)

In the short term, the Army should focus on identifying only those truly critical and essential capabilities that it will need to preserve for regeneration purposes. In the long term, the Army should focus on identifying potential capability gaps and target its investments based on key fragile industrial capabilities needed now and in the future.

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*MR. JUAN L. MILLAN serves as a senior industrial base policy specialist in the Acquisition and Industrial Base Policy Directorate of OASA(ALT). He holds a B.S. in industrial engineering from the Polytechnic University of Puerto Rico, a B.B.A. from Puerto Rico's State University and an M.S. in management from the Florida Institute of Technology. Millan is Level III certified in program management and in production, quality and manufacturing. He also holds a Lean Six Sigma Yellow Belt, and is a member of the U.S. Army Acquisition Corps.*



#### COMPLEX RELATIONSHIPS

The Gray Eagle UAS incorporates elements of WIN-T Increment 3, such as a Highband Radio Frequency Unit - Extended Range Multi-Purpose Ku-band line-of-sight transmission system, shown here during testing in late 2012. FaC assessments have shown how an industrial base issue with one key capability can affect another. (U.S. Army photo)

# Ground Truth: Lessons Learned on Working Effectively with Industry

*In addition to thorough top-down, big-picture assessments of the industrial base, there is much to be learned at the program level that will support the health of industry and its continued ability to provide critical materiel. The Army's Acquisition Lessons Learned Portal (ALLP) offers a wealth of valuable lessons that relate directly to preserving the industrial base on a day-to-day basis. Following is a sample of these lessons, with the corresponding reference numbers.*

**Communication**—Be more engaged than ever with potential suppliers early, and use them to identify future capability needs, assess future technological endeavors and provide feedback at all stages. Communication between DOD and industry will be increasingly important to achieve these goals.

One Army program reported that early communication with industry is imperative to improve responses and competition during contract source selection. This program's leadership began discussions 24 months ahead of the anticipated contract award date. By starting early, they were able to engage industry on requirements and gather information about best practices, optimal contract vehicles, labor rates and the context of the performance work statement (PWS), as well as

development and deployment methodologies. Through continued dialogue, they were able to gather information that was instrumental in building a comprehensive PWS with sufficient details to ensure that all requirements were addressed. In addition, they generated interest from a wide range of industry partners. During their due diligence sessions, a total of 19 companies came to discuss the draft request for proposal, where historically they had only had two. (ALLP LL #49)

Another program reported improving communication by proactively providing avenues for industry to critique the requirements, schedule, funding profile and procurement package for engineering and manufacturing development (EMD) prototypes. This allowed industry to provide comprehensive feedback on draft EMD requirements. Other opportunities included industry days, inviting industry to comment on various topics through the program's website, and asking industry to participate in one-on-one meetings with the government to ask questions and provide feedback. This collaborative effort would benefit other programs about to embark upon a competitive phase. (ALLP LL #51)

Yet another program stressed the importance of free and open communication

between the government and the contractor, specifically that the government make all documents available to the contractor that law or regulation allows to be shared; that all assumptions be communicated to the contractor; and that biweekly meetings be held between the government and the contractor to ensure that everyone has the same understanding of the issues. (ALLP LL #93)

**Contracting**—Balance cost, schedule and performance along with the need for a capability when negotiating contracts with industry. Attention to contract details can result in superior program support by contractors, along with program cost and schedule savings, by eliminating ambiguities that lead to program delays and cost overruns.

Lessons shared from a recently canceled program reported that selection of contract type, content and management are some of the key elements of a successful program. This ALLP submission advised that cost contracts have the potential to be mishandled, and recommended rewarding contractors for making progress, not for spending money. In addition, program officials recommended reviewing the contract structure to extend assessment of the risks beyond the prime contractor to the subcontractors, to





### FRONT LINES OF INDUSTRY

Undersecretary of the Army Joseph W. Westphal, center right, and LTG William N. Phillips, principal military deputy to the assistant secretary of the Army for acquisition, logistics and technology, conduct industry visits in Pennsylvania and Arizona from Aug. 14 to 30, 2013. Close communication with industry has been shown to pay off in identifying future capability needs and industrial base risks. (Photo by SSG Bernardo Fuller)



### DAY FOR NIGHT

2LT Ethan Fry checks out a clip-on night vision device at L3 Warrior Systems' booth during a Military Police Regimental Association trade exhibition Aug. 27, 2013, at Fort Leonard Wood, MO. Trade shows and industry days can help acquisition professionals build productive relationships with industry. (Photo by Melissa K. Buckley, Fort Leonard Wood)

identify whether they possess the appropriate skill sets and technology to support the program. (ALLP LL #346)

Another program recommended that as development moves from Milestone B to Milestone C, evaluation criteria should become increasingly specific, objective and quantified, focusing on critical events and deliverables. Program officials suggested incorporating language in the contract stating the expected value that would result in a 100 percent award fee, as well as less acceptable values for lower amounts of award fee, to incentivize and reward contractors for good performance. (ALLP LL #212)

One lesson learned stated that well-developed, precise contract language will ensure that the contractor and the government are in clear agreement on all aspects of the program, which will result in cost savings. This submission recommended including language developed by the Army Center for Reliability Growth (<http://web.amsaa.army.mil/CRG.html>), whose mission is to help the government and industry integrate key reliability activities into the design and systems engineering process. (ALLP LL #332)

Another program recommended including contract language that incentivizes cooperation between contractors with interdependent products. This lesson stressed that crafting appropriate contract language will require coordination between program offices, because the contractors are likely to work under different contracts. (ALLP #219)

*For more information and acquisition lessons learned, go to <https://allp.amsaa.army.mil> to request an account.*

—MS. GAIL CAYCE-ADAMS, AMSAA

# Securing *the* Base

DOD policymakers have complex array of tools to help protect industrial capabilities

*by Mr. Kris Osborn*

**A**s DOD grapples with multiple fiscal challenges, the Army and the Pentagon are stepping up efforts to sustain and preserve the health of the U.S. defense industrial base (IB) by assessing vendor capabilities, watching for mergers and acquisitions, and analyzing the supply chain for critical capabilities.

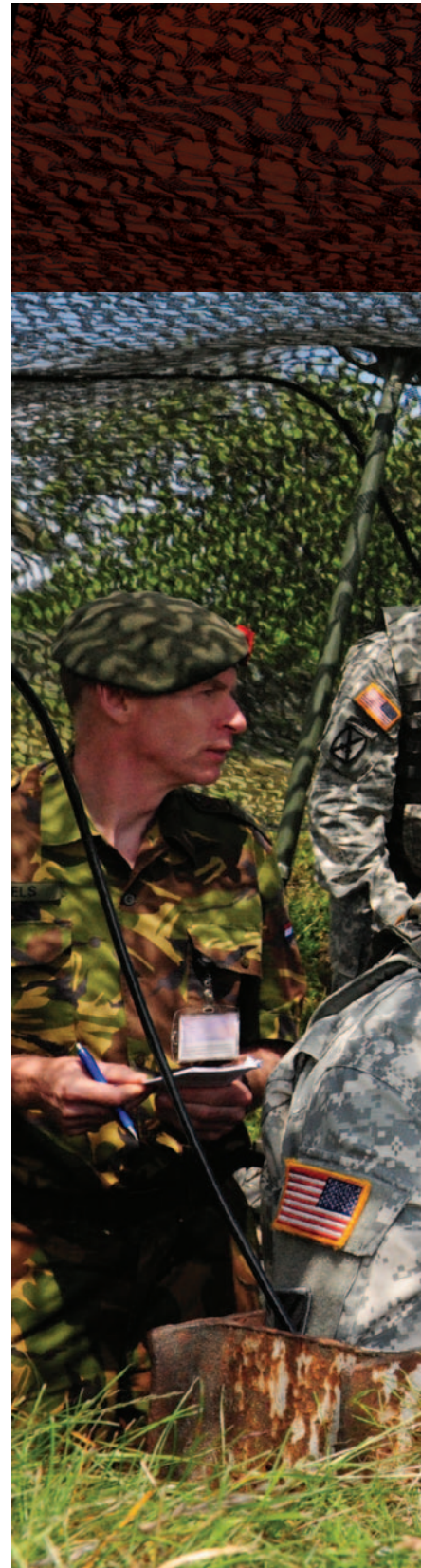
In its 2013 report to Congress on the health of the defense IB, the Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy (MIBP) notes DOD's tightening fiscal constraints and widespread concern about their effects on the IB, but says only a small portion of the IB is truly at risk. "DOD recognizes [that] only a small fraction of our enormous industrial base capabilities are truly at risk (fragile) and, therefore, in danger of disappearing without dedicated efforts to sustain

them," states the October 2013 report from MIBP, in the Office of the Undersecretary of Defense for Acquisition, Technology and Logistics (USD(ATL)).

That does not mean, however, that the risk is insignificant, the report states.

"The United States is in danger of losing some key industrial capabilities that will be vital for our future national security. Insufficient near-term demand for certain products will keep some companies below their minimum economic sustaining rates, making it financially challenging to keep workers with unique, technical expertise active enough to maintain their proficiency in these advanced skills," the report states.

The fiscal pressures on the U.S. military in the coming months and years include a shrinking defense budget, the lingering







### STRATEGIC INVESTMENT

SFC Antonio Arellano, center, and SFC David Stegman of U.S. Army Europe's 19th Battlefield Coordination Detachment review targeting information using a Defense Advanced GPS Receiver during a multinational artillery live-fire exercise in Baumholder, Germany, June 20, 2013. DOD has invested in a number of areas to preserve critical capabilities, including GPS-related technologies. (Photo by SGT Daniel Cole, U.S. Army Europe Public Affairs)





effects of deep sequestration cuts last year, and the prospect of further sequestration cuts in 2014.

“We are now entering the second year where we are likely to face sequestration. The health of the industrial base is a question that is near and dear to the department’s leadership interests,” said Elana Broitman, acting deputy assistant secretary of defense for MIBP.

The policy office is focused on vendors’ production capacity as well as the need to preserve or maintain a highly skilled, technically competent workforce. “In order to equip the warfighter, we depend upon a healthy industrial base that continues to innovate,” Broitman said. “The assessments of the industrial base that we do are an important tool in understanding how the industrial base will fare during this downturn.”

“We have to be aware of what’s happening with the industrial base with this country,” Rep. Mac Thornberry, R-Texas, vice chairman of the House Armed Services Committee, told a reporter for *Breaking Defense* on Nov. 22, 2013. “Whether you need a separate program to fund R&D or other things to keep some suppliers alive, I think that’s another question, but it’s worth asking.”

### POLICY OPTIONS

Army leaders often cite multiyear procurement contracts, foreign military sales (FMS) and industry outreach as examples of ways to support a prosperous path forward for industry.

Through the multiyear deals for the UH-60 Black Hawk utility helicopter and CH-47 Chinook cargo aircraft, the Army can help solidify and sustain production expertise while simultaneously maintaining production capacity. The



### PATRIOT DUTY

Soldiers with the 3rd Battalion, 2nd Air Defense Artillery Regiment perform a routine inspection of a Patriot missile battery at a Turkish military base in Gaziantep, Turkey, Feb. 27, 2013. Past DOD investment and FMS have been invaluable to the health of the Patriot program and IB, as well as to the security of allies such as Turkey. (U.S. Air Force photo by MSgt Sean M. Worrell)

Army also is continuing a variety of IB assessments to identify potential areas of difficulty or challenge. (See related articles on Pages 8 and 82.)

FMS, too, continue to have a strategic impact by helping to build partner capacity and, in some cases, sustain production capacity for a variety of needed technologies and systems. FMS have been a part of programs such as the Patriot missile, Guided Multiple Launch Rocket System and AH-64 Apache helicopter, among others. (See related article on Page 36.)

As an example of how these various approaches can come together, the Army has conducted IB assessments related to Abrams tank modernization at the Lima Army Tank Plant, OH, also called the Joint Systems Manufacturing Center. These efforts focused on maintaining needed production capacity as well as engineering and manufacturing expertise. FMS are a part of this calculus as well,

because there is an upcoming period of time in which the Army plans to temporarily pause its tank modernization line.

The Army works closely with the other services and Pentagon leadership to coordinate efforts and collectively develop mitigation strategies. If one of the services is producing a given technology, that may help another service maintain production capacity for a desired system.

### INFORMED DECISIONS

The MIBP office relies on a data repository created through a Pentagon-led multiyear IB assessment called Sector-by-Sector, Tier-by-Tier (S2T2). The S2T2 database looks at vendor capability, supply chain issues and manufacturing details regarding the production of critical components, platforms and technologies.

S2T2 is a starting point for assessments of all defense components. The information in S2T2 is used to manage DOD’s investments more effectively, to ensure



#### THE ABRAMS ANGLE

The Abrams tank IB is the focus of Army assessments related to modernization at the Lima Army Tank Plant, OH. The Army looked at how to maintain needed production capacity as well as engineering and manufacturing expertise. (Photo by SPC Christen Best)

a healthy IB for key sectors that are critical to future capabilities. All of the vendor-specific information is kept in strict confidence and is therefore not publicly available.

While still an ongoing project, most of the work of S2T2 is complete, Broitman said.

She described S2T2 as an invaluable resource. “With S2T2, we really delve deep into each tier of the supply chain in order to be accurate [as to] whether a particular company is critical, meaning if it goes away, no other company could fill its spot, so the entire supply chain is at risk,” she said. The S2T2 data repository includes a detailed examination of

relationships between second- and third-tier suppliers.

“The effect on these firms is especially important to emphasize, since a substantial portion, often 60-70 percent, of defense dollars provided to prime contractors is subcontracted,” states the 2013 MIBP report to Congress. “Many of these subcontractors, and their own suppliers, are small and innovative firms.”

#### POSSIBLE POINTS OF FAILURE

“Single points of failure” is another key phrase in the lexicon of Pentagon IB policymakers, who look for instances in which the ability to produce a certain product could go away. “On single

points of failure, we look at the fragility and criticality of the supply chain,” Broitman said.

She added that these points tend to be more common among products or technologies that are manufactured solely for DOD, meaning that there is no alternative commercial use or market for the product.

One analyst agreed, explaining that industries with a large commercial audience are likely to be more stable in what they can provide DOD during a downturn. “For example, you have a commercial airliner industry that is going really well. Companies without



diversification elsewhere [beyond DOD] will have a much harder time,” said Richard Aboulafia, vice president of analysis at the Teal Group Corp., a Virginia-based consultancy.

Aboulafia added that the Pentagon, in its examination of the IB, might want to emphasize individual companies on a case-by-case basis instead of taking a sector-by-sector approach, because there is significant diversity within sectors. One company in a given sector might be diversified with commercial products or multiple defense programs, whereas another may not, he explained.

At the same time, Broitman noted, an IB issue could emerge regarding a product available in parts of the world, but that the United States would like to ensure is produced domestically.

Another analyst wondered if single points of failure might, in reality, merely translate to market price increases for particular products.

“A single point of failure may become a price increase because there is almost always someone who will make something if the price is right,” said Benjamin H. Friedman, senior fellow in defense and homeland security studies at the Cato Institute, a Washington, DC-based think tank.

Friedman said globalization and the “netting” together of markets are likely to make DOD less dependent on one particular source of supply. He emphasized that the free-market would be well suited to address most IB issues.

“The more technically difficult or complex it is to produce something, the more we should worry about an ability to make it at low cost,” he added.



### KNOWLEDGE BASE

Harrow Miller, a heavy mobile equipment mechanic in the Turbine Drive Train Division at Anniston Army Depot, AL, assembles an AGT 1500 engine. Maintaining specialized skills in the IB, both organic and commercial, is a central concern for DOD. (Photo by Jennifer Bacchus, U.S. Army Materiel Command)

### MITIGATION STRATEGIES

Mitigation strategies also are a large part of the IB policy equation, wherein the Pentagon employs a particular approach to foster competition, sustain production or identify key areas of needed investment.

Such strategies may involve DOD investment in a particular product or area in order to preserve the supply chain and critical core capabilities.

DOD recognizes its responsibility to maintain a robust IB for the long term and to enhance industrial capacity “by investing in those defense unique items

that will support future acquisition programs,” the report to Congress states. Sequestration and longer-term budget cuts could limit capital market confidence in the defense industry. “Faced with this continued uncertainty, companies will be less willing to make internal investments in their defense portfolios or more likely abandon them altogether,” particularly smaller, innovative and niche-product companies with fewer resources to cushion the fiscal pressures, the report states.

This is where DOD can play a role. The report notes that earlier Pentagon decisions to invest in important IB





### INTERNATIONAL COOPERATION

PO3 Ryan Renneker grinds a blank flange for a seawater cooler on one of the diesel engines aboard the amphibious assault ship USS Makin Island in the Arabian Sea, March 1, 2012. The Army works closely with the other services and Pentagon leadership to coordinate IB efforts. If one of the services is producing a given technology, that may help another service maintain production capacity for a desired system. (U.S. Navy photo by PO1 David McKee)

technologies and capabilities when defense spending was on the decline led to pivotal programs such as the F-16, the Abrams tank, and the Patriot air and missile defense system.

“We’re not looking to invest forever,” Broitman said. “When we do this, it is a temporary solution. We need to know if, at the end, there is a way forward for the company without us.” DOD is careful to analyze the market to ensure that any investment will prove both relevant and worthwhile. It is important to keep pace with market changes and technological progress, Broitman said.

“We don’t want to spend money if a particular product will be moving to the next generation by the time there is an exit strategy,” she explained.

DOD has invested in a number of areas over the past several years to

preserve critical capabilities—for example, lightweight materials, GPS-related technologies, rocket components and battery items, Broitman said.

There are various avenues of funding for mitigation strategies, including use of the Defense Production Act and the DOD technology program ManTech, Broitman said.

“We try to do small, flexible, nimble investments,” she said.

### CONCLUSION

MIBP’s 2013 report to Congress warns against expectations that DOD will simply spend more on procurement to solve IB challenges. “Now, more than ever, buying products beyond what is required is not an option, no matter how much those products may protect key industrial base capabilities by generally exercising the entire industrial base,” the report states.

“We simply cannot pursue a strategy that ultimately results in solving ‘million dollar’ problems with ‘billion dollar’ solutions.”

Rather, DOD is weighing options along a spectrum between program cancellation and completed full-scale production. “These options include upgrading or extending the service life of existing programs, hovering or slowing ongoing programs, shelving or rolling over technology for future systems, executing planned low-rate procurements, and/or choosing silver bullet procurements of successful prototypes,” the report states.

Of those possible approaches, the report identifies two with the greatest promise for keeping the IB intact during long intervals between new major weapon program starts:

- Selective low-rate procurements, also known as block production.
- A hedging approach that produces a highly capable system with a high-technology operational advantage against current or near-term threats and, at the same time, forms a basis to build out larger production runs if necessary, while preserving critical human, manufacturing and technical capabilities.

For more information, go to <http://www.acq.osd.mil/mibp/>.

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# Preparing for the Next CONFLICT

The Army looks ahead in balancing resources,  
readiness of organic industrial base

*by COL Christopher Carlile*

**A**s the nation draws down from more than a decade of conflict, industrial facilities will continue to reset battle-worn equipment to meet the readiness requirements of the next conflict, just as they have reset millions of pieces of equipment and manufactured billions of rounds of ammunition and repair parts over the past 12 years. It is important that we retain the critical skills and talents of our dedicated workforce, even as the workforce shrinks to reflect the decreased demand for materiel, and ensure that the Army's organic industrial base (OIB) is correctly postured and aligned with the capabilities of the other services and defense industry.

"We don't know when the next contingency will occur, but we know there will be another contingency," said GEN Dennis L. Via, commanding general (CG) of U.S. Army Materiel Command (AMC). "History has taught us this, and the organic industrial base provides a tremendous capability to be able to surge to meet future requirements. Our challenge, going forward, is how do we sustain a minimum level of workload during peacetime operations and sustain the skill sets and capabilities to support the surge for the future?"

Parallel to the drawdown will be a decline in demand for munitions, repair parts and reset equipment, but the OIB must be ready to respond rapidly the next time it is called upon. The Army has a number of initiatives that will help protect the OIB's

national treasures by investing in their core competencies and creating new efficiencies.

## **RESPONSIVE, RELIABLE AND READY**

The 21 U.S. government installations that make up the OIB are prime partners in DOD's OIB complex, ensuring readiness for joint warfighters and their equipment.

The ammunition plants, manufacturing arsenals and maintenance depots of the OIB strive to provide responsive, reliable support whenever and wherever it is needed. OIB capabilities are vast and varied, from small-arms ammunition to U.S. Air Force bombs, from the manufacture of cannon tubes and mobile maintenance vehicles to the rebuild, recapitalization and modernization of helicopters, trucks and main battle tanks.

Many of the OIB facilities provide one-of-a-kind capabilities that would be very difficult to replicate anywhere else. Also, the heart of the Army's organic industrial sector—the more than 30,000 people, military and civilian, many of them skilled artisans—are not just the engine of the OIB, but also members of communities across the country. (See Figure 1 on Page 22.) The government facilities provide direct and indirect support to these communities through funding and jobs; for every dollar AMC invests in these facilities, there is a \$1.83 return.





***“THE ORGANIC INDUSTRIAL BASE PROVIDES A TREMENDOUS CAPABILITY TO BE ABLE TO SURGE TO MEET FUTURE REQUIREMENTS. OUR CHALLENGE, GOING FORWARD, IS HOW DO WE SUSTAIN A MINIMUM LEVEL OF WORKLOAD DURING PEACETIME OPERATIONS AND SUSTAIN THE SKILL SETS AND CAPABILITIES TO SUPPORT THE SURGE FOR THE FUTURE?”***

#### **A STRATEGY FOR THE FUTURE**

The “United States Army Organic Industrial Base Strategic Plan, 2012-2022”, signed in October 2012 by Undersecretary of the Army Joseph W. Westphal, provides a framework to shape OIB capabilities to meet current and future operational requirements. Whereas previous drawdown efforts dangerously degraded critical capabilities, threatening to hamper modernization of weapon systems including the UH-60 Black Hawk helicopter and M1 Abrams main battle tank, this new strategy focuses on making the necessary investment and capacity decisions to adequately preserve vital workforce and infrastructure resources.

The plan focuses on four key areas: ensuring the right-sizing of the workforce and facilities to meet core capabilities; making the necessary capital investments to preserve needed capabilities; aligning Army funding to maintain readiness of the industrial base; and leveraging private-sector capabilities.

Since the early part of this century, the Army has funded industrial base requirements through both the base

#### **WHITE HEAT**

A welder at Letterkenny Army Depot (LEAD), PA, is hard at work maintaining equipment needed by the warfighter. The Army OIB workforce manufactures, repairs and resets millions of pieces of equipment each year. (Photo courtesy of LEAD Public Affairs)



FIGURE 1



### THE ORGANIC INDUSTRIAL BASE

The 21 U.S. government installations—home to depots, arsenals, ammunition activities and munitions centers—that make up the Army's OIB are prime partners in DOD's OIB complex, ensuring readiness for joint warfighters and their equipment. (Source: AMC)

budget and the overseas contingency operations (OCO) budget. Most of the funding during operations in Iraq and Afghanistan came from OCO sources. To pay for higher priorities, the Army funded depot maintenance at approximately half of the critical requirements in the base budget.

Sequestration, continuing fiscal constraints and the drawdown highlight the need to clearly identify and resource core industrial base competencies and capabilities in order to size capacity properly against current and future requirements.

Requirements are under review at each industrial base installation to provide a baseline for the Army to properly align the workforce and infrastructures. Key to this effort is a close and continuous dialogue among the policy development, sustainment and acquisition communities to properly project and manage workload forecasts.

### INVESTING IN CRITICAL CAPABILITIES

Many of today's OIB facilities date to the 1940s and have reached or exceeded their expected service life. Over the past

six years, the Army has invested about \$1.4 billion in capital expenditures and construction for its depots and arsenals. Unfortunately, the Army has not invested in facility modernization at the same rate as in modernizing weapon systems. Facility investments are critical to maintain current standards for technology and the work environment.

A recent review of OIB facility requirements reflected the need for \$700 million to \$800 million per fiscal year over a 5- to 7-year period to make up for existing shortfalls. Recognizing that an

investment of this magnitude is not possible in a constrained budget environment, the Army has a more modest investment plan over 10 to 30 years to reduce the gap and be prepared to support the Army 2020 vision.

### LEVERAGING COMMERCIAL CAPABILITIES

The government and commercial industrial sectors must work more closely to provide capabilities that capitalize on their specific strengths. One ongoing effort is AMC's Public-Private Partnership program (P3). (See related article on Page 32.) The sustainment and acquisition communities are working closely to promote P3 opportunities that not only maximize capabilities, but also share investments and best business practices. These collaborative efforts will help stabilize expensing rates and reduce costs. In FY13, more than 180 partnerships generated more than \$203 million in revenue for the government.

The OIB is also using contracting to leverage partnership opportunities. In the ammunition community, for example, contractors that compete to run government-owned, contractor-operated (GOCO) OIB facilities are required to provide a contractual plan for how they would optimize the facility, such as by consolidating activities, reducing or eliminating excess capacity, and making capital investments.

This strategy has proven successful in several GOCO ammunition plants. At the Lake City Army Ammunition Plant, MO, for example, the potential capital investment by the contractor could total \$100 million over the 25-year life of the contract. With the anticipated reduction in government requirements for small arms ammunition, the contract will allow the contractor to use excess capacity



### SOFT SCRUB

Employees at Corpus Christi Army Depot (CCAD), TX, blast the bottom of a UH-60 Black Hawk helicopter using plastic media blast (PMB), a process that uses plastic instead of sandblasting for better cleaning. PMB is also less aggressive on metal while producing better results. Many OIB facilities provide one-of-a-kind capabilities that would be very difficult to replicate anywhere else, making them national treasures. (Photos by Ervey Martinez, CCAD)



### HOT STUFF

Metallurgists at the Rock Island Arsenal Joint Manufacturing and Technology Center (RIA-JMTC), IL, pour molten metal into a pattern that will be used for a system produced at RIA-JMTC. The center is home to the only remaining DA foundry. RIA-JMTC was designated a Center of Industrial and Technical Excellence by the secretary of the Army for foundry operations. (Photo courtesy of RIA-JMTC Public Affairs)





### ARTISANAL TANKS

Workers at Anniston Army Depot (ANAD), AL, reset a tank. The depot workforce is made up of skilled artisans and craftsmen, many second- and third-generation OIB workers. (Photo courtesy of ANAD Public Affairs)

to produce commercial ammunition, ensuring a “warm” base and a trained workforce that can respond quickly during contingencies.

### CONCLUSION

To be good financial stewards of our resources, we must accelerate the transformation of our OIB by making prudent investments in modern capabilities to ensure that it remains responsive and ready to support the joint warfighter. We must have processes and procedures in place to support an agreed-upon management framework that effectively balances resources and requirements.

The OIB workforce and infrastructure must be right-sized over time to meet reduced requirements, given constrained resources. Capital investment and military construction programs must be steady and consistent, supporting a comprehensive investment strategy to best maintain the equipment on which our men and women in uniform depend. Senior leaders in the Army and DOD must conduct recurring reviews, guided by program metrics, to effectively shape the direction and focus of the OIB.

*For more information on the “United States Army Organic Industrial Base Strategic Plan, 2012-2022,” go to <http://usarmy.vo.llnwd.net/e2/c/downloads/276549.pdf>.*

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# Bullet List

Joint Munitions Command's unique mission and capabilities magnify resource, readiness concerns

*by Mr. Jim Uribe and Ms. Linda Loebach*

In the manufacture of ammunition, Joint Munitions Command (JMC) operates a nationwide network of conventional ammunition manufacturing plants and storage depots, the core competencies of which include storage, distribution, demilitarization and production. Because ammunition is a unique commodity, it requires technical production accuracy to exact specifications and superior quality levels for the safety of its users.

JMC has legal and readiness requirements to retain a core nucleus of government-owned industrial plants on which it depends before relying on the private sector to supply the armed forces in time of national emergency or in anticipation of such an emergency. Fourteen government-owned, government-operated (GOGO) and government-owned, contractor-operated (GOCO) ammunition industrial sites produce superior-quality munitions for all U.S. military services and allies.

The ammunition organic industrial base (OIB) has capabilities and capacity not available in the commercial



## HISTORY LESSON

This piece of legacy equipment at the 72-year-old Lake City Army Ammunition Plant used to represent one step of many in the production of 7.62 mm ammunition. (U.S. Army photo)

sector. That includes the production of specialty chemicals that may reside in the commercial sector but for which commercial capacity is insufficient to

meet demand. Commercial capability can, and is likely to, be divested based on market conditions. In other words, a commercial manufacturer of ammunition



#### MEET THE NEW BOSS

In contrast to legacy tools, this new equipment completes all of the steps in the production of 7.62 mm ammunition at Lake City Army Ammunition Plant. (U.S. Army photo)

will not stay in business if ammunition procurements do not provide adequate return on investment.

OIB capacity and capability can expand to meet emergency or surge requirements for military readiness, or to meet unanticipated requirements.

An example occurred at JMC's Lake City Army Ammunition Plant, MO. Before 9/11, some refabrication of equipment and upgrades to infrastructure had begun at Lake City, where the antiquated facilities and equipment needed to be replaced or upgraded to modern specifications. After 9/11, the modernization accelerated.

Production quality improved and machine efficiencies increased, such that production capacity grew from 400 million rounds of small-caliber ammunition a year in 2003 to 1.6 billion rounds in 2013. Thus, Lake City became the only facility in the world with the capacity to fulfill the small-caliber ammunition demands of our service members at that critical time.

#### BENEFITS OF MODERNIZATION

Most of JMC's sites were established during World War II. JMC is keenly aware that, even with defense budget cuts, it is critical to maintain, yet even more crucial

to modernize, its ammunition industrial base to guarantee that ammunition is available and delivered to our service members when and where they need it.

Keeping facilities modernized enables JMC's industrial base to develop new technologies, such as the environmentally friendly, small-caliber Enhanced Performance Round (EPR), which provides soft-target consistency as well as hard-target penetration, and extends the range at which the EPR performs to these improved standards.

JMC's objectives are to enable modernization while continuing to meet the





### OUT WITH THE OLD

This outdated Nitric Acid Concentration/Sulfuric Acid Concentration (NAC/SAC) facility at the 72-year-old Radford Army Ammunition Plant has been demolished. It had exceeded its projected useful life. During the latter part of that life, the facility had frequent downtime and presented significant challenges to the work environment. (U.S. Army photo)

needs of the service member; to increase operating efficiencies; to improve product quality; to reduce cost; to improve operational safety and process reliability; to maintain environmental compliance; and to enhance the work environment of installation employees.

For example, Radford Army Ammunition Plant, VA, needed a new acid facility for the manufacture of high-quality

nitrocellulose, the principal ingredient in the propellants used in munitions for all the services. A new acid plant built in 2010 realized cost savings in the areas of raw materials, energy consumption, waste reduction, maintenance and support services. The plant also realized cost avoidances related to equipment failures, production interruptions and nonconforming product. In addition, the level of nitrate wastewater was reduced.

### READY ACCESS TO CAPABILITIES

JMC's experience has shown the value of maintaining government-owned production capacity. For example, Holston Army Ammunition Plant, TN, produced concentrated nitric acid (c-NA), a chemical used in making explosives, until 1998 in the No. 5 Magnesium Nitrate, or "Maggie," system. In 1999, a new contractor took over operation of the facility and purchased c-NA from El Dorado Chemical Plant in Arkansas more cheaply than it cost to make it. So JMC halted production with Maggie, but maintained the capability as a risk mitigation or contingency option in case the c-NA supply were ever insufficient.

Then, in 2012, an explosion at El Dorado destroyed the plant's c-NA production capabilities. No other source in the continental United States could meet DOD requirements, so the U.S. Army Joint Munitions and Lethality Life Cycle Management Command reactivated Maggie. This reactivation averted a production shutdown at the Holston plant that would have stopped the supply of high explosives needed for DOD munitions. Furthermore, it might have taken years, instead of months, to reestablish c-NA production capability.

Two-thirds of all ammunition end items rely on an organic producer for at least one component, underscoring the importance of maintaining the unique capabilities of the U.S. ammunition OIB.

For example, the nitrocellulose produced at Radford Army Ammunition Plant supports more than 80 percent of lethal weapon systems in both the heavy and infantry brigade combat teams. In fact, the plant's nitrocellulose is the key component of all single- and multibase solvent propellants and solvent-less propellant



#### IN WITH THE NEW

A new, modernized NAC/SAC facility was constructed at Radford Army Ammunition Plant in 2010. It provides acid for nitrocellulose used to make ammunition for all service members. (U.S. Army photo)

used in DOD's small-, medium- and large-caliber ammunition. The explosives produced at Holston support weapons such as bombs, missiles, rockets, artillery, demolition, grenades, mortars, Navy guns and tanks, as well as small- and medium-caliber ammunition.

#### CONCLUSION

In short, many of the capabilities that exist at JMC's organic facilities can be found nowhere else. Replication of these facilities would be prohibitive economically, environmentally and in terms of the cost to acquire the necessary amount of land in safe locations.

Maintaining and modernizing this vital OIB will allow JMC to develop, produce and deliver the munitions and force-protection materiel that U.S. service members and their allies need.

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# The Ammunition

## Government-Owned, Government-Operated

**ANNISTON MUNITIONS CENTER, AL**—Established in 1941. Manages Terminal High-Altitude Area Defense storage and missile testing, maintenance, demilitarization and disposal. An Integrated Logistics Strategy (ILS) archive installation, Anniston provides the joint services with deep storage and demilitarization of conventional ammunition and missiles. Performs supply depot operations (SDO) logistics functions for 68,000 conventional ammunition short tons and 29,000 missile short tons.

**BLUE GRASS ARMY DEPOT, KY**—Established in 1941. DOD's primary center for surveillance, receipt, storage, issue, testing and repair for the Chemical Defense Equipment Program. Produces such items as the 60 mm and 80 mm mortar fin, confidence clip for the grenade fuze retrofit for JMC, and class V (CLV) and non-class V components, kits and devices. Southeast region ILS distribution installation, providing the joint services with conventional ammunition out-load—the ability to send stored ammunition that the warfighter requires—with a contingency out-load capacity of 26,530 containers.

**CRANE ARMY AMMUNITION ACTIVITY, IN**—Established in 1977. Its unique capability is the production of pyrotechnic flares, candles, naval smoke and signal devices, C4 extrusion, Navy gun load, assemble and pack (LAP), and metal fabrication of CLV and non-CLV components, kits and devices; this includes high-explosive (HE) press loading for naval projectiles, and melt-pour operations to load burster charge assemblies for 155 mm artillery and 120 mm mortar rounds. Midwest region ILS distribution installation, providing the joint services with conventional ammunition out-load; has a contingency out-load capacity of 25,372 containers.

**LETTERKENNY MUNITIONS CENTER, PA**—Established in 1977. Manages testing, maintenance, demilitarization and disposal of tactical missiles and conventional ammunition. Northeast region ILS distribution installation. Provides Army air defense and Air Force intercept missiles support.

**MCALESTER ARMY AMMUNITION PLANT, OK**—Established in 1943. The nation's largest ammunition storage depot, it also produces, renovates and maintains conventional ammunition and related components. Performs LAP function for general- and special-purpose penetrator bombs, projectiles, cartridge assembly, Navy prop charges and the Sensor Fuzed Weapon. It is the sole Air Force and Navy bomb producer. Inspects and repairs rail lines at other government facilities. Southwest region ILS distribution installation.

**PINE BLUFF ARSENAL, AR**—Established in 1941. Produces smoke, illumination, incendiary munitions and chemical/biological defense equipment. Sole DOD capability for white phosphorus, red phosphorus pellets, rubber extrusion and forming, incendiary mix and fill, smoke grenades, large filter fabrication, decontamination kit production, protective mask production and rebuild, and bio-consumables. Has the full spectrum of large-caliber LAP capabilities, from 60 mm to 155 mm. ILS archive installation, providing the joint services with conventional ammunition deep storage.

**TOOELE ARMY DEPOT, UT**—Established in 1945. Designs and manufactures ammunition peculiar equipment used in demilitarization of munitions for DOD. Northwest region ILS distribution installation.





# OIB at a Glance

## Government-Owned, Contractor-Operated

**HAWTHORNE ARMY DEPOT, NV**—Established in 1930. Largest munitions storage depot in the JMC enterprise, with nearly 3,000 magazines and 7.6 million square feet of covered storage. Provides archival storage and unparalleled demilitarization capacity, both critical to the JMC mission. Securely stores the National Defense Stockpile's consolidated inventory of elemental mercury.

**HOLSTON ARMY AMMUNITION PLANT, TN**—Established in 1942. DOD's single point of failure—the one qualified producer—for explosives. Other capabilities include production of specialty explosives and chemicals, as well as development and production of insensitive munitions.

**IOWA ARMY AMMUNITION PLANT, IA**—Established in 1941. Produces medium- and large-caliber ammunition items for DOD. Core capability includes the ability to LAP ammunition items including 120 mm tank, 40 mm HE/velocity and missile warheads. The only DOD installation capable of HE melt-pour, making it the prime source for HE artillery and mortars.

**LAKE CITY ARMY AMMUNITION PLANT, MO**—Established in 1941. Manufactures small-arms ammunition and associated explosive/pyrotechnic materials. Produces 20 mm electric primers, all DOD small- and medium-caliber links, and LAP 20 mm ammunition.

**MILAN ARMY AMMUNITION PLANT, TN**—Established in 1941. Core capability is to LAP ammunition items. Currently modernizing to support future tenants.

**RADFORD ARMY AMMUNITION PLANT, VA**—Established in 1941. Manufactures and is the sole producer for nitrocellulose, used in nearly all rifle and gun propellants. Sole producer of solvent-less propellant, used in rocket and missile propulsion systems.

**SCRANTON ARMY AMMUNITION PLANT, PA**—Established in 1951. Manufactures large-caliber metal projectiles. Can produce 120 mm mortars, 105 mm artillery projectiles, the 5-inch, 54-caliber Navy gun round, and 155 mm artillery projectiles. Sole producer of the 155 mm M795 Hi-Frag artillery projectile.

—MR. JIM URIBE

# The Promise *of* PARTNERSHIPS

AMC works to preserve OIB capabilities through cooperative arrangements with industry and others

*by Mr. Mark L. Morrison*



**A**mong the challenges faced by the Army's organic industrial base (OIB), as it transitions from combat to sustainment, is allocating diminishing workload within the depots and arsenals of the U.S. Army Materiel Command (AMC). Capitalizing on private-sector capabilities through public-private partnerships (P3), such as work share, teaming, direct sales, facility use and leasing, is one key way to preserve the OIB's unique capabilities while ensuring its viability as an enterprise in the near term and its long-term ability to meet surge requirements.

To support the warfighter during the past 12 years, AMC has invested in tooling, specialty equipment, training and the professional development of a deployable, skilled and award-winning OIB workforce. Among the honors AMC has received are 27 of 47 Shingo awards; Lean Six Sigma and value engineering awards; selection as a Reuters Top 100 Global Innovator; Secretary of Defense Environmental awards; and presidential rank and civilian service awards.

P3s enable our partners to take advantage of these investments, capabilities and workforce skills. Partnerships provide access to advanced technology; state-of-the-art equipment; secure AMC facilities that are ISO (International Organization for Standardization)-certified and comply with Occupational Safety and Health Administration regulations; the potential use of hard-to-obtain hazardous waste permits; and Lean Six Sigma processes. Partnerships also allow industry to leverage long-term use agreements and reduce their capital investment and overhead costs.





#### PARTNERS

Public-private partnerships could be a lifeline for critical industrial base capabilities.  
(SOURCE: Videodet/photos.com)

For the Army, P3s offer the benefits of improving operational efficiencies, lowering costs of products and services, accelerating innovation, sustaining critical skills and capabilities, and ultimately reducing our expensing rates, thus making our depots and arsenals more cost-competitive. In FY13, AMC had 205 partnerships, representing total revenue of \$203 million while sustaining 1,800 jobs. (See “Conserving Capabilities,” Army AL&T magazine, January-March 2013, Page 160.)

#### CHALLENGES

DOD has endorsed the continued use of partnerships as a critical part of President Obama’s national security strategy. In a July 2012 report to the secretary of the Army, the Defense Business Board, tasked with providing recommendations on how to exploit the benefits of these partnerships more fully, noted: “Public-Private

Collaborations leverage the resources of the private sector and other collaborating agencies and allies. As the department enters a decade of austerity, collaborations are a cost-wise process that usually results in a significant return on a relatively modest investment.”

The same report also noted department-wide challenges that can undermine partnership efforts. Top among the challenges DOD faces is that there is no overarching P3 doctrine, no standard approach for industry-DOD partnerships. Consequently the private sector does not know how to go about partnering.

AMC’s experience echoes some of those themes, notably the lack of a standard approach to partnering. Currently, AMC organizations are as diverse in their P3 approaches as each installation’s capabilities. As GEN Dennis L. Via, AMC

commanding general (CG), has observed, “Fostering partnerships calls for a more responsive approach on AMC’s part.” The private sector is a fast-moving entity that calls for a receptive and timely government response.

#### A STANDARD APPROACH

To address these concerns, AMC is working on a new business development strategy that will focus on the benefits and pitfalls of partnering, to establish a standard approach to attracting partnerships and reaching agreements.

The new business development plan will lay out a standard policy, metrics, tools and training that will enable the OIB to speak with one language when it comes to attracting new business. As the plan is finalized, the focus is on standardizing efforts and applying the required levels of AMC attention and resources at all sites.

### TOOELE TIME

GEN Dennis L. Via, center right, AMC CG, attends a demonstration of the alternative energy site at Tooele Army Depot (TEAD), UT. Via encouraged TEAD management to continue their marketing efforts, especially for TEAD's unique capabilities. (U.S. Army photo)



In devising this new approach, AMC examined where and how partnerships have worked especially well. The most successful arrangements have developed when the collaboration took a “triad” approach. This method includes a business development professional, legal advisor and contracting officer at the initial stages of a relationship, as follows:

- Business development, to reach out with the concept of partnering, determine scope and garner concept approval.
- Legal, to analyze the environment and bring a solid understanding of applicable law, regulation and policy, with the aim of maximizing flexibility to the business development professional and the contracting officer.
- Contracting, to determine the best interests of the government and thus ensure that the partnering effort achieves its stated goals through rock-solid agreements and supporting

documents that define applicable terms and conditions such as direct labor structure and costs.

### CONCLUSION

Not only is integrated coordination a must from the beginning of a partnership, but AMC needs to go even further by looking toward a larger definition of partnership. Beyond the traditional arrangements with industry and small business, partnering should involve a



larger concept of “public” that includes other services, the Defense Logistics Agency and other countries as well.

In addition, the continued growth in foreign military sales (FMS) offers a promising venue for partnerships. In FY13, FMS support resulted in \$190 million in revenue for the OIB.

Our industrial capabilities and capacities should make us an attractive partner. Ultimately the best, most successful partnerships are those that add value to the OIB and bring profit to the private-sector partner. We must team with industry to create win-win opportunities.

As AMC’s new business development plan advances, its rapid execution will support the preservation of unique OIB capabilities, so that the OIB can remain effective, efficient and poised to provide the timely, high-quality support that our warfighters have come to expect and demand.

*For more information, contact the AMC G-3/4 Industrial Base Capabilities Division at 256-450-7087 or Ramon Campos at [Ramon.Campos.civ@mail.mil](mailto:Ramon.Campos.civ@mail.mil).*

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#### PARTNERS IN WEAPONRY

BG Kristin K. French, left, commander of the Joint Munitions and Lethality Life Cycle Management Command and Joint Munitions Command, examines the Sensor Fuzed Weapon produced at McAlester Army Ammunition Plant (MCAAP), OK, as David Higgins, MCAAP site leader for Textron Defense Systems, explains its operation. The weapon is produced by MCAAP under a contract with Textron Defense Systems. COL Joseph G. Dalessio, MCAAP commander, is at right. The visit was the general’s first to MCAAP after assuming command of its higher headquarters in July 2013. (Photo by Lea Giaudrone, AMC)



#### CRITICAL SKILLS

Charles Chatman overhauls an X1100 transmission used in the M1 family of vehicles at the Powertrain Transmission Facility of Anniston Army Depot, AL. P3s leverage the skills of workers such as Chatman along with the resources of the private sector. (U.S. Army photo by Mark Cleghorn)

# Global Strategy

International sales are increasingly important to the defense industrial base

*by Mr. Ron Murawski and Mr. Christopher J. Mewett*

**T**he prospect of a significant and sustained decrease in procurement funding—the combined effects of the Budget Control Act and the subsequent sequestration—is troubling not only to DOD and the services, but also to the domestic defense industrial base that is sustained by federal government business.

Now more than ever, the military departments are seeking opportunities for international cooperation to provide a lift to U.S. acquisition programs, extend production lines and defray costs by keeping critical segments of the industrial base “warm.” Industry is our natural partner in this effort as American defense companies look to overseas markets to make up for lost government business, sustain growth, maintain critical manufacturing capabilities and retain the skilled workforce on which we depend to build the world’s best military equipment.

Overseas demand for American defense articles remains strong, both through government-brokered foreign military sales (FMS) and through direct commercial sales (DCS) by industry. Security cooperation—long understood primarily as a way to build relationships, reinforce alliances and enhance the defense capabilities of our foreign partners—must now also be seen as a means to provide leverage for U.S. acquisition efforts and to support the domestic defense industrial base.

The success of the Army Security Assistance Enterprise, led by the deputy assistant secretary of the Army for defense exports

and cooperation (DASA(DE&C)), will depend increasingly on the support we’re able to provide both to the Army’s acquisition objectives and to the industrial base that enables us to meet them. This includes the commercial industrial base (generally, private-industry companies) and the organic industrial base (including the Army’s arsenals, depots and ammunition plants).

## EXPANDING OPPORTUNITIES

The basis of FMS is that the United States is procuring goods, services and training on behalf of a foreign government. If a company already sells goods to DOD, those products may be well-suited for FMS.

The FMS program allows a company to expand its market internationally while using the same procurement procedures already in place for sales to DOD. In addition to the system itself, items that are considered in a total FMS package include training, technical assistance, initial support, ammunition and follow-on support. Training is particularly important in order to provide advice, technical assistance and support to personnel of the purchasing nation. This assistance is provided to meet specific objectives in connection with the development of a country’s capabilities.

The Army manages sales of a wide array of equipment to allies, including equipment it uses, such as the UH-60 Black Hawk and AH-64 Apache helicopters, which are among the biggest sellers in the Army’s FMS program, and non-standard equipment that the Army never used or no longer uses. The UH-1





#### SHARED CAPABILITIES

Australian Army infantrymen march to a CH-47 Chinook helicopter July 20, 2013, at Shoalwater Bay Training Area, Queensland, in support of Talisman Saber 2013, a joint U.S.-Australian military exercise. FMS have helped to sustain production of the Chinook, among other Army programs. (U.S. Army photo by Jeffrey Smith)

Iroquois helicopter, or “Huey,” used during the Vietnam War is considered non-standard now, for example.

Each of these programs has played a part in a massive surge in Army FMS over the past decade. The security cooperation community has had to adapt to a “new normal” in the scope and overall value of the FMS program, with new sales skyrocketing from \$3.4 billion in FY03 to a record high of \$24.2 billion in FY09 and averaging \$18 billion annually over the past four fiscal years. Much of this increase is due to operations in the U.S. Central Command area of responsibility, where military forces are being reconstituted, where coalition partners have seen the need for military goods suitable to the conflict, and where

other nations have seen the value of our battle-tested and proven equipment.

Major international sales have helped to sustain production of a number of Army programs in recent years, including the Apache, the CH-47 Chinook helicopter, the Patriot missile system, Excalibur 155 mm precision-guided artillery shells, the Guided Multiple Launch Rocket System and Javelin antitank missiles.

In some cases, FMS can even revitalize an entire program: A significant purchase in 2009 reestablished a warm production line for the modernized Patriot missile system and provided development investment to resolve obsolescence issues in older systems. These benefits compounded the most obvious boon: the award of a major production

contract for the first Army-managed new production of Patriot ground equipment in more than 15 years.

Another successful FMS venture involved the sale of 1,026 refurbished M113A2 armored personnel carriers. From 2011 to 2012, Army employees at the Anniston Army Depot (ANAD), AL, worked closely with defense contractor BAE to refurbish the U.S. government-owned vehicles. Providing these excess defense articles through the FMS process and having them refurbished through the public-private partnership between ANAD and BAE resulted in cost avoidance for the U.S. government through divestiture of the vehicles. The refurbishment also resulted in hundreds of thousands of core hours of work at



### DUTCH MASTERS

The Royal Netherlands Air Force has been purchasing AH-64 Apache helicopters since 1995. Other countries that have procured the aircraft include the United Kingdom, Saudi Arabia, Japan and Taiwan. (Photo courtesy of Wikimedia Commons)

ANAD and kept the skill base exercised in repairing the vehicles at a key organic industrial base facility.

The Security Assistance Training Management Organization (SATMO), a subordinate command of the U.S. Army Security Assistance Command (USASAC), recently conducted seven weeks of instruction on reconnaissance and surveillance operations for an African nation.

The training that SATMO conducts for foreign partners is unique in that it takes place in the requesting country, is tailored to meet specific training needs and is adapted to that country's military structure and culture. The forces trained were some of the more experienced personnel from the country's land forces, which also conduct border frontier patrols.

### SHORING UP THE BASE

In the postwar environment of recent years, with declining budgets, it has become more difficult for the Army to sustain an industrial base capable of readily meeting the needs of the warfighter. Companies and organic facilities have declining workloads, making it more difficult to maintain critical design and manufacturing capabilities. Particularly in the commercial industrial base, there has been a migration of engineers and scientists from defense-related sectors where workload is decreasing to other business sectors where more work exists.

The FMS program offers these benefits to the organic industrial base:

- Reduction in DOD acquisition costs—Increased production volume results in

**THE TRAINING THAT SATMO CONDUCTS FOR FOREIGN PARTNERS IS UNIQUE IN THAT IT TAKES PLACE IN THE REQUESTING COUNTRY, IS TAILORED TO MEET SPECIFIC TRAINING NEEDS AND IS ADAPTED TO THAT COUNTRY'S MILITARY STRUCTURE AND CULTURE.**

more competitive prices and lower unit costs. Examples include more competitive prices for the 155 mm and 120 mm shell body metal parts at the Scranton Army Ammunition Plant, PA, more competitive prices for small-caliber ammunition and a reduction in unit cost for 2.75-inch hydra rockets.

- Greater likelihood of maintaining a warm base—Increased business means that production lines and shipping depots are more likely to stay open and active. Examples include maintaining viable infrared and visible light artillery and mortar production lines, along with an experienced workforce, at the Crane Army Ammunition Activity, IN; and maintaining red and white phosphorous artillery and mortar production capabilities, along with an experienced workforce, at the Pine Bluff Arsenal, AR.
- Replenishment of stockpiles when it is necessary to sell existing stocks to meet the demands of partner nations that have urgent requirement for items with a long lead time in production. There





#### KEEP IT WARM

Ken Ferguson attaches heater brackets to an M113 armored personnel carrier at ANAD's Combat Vehicle Repair Facility. FMS of 1,026 M113s, refurbished through a public-private partnership between ANAD and BAE Systems, resulted in a storage and demilitarization cost avoidance for the United States and in valued repair work for ANAD. (Photo by Jennifer Bacchus, U.S. Army Materiel Command)

may also be mandatory drawdowns from stock in order to supply humanitarian assistance needs to a partner nation in times of disaster. These stock sales or drawdowns later result in an Army buyback, replenishing the Army stockpile through new production of replacement stocks of like items that fulfill Army requirements.

Keeping production lines warm and filling production gaps mean that the production line, along with the extensive network of subcontractors and lower-tier contractors that supply it with parts, are still making products or are ready to do so with minimal startup costs. It's expensive to keep laborers employed and systems in place

where sufficient workload doesn't exist. Once a manufacturing system shuts down, it's difficult to start it back up when demand reappears, and expensive to rehire employees and retool lines to restart production.

Additional work generated through FMS also helps to slow the migration of engineers and scientists from the defense sector.

#### SUPPORT FOR LICENSING

While perhaps less visible and well-known than the service's role in government-to-government sales, the Army also plays a part in DCS by facilitating the licensing process for proposed defense exports. When an American company seeks to

market or sell defense articles abroad, it must get an export license from the U.S. State Department's Directorate of Defense Trade Controls. If the proposed export affects U.S. Army equities—for example, if it concerns an item or technology over which a specific Army organization has cognizance, or if the proposed export could impact our forces in the field—the license request is staffed through the Defense Technology Security Administration to the Army.

DASA(DE&C) licensing analysts consult with subject-matter experts across the service, review precedent for similar exports and develop an Army position on the proposed export. This position might offer some limiting provisos to ensure

## OFF TO JORDAN

High Mobility Multipurpose Wheeled Vehicles are prepared for transport to Port Aqaba, Jordan, in support of an FMS case facilitated by USASAC. The vehicles were for use by the Jordan Armed Forces. (U.S. Army photo)



that the item satisfies technology-security and foreign disclosure considerations. In this way, the Army helps to promote the sale of American defense products abroad while ensuring protection of U.S. forces' technological advantage.

DASA (DE&C) personnel processed more than 8,000 export license applications in FY13.

## CONCLUSION

There is a continuing interest among our international partners to purchase Army products and services. To sustain that demand, the Army and DOD must continue to provide high-quality products, training and service as our nation builds strategic partnerships through FMS.

In particular, there is a growing demand for training, and the Army sees this as an opportunity to build stronger relationships with allies and partner

nations. When the Army facilitates the sale of military weapons and hardware to partner nations, the training and support packages that the United States also sells to those customers help to secure an ongoing relationship between the Army and the partner military.

With FMS, there are interrelated benefits to the buyer, producer and U.S. government. The buyer gets the desired equipment and guidance, the producer gets increased work and revenues, and the U.S. strengthens its military-to-military ties with the new owner through training opportunities and increased equipment interoperability.

For more information, go to <http://www.army.mil/info/organization/usasac/>.

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# FaC-torial ANALYSIS

Fragility and criticality risk assessments help  
promote sound supply chain

*by Mr. Brad Nelson and Ms. Caroline McCarthy*

Over the past decade-plus of war, many of the systems on which the military depends have increased exponentially not only in effectiveness, but also in complexity, requiring an industrial base (IB) with sophisticated, specialized skills and capabilities. As DOD contemplated postwar needs and declining budgets, it became clear that the military had to understand what the most fragile but critical of these capabilities were, and where they resided.

To pinpoint these factors, DOD established a team to identify, analyze and resolve current and potential issues with key industrial capabilities. In 2012, the Office of the Undersecretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)) directed a Sector-by-Sector, Tier-by-Tier (S2T2) assessment of the defense IB. The effort included a series of 10 fragility and criticality (FaC) assessments across multiple IB sectors and uniformed services in FY13.

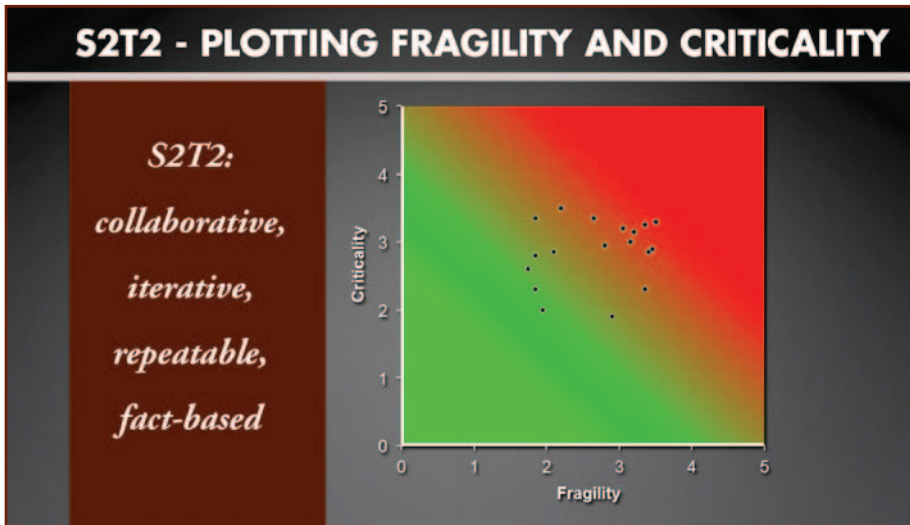


## MANY PIECES TO CONSIDER

As part of the WIN-T Inc 1 network, joint network nodes provide the Army with high-speed, high-capacity network communications. WIN-T Inc 1 is the Army's tactical communications network backbone, providing high-speed, high-capacity network communications to current and future forces. (U.S. Army photo)



FIGURE 1



#### BOILING IT DOWN

In the WIN-T FaC assessment, stakeholders and other SMEs from program offices and their suppliers used a structured, repeatable process to validate the FaC factors of each item under review. The group scored the items on a scale of 1 through 5 for each of the factors, then plotted those scores on a chart for further analysis. (SOURCE: OSD)

The first program FaC assessment, conducted on the M1 Abrams tank in FY12 as a pilot, demonstrated the importance of working with the M1 program office and outside experts to incorporate their perspectives on particular technologies and industry segments. The M1 assessment process became the model for the follow-on FY13 FaC assessments. Similarly, lessons learned from the FY13 assessments will be applied to additional assessments in 2014 and beyond.

In December 2012, DOD leadership identified the Warfighter Information Network – Tactical Increment 1 (WIN-T Inc 1) program as the second program for a FaC assessment. WIN-T Inc 1 is the Army's tactical communications network backbone, providing high-speed, high-capacity network communications to current and future forces. For purposes of the assessment, WIN-T Inc 1 is

representative of command, control, communications and computer (C4) systems as a whole; it provides a broad and detailed portrait of the current state of the C4 IB. In turn, that portrait has potential utility across multiple other sectors and programs, aiding in portfolio analysis as a part of DOD's budget process by providing insight on how to improve investment decisions and tailor investment policies to preserve essential capabilities.

Identifying specific stressors on the defense IB caused by reductions in DOD spending can minimize their impact in the future, helping to preserve key industrial capabilities for future acquisition. For this reason, DOD recognizes that only a few critical IB capabilities are truly fragile and are therefore in danger of disappearing without dedicated efforts to sustain them, such as program adjustments or investment.

Pinpointing and evaluating these key capabilities in the IB will enable the services to continue fielding the products and services needed to succeed in current and future missions. Understanding potential risks to the IB can help prepare the DOD for future supply chain fluctuations caused by reduced operations tempo (OPTEMPO) and a tightening fiscal environment. It also facilitates fiscal responsibility and wiser investment decisions.

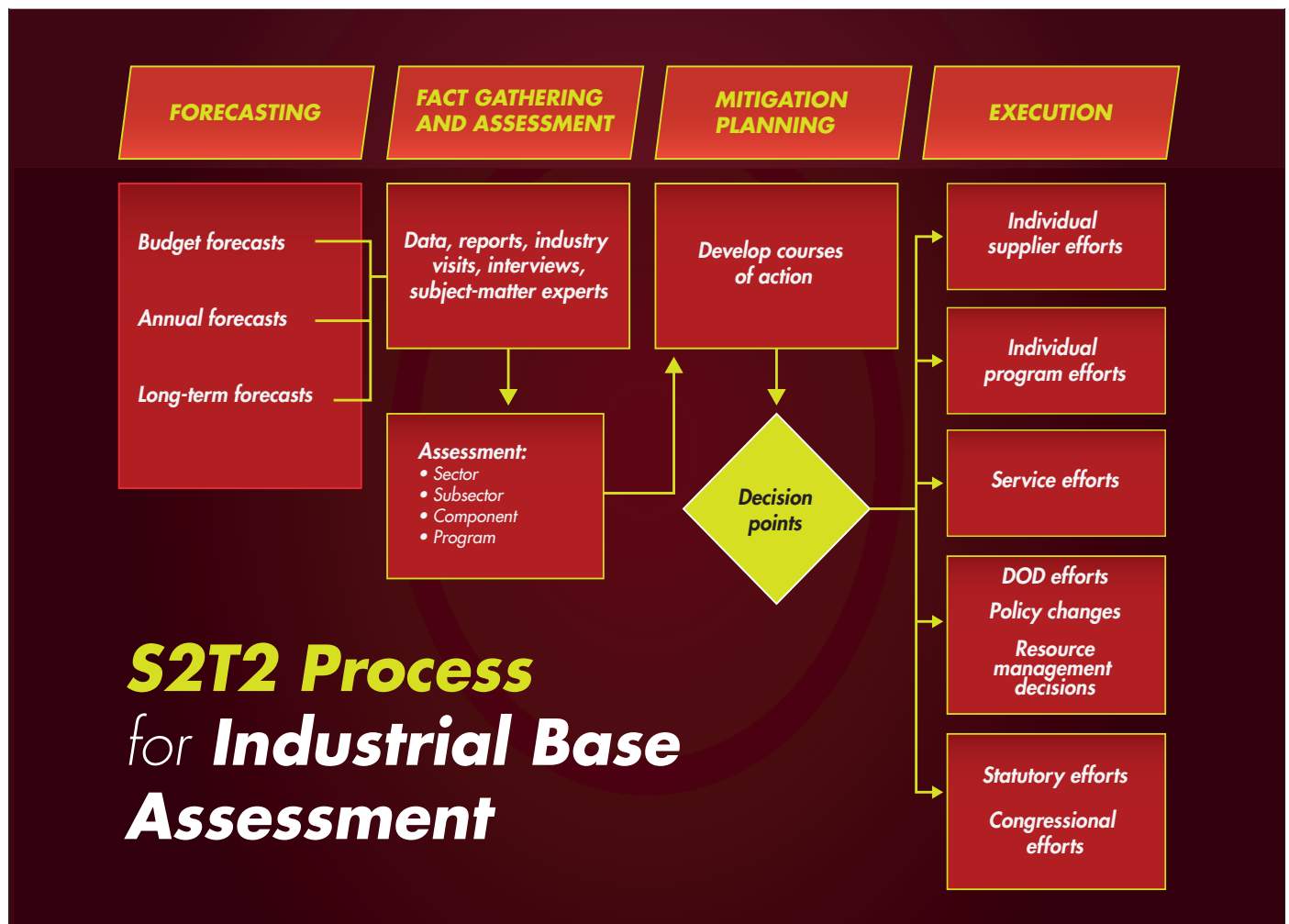
#### FaC DEFINED

FaC is a measure of risk and can be compared to two familiar risk variables—probability and consequence. When assessing risk, program managers consider the probability that an event will occur, and the consequence should that event occur. Fragility characteristics address the likelihood of IB disruption. Criticality characteristics address the difficulty of replacing a specific product or service if disrupted. (See Figure 1.)

The USD(AT&L) Joint Industrial Base Working Group (JIBWG), of the Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy (MIBP), developed a list of factors to evaluate FaC. The six factors for fragility include such potential risks as manufacturers' financial outlook—one reason a company may exit a market—and DOD dependence, which considers DOD sales for a company relative to the company's total global sales. Taken together, the fragility factors help DOD understand whether it will receive what it needs, when it needs it from the current provider(s) and the existing market.

The nine factors for criticality include issues such as reconstitution costs, which examine the impact on DOD to restore a specific capability if lost, and the intensity of design, which examines the degree

FIGURE 2



#### ASSESSMENT APPROACH

Given postwar needs and declining budgets, the military developed a painstaking process to evaluate what the most fragile but critical IB capabilities are, and where they reside. The information derived from the FaC assessments can inform multiple defense decision points, including resource allocation and milestone decisions, program actions and the need for legislation. (SOURCE: OSD)

to which defense-specific knowledge may be necessary to reproduce a capability, an alternative to the capability or the next-generation design. Criticality factors help DOD recognize which capabilities are most difficult to replace or restore.

The Office of the Secretary of Defense (OSD) works with the services to provide

information from its FaC repository as needed. Because of the sensitivity of IB data, there are safeguards for FaC assessments to avoid potential conflicts of interest and protect the integrity of the process. Thus, members of the FaC teams ensure that information does not leak to the public and is not used for other purposes within the government, such as

source selections, contract negotiations, subcontractor breakout or audits.

Knowing upfront how the FaC factors apply to DOD products and services not only helps home in on potential problems, but also serves as a common framework to assist DOD leadership in comparing industrial capabilities across all sectors





#### A BAROMETER OF C4

Soldiers train at the WIN-T Inc 1 Colorless Core Upgrade Regional Training Site 2 at Fort Drum, NY, in June 2013. As part of the FaC assessments, WIN-T Inc 1 is representative of C4 systems, one of the sectors of the defense IB, and therefore provides an overarching snapshot that is useful across multiple programs. (U.S. Army photo by Lawrence Holgate)



#### SUSTAINING CAPABILITIES

SSG Franklin T. Pangelinan of 1st Battalion, 294th Infantry Regiment, Guam Army National Guard watches civilian traffic in downtown Kabul, Afghanistan, and radios activity to his convoy Oct. 29, 2013, en route to Camp Phoenix on the outskirts of the city. The Army relies on the C4 IB to supply communications capabilities such as Pangelinan uses. (Army National Guard photo by SGT Eddie Siguenza)

and tiers of the IB. As a result, DOD leadership can evaluate combined scores for industrial capabilities across multiple programs, allowing for portfolio analysis as part of DOD's budget process.

Specifically, the information derived from the FaC assessments can inform multiple defense decision points, both before and during their execution, including program objective memorandum (POM) resource allocation and milestone decisions; unique issues such as the discovery of counterfeit parts; and ongoing issues such as an unforeseen sudden ramp-up of military capability. (See Figure 2.)

Findings from the FY13 FaC assessments are being helping the FY15 POM issue teams address concerns about the impact of declining budgets on the defense IB. By studying WIN-T Inc 1 and the other chosen capabilities and sectors, the FaC assessment teams collect and analyze a variety of data to come up with a snapshot of negative impacts within the supply base. This IB "blueprint" will help provide a sound and fiscally responsible foundation to reduce risk and promote wise investment decisions.

It is important to note that a FaC assessment is not an audit or inspection but a collaborative effort of OSD, the services and programs. The WIN-T Inc 1 FaC assessment team members included personnel from Project Manager (PM) WIN-T and its parent organization, the Program Executive Office Command, Control and Communications – Tactical (PEO C3T), together with the OSD MIBP office; the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology; the U.S. Army Communications-Electronics Command; the U.S. Army Materiel Command; the U.S. Army Research, Development and

Engineering Command's communications and electronics center; the Defense Logistics Agency; and the Defense Contract Management Agency.

### THE FaC PROCESS

The FaC assessment process follows the same set of steps, whether conducted for a sector or for a program such as WIN-T Inc 1. In the initial step, DOD leadership and the JIBWG members identify possible defense IB concerns and candidates for assessment.

After DOD leadership selected WIN-T Inc 1 for assessment, MIBP identified relevant stakeholders and established a working group. The working group collected and assessed the preliminary information on products and suppliers. With input from stakeholders, they narrowed the host of products down to those items for which there could be fragile and critical IB issues. For example, there are thousands of parts in the WIN-T Inc 1 system; some parts are at higher risk than others.

The working group institutes a set of "screens" based on the FaC factors to identify those at potentially higher risk. For example, unique, highly specialized equipment is much more likely to pose an IB issue compared with common parts used across several sectors. The criticality-fragility matrix is a first cut at IB analysis and specific sustainment investments, which will require additional evaluation.

In the next core activity of the WIN-T FaC assessment, a panel of stakeholders and other subject-matter experts (SMEs) from program offices and their suppliers used a structured, repeatable process to validate the FaC factors of each item under review. The working group then studied those items identified as fragile and critical in much greater detail, to

increase the value of employing the FaC information in future decision points. SMEs helped to confirm the session's results. The next step was to identify the DOD decision points, noting where the FaC information could be applied.

After completing all the FaC assessments, DOD takes appropriate actions to mitigate any IB issues, whether through the

suppliers themselves, program offices or PEOs, or OSD. The nature of the issue determines who leads the mitigation action. For example, the program office or the contractor will mitigate an IB concern that affects a single program. In contrast, OSD might address an IB concern that affects multiple programs and services. OSD leads the overall process so that it can manage the challenge of



### LEADING BY EXAMPLE

An M1A2 SEP Abrams tank from 1st Battalion, 30th Infantry Regiment "Battle Boars" fires Nov. 6, 2013, during a live-fire accuracy screening test at Red Cloud Range, Fort Stewart, GA. The M1 Abrams was the focus of the first program FaC assessment, conducted in FY12 as a pilot. The M1 assessment process became the model for the follow-on FY13 FaC assessments. (U.S. Army photo by SGT Richard Wrigley, 2nd Armored Brigade Combat Team, 3rd Infantry Division Public Affairs)



## THE FIRST PROGRAM FAC ASSESSMENT ... DEMONSTRATED THE IMPORTANCE OF WORKING WITH THE ... PROGRAM OFFICE AND OUTSIDE EXPERTS TO INCORPORATE THEIR PERSPECTIVES ON PARTICULAR TECHNOLOGIES AND INDUSTRY SEGMENTS.

mitigating problems that may cross multiple programs and services.

### RESULTS THAT COUNT

When the WIN-T Inc 1 assessment was complete, the results indicated that fragile and critical capabilities in the program were rare. This was largely because WIN-T is heavily and intentionally based on commercial technology. The WIN-T study made it clear that FaC capabilities cover more than just manufactured products; they also include personnel skill sets. Accordingly, the OSD working group is increasing the focus on skill sets in future assessments.

The entire WIN-T project office also learned valuable lessons from the effort. By understanding and identifying shortfalls in skill sets as a critical issue, PM WIN-T now takes proactive steps to identify these skills upfront for all of its current and future tactical communications network programs.

Although the assessment looked at WIN-T Inc 1, it produced information that is useful for other WIN-T increments and systems managed by the program office. Multiple Army and DOD organizations can also harness some of these lessons learned, which highlighted not only the importance of skill sets, but also other potential IB hazards to be addressed or prevented. Additionally, by taking part in the FaC assessment, the WIN-T team members honed their abilities to continually apply their own internal FaC analysis

for the design and fielding of new systems, as well as for current program sustainment, which is a system's most expensive life-cycle cost.

Because these were new efforts and the MIBP office was learning as it went along, the M1 and WIN-T assessments were very time-intensive. The office learned many lessons from WIN-T Inc 1 and the other nine assessments completed in FY13 and is applying that knowledge to perform future assessments more efficiently and cost-effectively.

One of those lessons came from a rigorous statistical analysis of assessment results, which revealed that the initial 15 FaC factors could actually be reduced to nine and produce better results. The office also learned that a greater focus on program or sector taxonomies could accelerate preparation of an assessment.

### CONCLUSION

Even though forces are returning from Afghanistan and the OPTEMPO is easing, the Army and joint forces must remain prepared for current requirements and to face future threats. By identifying specific stressors on the defense IB due to lower acquisition spending, the joint services can prepare for changes in investments and for both planned and unexpected fluctuations in OPTEMPO.

Identifying fragile and critical factors of the defense industrial base, especially in

today's fiscal environment, will allow the services to remedy these potentially detrimental issues cost-effectively or even prevent them, as current systems are sustained and new systems evolve.

For more information, go to <http://peoc3t.army.mil/c3t/> and <http://peoc3t.army.mil/wint/>; or contact the PEO C3T Public Affairs Office at 443-395-6489 or [usarmy.APG.peo-c3t.mbx.pao-peoc3t@mail.mil](mailto:usarmy.APG.peo-c3t.mbx.pao-peoc3t@mail.mil). For additional information for DOD employees, including the DOD encyclopedia entry on PM WIN-T, visit milWiki at <http://go.usa.gov/4Qvk> (government Common Access Card required).

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# Case *in* Point

Preserving the forward-looking infrared industrial base poses instructive challenges, opportunities

*by Mr. Michael V. Doney, Mr. William Salazar and Dr. Christina Bates*

**A**s the Army and the other U.S. military services withdraw from Afghanistan and budgetary constraints continue, the resulting drop in defense spending will have broad and deep effects on the defense industrial base (IB). That's the big picture. At the company and factory level, the IB will feel the ripple effects in many different and complex ways, all of which the Army and DOD are working diligently to understand and mitigate. The forward-looking infrared (FLIR) IB is a case study.

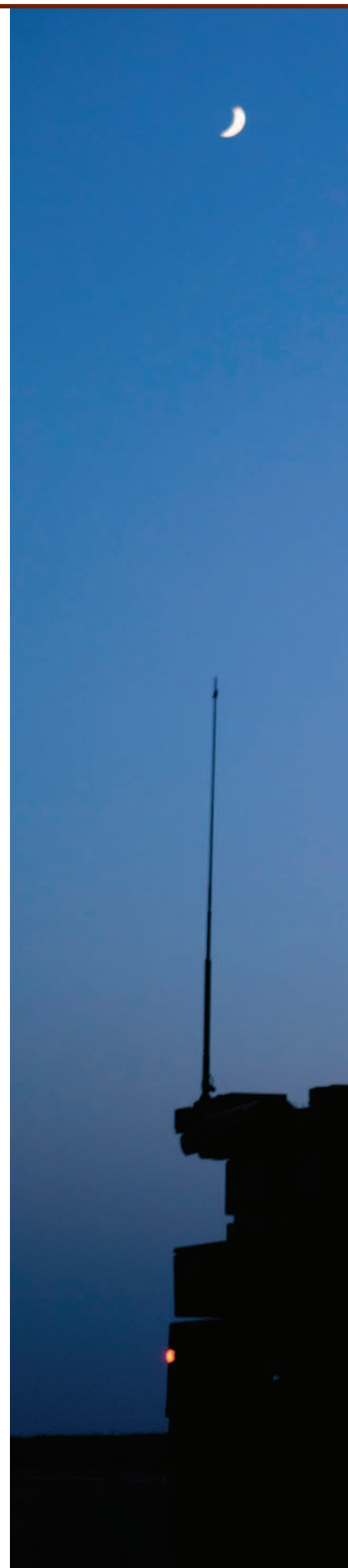
The first generation of FLIR technology (1GF) was developed for U.S. Army ground combat platforms in the mid-1970s to enable Soldiers to see in the dark and under obscured battlefield conditions. The introduction of this game-changing capability enabled the Army to "own the night" and established the FLIR IB, with which the Army has partnered continuously for more than 30 years.

After Operations Desert Storm and Desert Shield in the early 1990s, the Army

recognized its need for improved target acquisition capability to provide Soldiers with a uniform view of the battlespace and, in turn, reduce fratricide and improve probability of kill. In response, the Army established the second generation FLIR program (2GF) to develop and implement improvements over the existing 1GF.

The new technology would provide significant capability improvements, such as higher-resolution imagery to support long-range target identification, and increased sensitivity for more rapid target detection. The 2GF capability would be applied to numerous Army weapon systems, such as the Abrams Main Battle Tank, Bradley Fighting Vehicles, the Long Range Advanced Scout Surveillance System (LRAS3), the Improved Target Acquisition System, the Apache helicopter and the Javelin antitank weapon system.

Working together, the FLIR IB, the Product Manager (PdM) FLIR (now known as Product Manager Ground Sensors, or PdM GS), the Night Vision and Electronic







### OWNING THE NIGHT

The vast night sky over the Mine Resistant Ambush Protected vehicle at Camp Dwyer, Afghanistan, in this Aug. 11, 2013, photo is a reminder of the importance of the FLIR IB. (Photo by Cpl Paul Peterson, 2nd Marine Logistics Group)

Sensors Directorate (NVESD) of the U.S. Army Research, Development and Engineering Command's communications and electronics center, and the numerous Army ground platform product managers made significant improvements over the 1GF capabilities by using an acquisition methodology known as horizontal technology integration (HTI). HTI mandates the use of common hardware and supportability strategies across multiple platforms. Robust systems engineering processes are the cornerstone of the HTI approach.

By employing the same processes and technology across the myriad ground platforms, the HTI approach reduced the instances of "stovepiped" FLIR solutions for the varying ground platforms, thereby enabling the Army to achieve an identical and vastly improved battlespace view for Soldiers while gaining significant efficiencies and cost savings. These better buying power efficiencies continue today through the sustainment of common components for multiple platforms.

### COMPLEX AND MULTIFACETED

The FLIR IB was integral to the overall success of both the 1GF and 2GF programs. But to think of the FLIR IB as one homogenous entity is to underestimate how complex and heavily reliant it is on a very specific and narrow customer base—the U.S. military—for its continued viability. It is imperative to the Army, and to the United States, to sustain this unique industrial base to maintain the decisive overmatch that the Army enjoys today and must retain for the future.

The FLIR IB comprises numerous entities that produce various components for what ultimately becomes a 2GF. In simple terms, the FLIR IB can be divided into four tiers of organizations, categorized

according to the kinds of services or products they develop and provide for the overall 2GF product:

- Tier One entities include system integrators and sensor system-level suppliers. These are typically original equipment manufacturers (OEMs) with which the Army contracts for development or production of complete FLIR sensor systems.
- Tier Two includes suppliers of critical imaging subsystems, including FLIR optical assemblies such as the 2GF afocal telescope and imager-scanner; integrated Dewar cooler assemblies, also known as the 2GF standard advanced Dewar cooler assembly; and image processing algorithms, systems software, and electronics and control circuit card assemblies.
- Tier Three comprises suppliers of critical components of the 2GF subsystems, including the infrared focal plane arrays (FPAs), which convert the IR energy into electrons; the optical elements in the FLIR lenses; and the cryogenic coolers that maintain the FPAs at cryogenic temperatures.
- Tier Four entities manufacture critical materials and enabling technologies for the 2GF components, such as the multispectral IR coatings for lenses, the detector substrates used in FPA fabrication and the powerful magnets for the cryogenic coolers.

The success of the 2GF program hinged in large part upon the continued viability of each of these entities, as well as their ability to collaborate often and well with one another to produce a given 2GF. Today and in the foreseeable future affordable sustainment of fielded 2GF systems, as well as the requirement to modernize the 2GF sensor, will hinge upon the continued viability of the FLIR IB.



#### BATTLEFIELD EDGE

A cavalry scout from 6th Squadron, 4th Cavalry Regiment (6-4 CAV), Combined Task Force Duke moves along a ridge during an early morning reconnaissance patrol near Combat Outpost Khilaguy, Afghanistan, on Aug. 29, 2013. FLIR capabilities allow Soldiers to maintain a decisive overmatch that the Army is working to retain for the future. (U.S. Army photo by 1LT Charles Morgan, 6-4 CAV)

The multi-tier FLIR IB can also be broadly categorized into two segments, each of which is likely to require a different set of mitigations and solutions to the pressures on the IB.

One segment, the manufacturing base, consists not only of the OEM's physical plant and equipment but also key personnel with highly specialized knowledge and skills that are critical to the plant's successful operation. These skills are often the product of many years of experience. In order to sustain this segment of the FLIR IB, the Army will need to continue production orders that include lower-tier suppliers of critical subsystems, components and materials.

The other segment is the engineering and intellectual base, which is devoted to engineering, systems design, development, integration and testing of these highly complex sensor systems. It consists of personnel whose knowledge and experience in sensor systems are similarly

critical and highly specialized, such as skills in physics and all disciplines of engineering, including software, systems integration and testing. Likewise, the military will need to continue development efforts and extend them to lower-tier suppliers to stabilize and protect this segment of the FLIR IB.

#### A NARROW CUSTOMER BASE

Contributing to the FLIR IB's heavy dependence on the U.S. military for its continued viability is the fact that technology exports for the 2GF, and FLIR technologies in general, are highly controlled to ensure that the U.S. military retains combat overmatch. As a result, the FLIR IB's ability to capture revenue from foreign markets is limited.

At the same time, the U.S. military depends on the FLIR IB to develop and produce high-performance FLIR sensors with progressively improved performance over prior-generation products. Since the early 1980s, the Office of the





### HARNESSING 2GF

CSM Michael Grinston of the 4th Brigade Combat Team, 101st Airborne Division (Air Assault) looks through the LRAS3 system on Sept. 16, 2013, at Camp Wilderness, Afghanistan. Accompanying Grinston is SPC Joseph Flanagan of 1st Battalion, 506th Infantry Regiment. The LRAS3 is one of numerous systems that uses 2GF technology. (U.S. Army photo by SPC Charles M. Willingham, Combat Camera Afghanistan)

Secretary of Defense (OSD), the Army and the Defense Advanced Research Projects Agency have made significant science and technology (S&T) investments in research and development of IR FPA technology and in establishing flexible manufacturing capabilities for both cooled and uncooled FPAs. Sustainment of current-generation FLIRs and development of the next generation will be very difficult if these investments and support wane.

Another factor affecting the viability of the FLIR IB is the cycle time for technology and product development. FLIR cycle times are typically 10 to 15 years from initial investment through production. Historically, this investment has been concurrent with the production and fielding of the prior-generation technology, resulting in a continuous transition from one FLIR generation to the next. However, in support of the most recent war efforts, the Army made significant

investments in the 2GF for reset purposes, resulting in an acceleration and compression of the 2GF's production phase. As a result, there is an extended time gap between the 2GF and the Improved FLIR (IFLIR).

The continued viability of the FLIR IB is particularly essential in light of the Army's current pursuit of the IFLIR capability.

### SECURING THE NEXT GENERATION

PdM GS, Army ground platform program managers, the Army's S&T community and the FLIR IB are collaborating on the development of IFLIR, which will incorporate cutting-edge, high-definition thermal imaging technologies to provide the enhanced reconnaissance, surveillance and target-acquisition capabilities required to ensure technological overmatch for the current and future force.

To accomplish this, PdM GS and its platform partners are engaged in several strategic initiatives that are intended to address FLIR IB concerns while generating value for the Army by mitigating obsolescence and sustainment issues with the current 2GF technology.

For example, PdM GS, an element of Program Executive Office Intelligence, Electronic Warfare and Sensors (PEO IEW&S), has engaged with the FLIR IB and its platform partners, including PEO Ground Combat Systems, to generate a comprehensive view of the FLIR IB's current state and to identify and prioritize near- and long-term targeted investments and solution sets to support the FLIR IB. PdM GS and its platform partners will implement recommendations stemming from this business case analysis to mitigate the various FLIR IB risks.

In addition, PdM GS and NVESD have collaborated on a proposal to the OSD industrial base support program requesting support to protect the FLIR IB.

### CONCLUSION

Project and product managers should consider several factors when determining the level of maintenance required to ensure the viability of essential IBs, such as the FLIR IB. The factors discussed in this article must be balanced against several other influences, including the U.S. fiscal environment and Army requirements at a specified point in time.

When determining the optimal balance among these factors, the Army must assess the state of a given IB—including its composition, customer base and financial health—to ascertain how to incorporate its sustainment into an overall weapons program. The assessment should also include analysis to determine how best to generate near-term value for

the Army, where possible and practical, in efforts to maintain the industrial base. By achieving the optimal balance among these factors, we will keep the base warm, while simultaneously managing programs in a fiscally responsible and sustainable manner.

For more information, go to <http://peoiews.apg.army.mil>.

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### ILLUMINATING CAPABILITY

Cavalry scout SPC Joshua Otipoby engages targets using his night vision device Aug. 2, 2013, in Baghlan province, Afghanistan, during a range run by 6th Squadron, 4th Cavalry Regiment (6-4 CAV), 3rd Brigade Combat Team, 1st Infantry Division. Night vision is perhaps the best-known of the capabilities provided by the FLIR IB. (U.S. Army photo by 1LT Cory Titus, 6-4 CAV)



### TECHNOLOGY ADVANCES

SFC Charles Reynolds of 1st Battalion, 26th Infantry Regiment engages near targets on-the-move during nighttime short-range marksmanship training at Camp Voelke, Afghanistan, July 20, 2013. The Army is evaluating how best to preserve the FLIR IB as it continues to develop FLIR technology. (U.S. Army photo by 1LT Matthew Stephens, 3rd Brigade Combat Team, 1st Infantry Division)



# Assessing Industrial Base Risks

- **What is the potential** for joint development of technology road maps by the U.S. government and the given industry?
- **Is the technology included** on the list of militarily critical technologies?
- **Does the technology require** unique manufacturing technologies, processes and facilities?
- **Does the technology require** personnel with unique expertise developed over years of focused work in the field?
- **Does the expertise to produce** the technology reside only with a few or specific supplier(s)?
- **What is the state** of the current suppliers' businesses (i.e., financial health, viability, etc.)?
- **Are the suppliers' earnings** concentrated in a few programs?
- **Is the supplier highly dependent** on demand from the U.S. military?
- **What is the current and forecasted demand** across all relevant products and programs?
- **Is the supplier a sole source** for a given product? Does the supplier have an exclusive technical data package?
- **Is the supplier a foreign source** for a given product? Are there few or no U.S. suppliers capable of replacing the foreign source?

—PRODUCT MANAGER GROUND SENSORS

# NETWORK AFTER NEXT

NIE consistency and more competition will drive  
industry innovation

*by BG Daniel P. Hughes, COL Mark Elliott and COL John Zavarelli*

Just weeks after deploying to Afghanistan last summer, the commanders and Soldiers of the 4th Brigade Combat Team, 10th Mountain Division (4-10 MTN) christened the Army's new tactical communications network their "digital guardian angel." Capability Set (CS) 13 became critical to their daily operations in Afghanistan, enabling them to cover more ground safely and providing a considerable tactical advantage. Their experience shows why the Army pushed so hard over the past two years to deliver CS 13, our first integrated package of communication systems that supports mission command on-the-move and brings the Soldier into the network.

But we owe it to the 10th MTN—and the units next in line for new network technologies—to go further. How do we continue to enhance and refresh the network with each capability set? How do we make the network more capable but less complex to use, train, maintain and

sustain? How do we focus innovation on capabilities that could be transformative for the network of 2020 and beyond?

The answers rest in our partnership with industry. Examine Moore's Law—that the number of transistors incorporated in a chip will approximately double every 24 months—or simply look at your own cellphone: When the pace of progress is exponential, the Army cannot keep up by itself. To field the latest tactical communication technologies to Soldiers, we know we need industry's agility, innovation and investment, especially in a fiscally constrained environment. Our approach to driving industry involvement in the next phase of network modernization is built on two principles: consistency and competition.

## **A NEW CONSTRUCT**

Consistency is aimed at making the Network Integration Evaluation (NIE) a more productive venue for businesses of

all sizes to demonstrate their capabilities. While the Army is procuring commercial routers, antennas, network operations tools, operational energy solutions and other items as a result of the NIE process, it has taken several NIE cycles to refine the supporting processes for this new way of doing business. During that evolution, we have listened to feedback from our industry partners and are now implementing a new construct for NIE 15.1 and beyond.

This new construct will give industry additional time to respond to more focused capability gaps. It will also be synchronized with Army program objective memorandum (POM) planning so that successful systems can transition smoothly into our portfolios.

The other way we plan to engage the network industrial base is through more frequent competition. Government-owned waveforms and a standardized





#### CAPABILITY IN ACTION

SSG Shelby Johnson, a squad leader with the 4-10 MTN, observes the area around Forward Operating Base Torkham, Afghanistan. Johnson is wearing the new CS 13 communications suite, which was integrated and validated through the Army's NIE. (U.S. Army photo by SSG Jerry Saslav, 4-10 MTN Public Affairs)

Common Operating Environment (COE) set the conditions for the Army to conduct more competitions for radios, apps and other network components—putting the “buy fewer, more often” acquisition philosophy into action.

This approach will give more vendors the opportunity to participate in building the network and give the Army the flexibility to choose from multiple technologies. By structuring contracts to facilitate competition among qualified vendors on a regular basis, we will also reduce system costs and ensure that we encourage the innovation that will lead to progress with each capability set. For example, Company A could win a delivery order competition one year and Company B could win the following year, but both would have an incentive

to propose improved, affordable products for the year after that.

#### EVOLVING THE NIE

The Army remains committed to the NIE process, which has proven its value within the Army and industry since its launch in 2011. Driven by Soldier feedback, lessons learned in past NIEs have allowed the Army to mature certain programs, restructure or terminate others and reallocate resources to new priorities. CS 13 was integrated, refined and validated through the NIEs—reducing the integration burden on the 10th MTN and 101st Airborne Divisions while helping develop tactics, techniques and procedures (TTPs) for using the gear in the field.

Industry partners who submitted their systems for assessment not only have

received invaluable feedback from Soldiers and Army laboratories, but also have demonstrated the breadth of available commercial technology, informing the Army's acquisition strategy for several key programs. The Army has spent \$39 million to procure non-program of record, NIE-tested radios to field. Recently, Congress provided funding that gave the Army \$9.3 million to procure several systems under evaluation from previous NIEs. The Army also has begun to issue requests for proposals (RFPs) as a formal mechanism for streamlined competitive procurement of non-program of record systems that show promise at the NIE.

The first RFP process resulted in six contract awards to different vendors for their vehicle tactical routers to be evaluated at NIE 14.1 in fall 2013.

While there has been great success, we have also hit some speed bumps in ramping up the NIE process. Frustrated vendors told us that the government's capability gaps were too broadly defined, the funding was too scarce and the schedule too unpredictable. We understand industry's challenges, and we are adjusting the NIE to better facilitate vendor participation while meeting the needs of the Army within budget constraints.

### IDENTIFYING GAPS

Beginning with NIE 15.1 in fall 2014, the Army will add periodic network baseline assessments to pinpoint capability gaps that industry can zero in on for near-term network modernization. NIE 15.1 will assess the integrated network baseline to evaluate the performance of existing network capabilities and identify remaining gaps. This effort will be informed by the U.S. Army Training and Doctrine Command's Network Capability Review, an ongoing study that aims to identify the proper mix of systems and their requirements to provide integrated tactical network capabilities within various formations.

The capability gaps identified at NIE 15.1 will be fixed in place and released to industry so that their proposed solutions can be evaluated over the following two NIEs, 15.2 and 16.1. By identifying consistent gaps for two consecutive NIEs rather than releasing a new set with each exercise, the Army will increase industry's lead time in developing and submitting mature capability solutions. NIE 16.2 will include another network baseline assessment. Then the updated gaps will be fixed in place and released to industry for two more NIEs, and the pattern will repeat for subsequent cycles.

While the original NIE process was built to meet theater needs quickly, with



### COMPETITIVE BENEFITS

CPT Jonathan Page of the 4-10 MTN uses the Nett Warrior device connected to a Rifleman Radio at Nangalam Base, Afghanistan. The Army is conducting a full and open competition for the full-rate production phases of the Rifleman and Manpack radio programs. (U.S. Army photo by SFC E.L. Craig, 4-10 MTN Public Affairs)



### CS 13 TEST BED

LTC James DeOre watches the 4-10 MTN command team leave Nangalam Base. The unit was the first to deploy to Afghanistan with CS 13, which introduces mission command on-the-move and extends the network to the Soldier. (U.S. Army photo by SFC E.L. Craig, 4-10 MTN Public Affairs)





#### IN SEARCH OF A MID-TIER SOLUTION

Testers from the U.S. Army Electronic Proving Ground roll down a road near Fort Huachuca, AZ, on July 25, 2013, as they evaluate the MNVR system in a test involving more than 80 nodes throughout Fort Huachuca and the surrounding area. In September 2013, the Army awarded an initial contract for MNVR using a competitive non-developmental item acquisition approach designed to procure lower-cost, commercially available radios that meet the Army's requirement for a mid-tier tactical network solution. (U.S. Army photo by Douglas Smith, LRC Communications Security Logistics Activity)

the transition out of Afghanistan, the refined process will allow us to be more deliberate in determining and filling our network capability gaps. The new schedule and fewer, better-defined gaps will also allow the Army to better align NIE results with POM planning to inform procurement and fielding decisions for future capability sets.

With these positive changes, it is still important to reiterate that the value of the NIE goes beyond acquiring systems. As the Army transitions from fighting two wars to preparing for future threats, the NIE will provide the operational laboratory to incrementally enhance the network, respond to the emerging needs

of regionally aligned forces and assess dynamic “leap-ahead” capabilities—not just from industry, but also the Army science and technology community.

NIEs will continue to integrate capability sets before fielding, refine TTPs, evaluate force design options and non-materiel requirements such as training, and give Soldiers a “vote” by collecting their feedback on all of these areas. NIEs remain a vital component of the Army's modernization efforts.

#### COMPETITION FOR RADIOS

Since the advent of DOD's Better Buying Power initiative, there has been increased attention to the benefits of competition.

The rationale is clear: An environment in which multiple vendors compete to satisfy the same requirement can reduce cost, spur innovation, cultivate the industrial base and eliminate the single points of failure that come with dependence on one vendor. But to make a competition as effective as possible, the strategy must be tailored to the specific product and the current market. Fortunately, we are now hitting that “sweet spot” with a key part of the network—tactical radios.

The current marketplace is primed for the Army to competitively procure advanced networking radios. The technical maturity achieved in the commercial, software-programmable radio field over



## ADVANCING COMMUNICATIONS

PEO C3T is training “super” digital systems engineers on vehicles equipped with components of CS 13, the Army’s first integrated network fielding effort that spans the entire brigade combat team formation, connecting the fixed command post to the commander on-the-move to the dismounted Soldier. (Photo by Edric Thompson, U.S. Army Communications-Electronics Research, Development and Engineering Center)

the course of the Joint Tactical Radio System (JTRS) developmental effort has enabled industry to develop effective hardware solutions—radio “boxes”—more easily. Meanwhile, the Joint Tactical Networking Center (JTNC) maintains a data repository of secure networking

waveforms and applications that adhere to open standards set by the government. The repository, along with the JTNC laboratory and accreditation resources, are accessible to vendors, allowing the waveforms to run on multiple hardware models that industry produces. Through

our engagement with industry, including at the NIEs, we know that the technology now exists for a competitive marketplace of interoperable, affordable radios.

Thus, the foundation is in place to execute the Army’s tactical radio strategy.



In September 2013, we awarded an initial contract for Mid-Tier Networking Vehicular Radios (MNVR), using a competitive non-developmental item acquisition approach designed to procure lower-cost, commercially available radios that meet the Army's requirement for a mid-tier tactical network solution.

Now the Army is focused on executing full and open competitions, in which all industry partners can participate, for the full-rate production phases of the Handheld, Manpack, Small Form Fit Rifleman and Manpack radio programs. The goal is to decrease costs and drive down size, weight and power requirements while increasing system functionality and simplicity.

While the details are still being finalized, the Army will conduct a full and open competition for each radio, and award contracts to qualified vendors meeting the Rifleman and Manpack radio requirements. Qualified vendors then will compete for delivery orders as needed by the Army, after qualification and operational tests to confirm compliance with technical and operational requirements.

This constantly competitive environment promises to promote an active, engaged industrial base that has an incentive not only to lower prices but also to innovate for each capability set, ultimately improving the radios we deliver to Soldiers.

Such multilayered, multiple-vendor-competition has shown success before, such as with the Consolidated Interim Single Channel Handheld Radio (CIS-CHR) contract, executed under the JTRS program. Initiated in 2007, CIS-CHR provided a contract vehicle for the joint services to procure government off-the-shelf and non-developmental, software-defined tactical handheld radios.

While not a perfect comparison, CIS-CHR illustrates the potential advantages of a multiple-award contract that allows for delivery order competitions among vendors.

Although this type of strategy can require more effort to manage, the money saved through competition far exceeds the administrative costs. CISCHR yielded an average savings of more than 40 percent, compared with the contractual ceiling prices over the life of the contract. It is also noteworthy that the radio technologies and features improved as a result of the vendors' own investments.

Radios aren't the only network component for which the Army stands to benefit from increased competition. With the COE providing a comprehensive, standards-based open architecture, the Army can leverage industry's state-of-the-art capabilities and best practices for other computing environment technologies.

For example, many mission command systems previously developed by a single vendor as stovepiped boxes will be delivered instead as software applications, with multiple third parties competing to build and rapidly enhance them, broadening the market. The COE will also facilitate greater interoperability among various manufacturers' systems, creating possibilities for common interfaces and common training as we work to simplify the network for the end user.

## CONCLUSION

The network remains a critical Army modernization priority. It is a core element in enabling the Army to produce a future force that is smaller but still highly capable. As we build on lessons learned from the first CS 13 brigades to deliver these essential technologies to more units across the force, the Army will engage

industry through consistent NIEs and frequent competitions in order to improve and simplify network capabilities. Working as partners, we will continue to provide our Soldiers with the information they need to change the game.

For further information, go to <http://peoc3t.army.mil>.

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# Field Support Shifts to Reflect Integrated Network, More Agile Army

*by Mr. Richard Licata*

**I**n Afghanistan, the integrated Capability Set (CS) 13 tactical communications network is not only changing the way Soldiers operate on the battlefield, it is also fueling a realignment of command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) field support.

The Army has already adapted field support for CS 13 by training versatile support personnel who troubleshoot and maintain all network and mission command capabilities in the brigade combat team (BCT) formation. Now, Program Executive Office Command, Control and Communications – Tactical (PEO C3T) is looking to industry for new ways to train and educate the next generation of Soldiers as it restructures field support to meet dynamic requirements.

The Army wants to partner with industry as it moves away from system-specific roles for industry field service representatives (FSRs) to an approach that is more agile and unit-centric. In the move to simplify the tactical network for the end user, fewer FSRs will be required to train

Soldiers and troubleshoot systems. Rather than eliminating individual, system-specific experts across the board, the Army is working with industry to cross-train FSR personnel. They would serve as multifunctional specialists as we execute new integrated training initiatives and leverage regionally aligned reachback support.

This “invest in Soldiers” paradigm shift, which focuses not only on maintenance but also on a transfer of knowledge from field support personnel to Soldiers, will rely on support from the industrial base. With CS 13, we are giving Soldiers more information than ever. The increasing capability also brings complexity, and many systems are not as intuitive as they could be for users. We need industry to bridge the gap between system complexity and Soldier usability, keep the complexity inside the box and use industry’s expertise on systems to develop a more integrated training curriculum.

Led by PEO C3T, the U.S. Army Communications-Electronics Command (CECOM) and PEO Intelligence, Electronic Warfare and Sensors (PEO IEW&S), the new field support



## **BIG-PICTURE APPROACH**

A Soldier monitors maneuver engagements using CPOF, the primary common operating picture viewer used by the Army in all theaters. CPOF allows units to plot and share information on tactical operations in real time. With the realignment of FSRs, they will support not only CPOF, but all capabilities that PM MC fields to a BCT. (U.S. Army photo)



**IN THE KNOW**

SPC Daniel Sanders, an infantryman with 2nd Brigade, 1st Armored Division, troubleshoots Intelligent Power Technology generators during NIE 14.1 at Fort Bliss, TX, Oct. 28, 2013. PEO C3T, CECOM and PEO IEW&S are spearheading a new, more unit-centric, less system-specific role for FSRs who train Soldiers, with the goal of enhancing Soldiers' understanding of systems. (Photo by SSG George Gutierrez, 212th Fires Brigade, 24th Press Camp Headquarters)

paradigm uses a four-tiered approach to maintaining equipment readiness. (See “Back to Basics,” Army AL&T magazine, July-September 2013, Page 22.) In this approach, Soldiers are the first level of support for operating and maintaining C4ISR equipment. Logistics assistance representatives (LARs), digital systems engineers (DSEs) and select FSRs serve on Tier 1 as the second level of support. When resolution is unattainable at Tier 1, the appropriate system-specific subject-matter experts at Tier 2 will attempt to resolve the issue telephonically or remotely, if necessary passing the problem up to Tier 3 engineers to determine a hardware or software modification.

LARs, DSEs and select FSRs will support all C4ISR weapon and communications systems in the field, with each member aligned to specific systems. For example, although PEO C3T's Project Manager Mission Command (PM MC) fields

both the Command Post of the Future (CPOF) and Advanced Field Artillery Tactical Data Systems (AFATDS), currently system-specific FSRs are dedicated to maintaining each system. Under the realignment, FSRs will be unit-centric, thus supporting not only CPOF and AFATDS, but all capabilities that PM MC fields to a BCT.

The tiered structure has been Soldier-tested with pilot and validation exercises at the Joint Readiness Training Center (JRTC), Fort Polk, LA, and the National Training Center (NTC), Fort Irwin, CA, during FY13 rotations. The exercises determined that 78 percent of all trouble tickets were training-related and could be resolved at a lower echelon, had training been performed at home station before the rotations.

In support of the changing field support construct, the Army has also introduced the Unified Trouble Ticketing System

(UTTS) to provide a virtual reporting mechanism that connects Soldiers with LARs, DSEs and FSRs. The UTTS streamlines the trouble ticket request process and can be accessed through the unit's SharePoint application to report incidents quickly.

The realignment, which is scheduled to be implemented for all future JRTC and NTC rotations, is expected to yield more than \$70 million in cost avoidance for the Army during FY14-20.

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# NEW NAME, NEW EFFICIENCIES

Directorates of logistics become logistics readiness centers for more effective access to services and supply

*by COL Dan J. Reilly*

**W**hen the U.S. Army Materiel Command (AMC) rebranded the installation directorates of logistics (DOLs) as logistics readiness centers (LRCs) on Oct. 1, 2013, the rebranding not only culminated the formal transfer of 73 DOLs worldwide from the U.S. Army Installation Management Command to AMC, but also established a vision to integrate and optimize AMC capabilities on installations.

This transformation enables AMC to focus on materiel and services support, allowing installation commanders to focus on managing their installations. It also optimizes the LRCs' capability and capacity, improves contract management, and enhances quality and visibility of services. The LRCs provide the command additional field maintenance expertise, transportation services and base logistics support. This aids the U.S. Army Sustainment Command (ASC) in its mission to support the Army Force Generation process.

The LRCs are designed to provide an AMC presence on every installation. Today, the LRCs manage installation supply, maintenance and transportation. This includes food service, ammunition supply, clothing

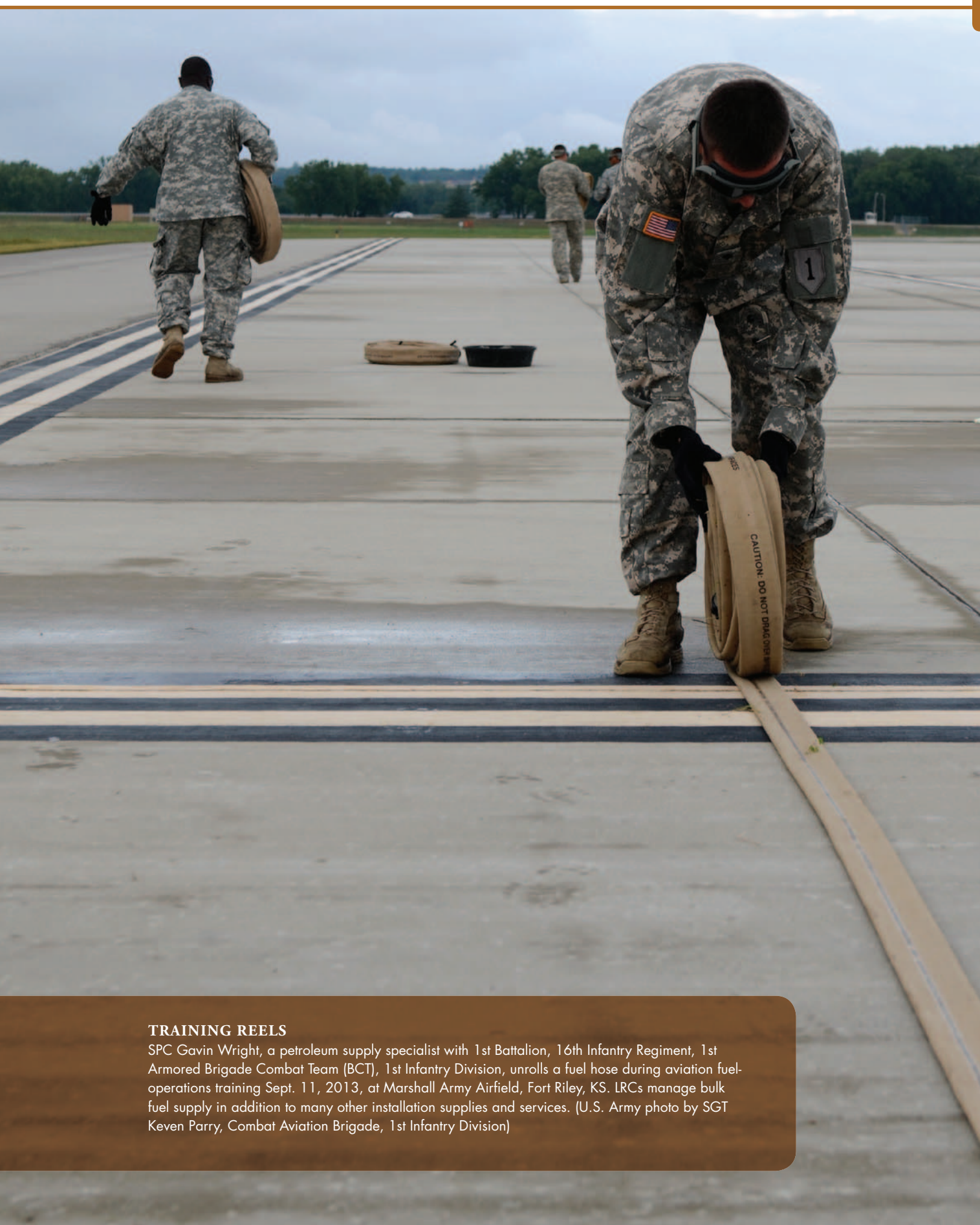
issue facility and initial issue point, hazardous material, bulk fuel, personal property and household goods, passenger travel, nontactical vehicles, rail and garrison equipment maintenance.

As a result of the transfer of installation DOLs to AMC a year earlier on Oct. 1, 2012, the DOLs became separate activities on their installations. This uniquely identified each DOL as an Army operational unit. The change in the DOLs' status on the installations required an official name change on authorization documents. It also marked a change in their mission as AMC's "face to the field," which necessitated realignment with DA and the renaming from DOL to LRC.

ASC, as AMC's operational arm, assumed responsibility for the LRCs during the 2012 transfer. ASC's mission is to sustain Army and joint forces throughout the world in support of combatant commanders, so this additional mission fit perfectly with its capabilities.

Upon transfer, AMC did not implement the name change because the focus was on a seamless transition. One year later, AMC believed the timing was right to formally rebrand the DOLs as LRCs.





### TRAINING REELS

SPC Gavin Wright, a petroleum supply specialist with 1st Battalion, 16th Infantry Regiment, 1st Armored Brigade Combat Team (BCT), 1st Infantry Division, unrolls a fuel hose during aviation fuel-operations training Sept. 11, 2013, at Marshall Army Airfield, Fort Riley, KS. LRCs manage bulk fuel supply in addition to many other installation supplies and services. (U.S. Army photo by SGT Keven Parry, Combat Aviation Brigade, 1st Infantry Division)



#### MEETING THE DEMAND FOR SUPPLY

Soldiers with 703rd Brigade Support Battalion (BSB), 4th Infantry BCT, 3rd Infantry Division (4-1 ID), sling-load a container to a CH-47 Chinook helicopter, Oct. 15, 2013, on Forward Operating Base Shank, Afghanistan. (U.S. Army photo by SGT Sarah Bailey, 703rd BSB Public Affairs)

#### LONG-TERM VISION

This transition results in a single entry point to access AMC capabilities. It best postures AMC to support the vision outlined in Globally Responsive Sustainment 2020, Army 2020 and Defense Support to Civil Authorities, setting conditions to optimize AMC capabilities from power projection platforms to forward operating bases.

Globally Responsive Sustainment 2020 is an approach that seeks to produce a sustainment system that is optimized, integrated, synchronized, affordable and relevant to support unified land operations

and the joint warfighter while minimizing redundancy.

Army 2020 is an initiative to transition the Army to address future security challenges. The sustainment initiative develops and implements the Army 2020 Sustainment Strategy through its ongoing efforts in the area of tactical sustainment force structure.

#### ONE LOGISTICAL HUB

The LRCs are AMC's single face-to-the-field on installations, through which customers can access, integrate and synchronize AMC capabilities to support

senior commanders, installation tenants and units' priorities. Each LRC acts as the single hub on an installation for customers to access the Army sustainment base, giving Soldiers, commanders and joint partners on Army installations the full power of a globally networked logistics command with responsibility for Soldier services, supply and maintenance support.

Installation-based LRCs, forward-deployed Army field support brigades, ASC and AMC together control the supply chain "from factory to foxhole," including forward operating bases.





#### MEALS, READY TO ROLL

Soldiers deliver Meals, Ready to Eat, water, fuel and other supplies to the 3rd BCT, 82nd Airborne Division during an exercise at the Joint Readiness Training Center on Fort Polk, LA, Aug. 23, 2013. (U.S. Army photo by SGT Amanda Tucker, 82nd Sustainment Brigade Public Affairs)

**THE LRCs PROVIDE THE COMMAND ADDITIONAL FIELD MAINTENANCE EXPERTISE, TRANSPORTATION SERVICES AND BASE LOGISTICS SUPPORT. THIS AIDS THE ASC IN ITS MISSION TO SUPPORT THE ARMY FORCE GENERATION PROCESS.**

LRCs enable AMC to bring its full capabilities to the decisive point on an installation in support of Army power projection platforms, training requirements and no-notice contingency missions, as the Army transitions to a globally deployable force based in the continental United States.

#### EAGLE CONTRACT STRATEGY

In the future, the transition to LRCs will result in efficiencies and increased effectiveness. Before the transition, each installation managed its own contracts. Currently, the Army has more than 250 contracts for the acquisition of LRC

installation logistics services. That has resulted in redundant capabilities and excess capacity. In response, ASC developed a contracting strategy called the Enhanced Army Global Logistics Enterprise program (EAGLE), to address inconsistencies in requirements and levels of service.

The EAGLE program focuses on material maintenance services, retail and wholesale supply services, and transportation support services. It also executes logistics services and requirements using an innovative strategy designed for flexibility. The EAGLE program fundamentally changes



## FIREFIGHT

Members of the U.S. Army Reserve and Air National Guard (ANG) practice extinguishing a fire during Exercise Patriot 13 at Volk Field, WI, July 17, 2013. The Patriot exercise is a domestic operations scenario to assess the ANG's ability to assist state and local agencies in response to multiple emergencies. The transition to LRCs postures AMC to support the vision of Defense Support to Civil Authorities, among other doctrine. (U.S. Army photo by CPT Dan Marchik, 103rd Sustainment Command (Expeditionary))

the way that the Army acquires installation logistics services, by increasing competition and small business participation, reducing the number of contracts to award and oversee, and reducing the acquisition timeline by using task order competitions under multiple basic ordering agreements.

In addition, EAGLE task orders can expand or contract based on funding and requirements—that is, the Army pays only for the services it needs and receives. Currently, 128 contractors, 78 of which

are small businesses, are qualified to compete for EAGLE task orders.

EAGLE can be scaled and adapted as needed, which makes it ideal for the current fiscal environment as well as the overall defense resource strategy. EAGLE contracting strategies align with those of DA and DOD.

Five EAGLE task orders were awarded in the fourth quarter of FY13. Through contracting strategies such as EAGLE, AMC is expecting at least a 15 to 30

percent savings on contracts. Those five EAGLE task order awards in Q4 of FY13 reflect an 18 percent reduction from previous contracts.

## CONCLUSION

As the LRC concept matures, it will continue to set the conditions to integrate all AMC capabilities under one roof. Through consolidation of AMC mission command, ASC will increase flexibility, eliminate redundancy, standardize processes, ensure reachback through our life-cycle management commands





#### SIGN HERE

SFC Joseph Russell, an infantryman with 1st Battalion, 6th Infantry Regiment, signs a hand-receipt to get an AT-4 anti-tank weapon from unit supply specialist SGT Derrick Taylor April 15, 2013, in the unit supply room at Fort Bliss, TX. (U.S. Army photo by SGT Larry Barnhill, 24th Press Camp Headquarters)

**INSTALLATION-BASED  
LRCs, FORWARD-DEPLOYED  
ARMY FIELD SUPPORT  
BRIGADES, ASC AND AMC  
TOGETHER CONTROL THE  
SUPPLY CHAIN "FROM  
FACTORY TO FOXHOLE."**

and other AMC major subordinate commands, and meet the challenges of a constrained fiscal environment, all while continuing to sustain the Army and joint forces worldwide in support of combatant commanders.

*For more information, contact ASC's executive director for field support at 309-782-4815 or [usarmy.ria.asc.list.fs@mail.mil](mailto:usarmy.ria.asc.list.fs@mail.mil).*

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# PBUSE PLUS

CECOM Web-based logistics server solution creates property book system efficiency



*by Mrs. Lonna K. Freeland, Mr. Paul D. Bedard and Mr. John E. Laudan*

This past summer, the U.S. Army Communications-Electronics Command (CECOM) Software Engineering Center at Fort Lee, VA, (SEC-Lee) unveiled an enterprise architecture upgrade for the Property Book Unit Supply Enhanced (PBUSE) system. At its heart is the Oracle SPARC SuperCluster platform, which provides increased performance, scalability and flexibility, while enhancing system security.

Introduced in 2001, PBUSE is the Army's first Web-based enterprise system of record for property accountability. It supports a community of users—commanders, property book accountability officers, unit supply managers and logistics staff officers—with immediate access to the PBUSE shared database and processes anywhere, whether in Afghanistan, at Fort Hood, TX, or in the Pentagon, and on any platform over a secure communications channel.

SEC-Lee replaced all the existing, antiquated hardware with the upgrade,

making CECOM the first agency in DOD to capitalize on this optimized platform. When PBUSE experienced severe server problems in accommodating an increasing mission workload, Ricky Daniels, director, SEC-Lee Tactical Logistics Directorate (TLD), made the decision to acquire the SuperCluster to completely replace the PBUSE server architecture. The SuperCluster represents a major improvement in server performance that not only sustains current and future PBUSE operations, but also provides ample capacity and capability to support the broader range of SEC-Lee TLD's initiatives.

Speed and efficiency of the system are vital to Soldiers in the field. Given the Army's future operating environment, in which reliable information must be shared in real time across multiple systems to enable informed decision-making, the Army must look for supply chain efficiencies, such as PBUSE, to enhance the execution of global distribution responsibilities.

## A CRITICAL LINK

PBUSE has 13 system interface partners, including the Logistics Support Agency (LOGSA), the Army's logistics data warehouse. LOGSA and PBUSE interface 24/7 to ensure the accuracy and timeliness of their respective databases.

Another key interface is the General Fund Enterprise Business System (GFEBS). PBUSE has been identified as an Army program system of record by the assistant secretary of the Army for financial management and comptroller for financial auditability of military equipment and general equipment. PBUSE provides information for the GFEBS financial accountability record to ensure synchronization with the PBUSE property accountability record. Implementation of the PBUSE SuperCluster architecture has enhanced interoperability with its interface partners.

PBUSE is a deployable, tactical logistics system that is a critical link to delivering the equipment Soldiers need on the ground, which is essential to mission





#### SUPERCLUSTER LAUNCH

The ribbon-cutting for the PBUSE SPARC SuperCluster took place on July 16, 2013. From left are Lonna Freeland, system manager for the PBUSE program; John Laudan, project officer and contracting officer's representative for PBUSE; Maxine Bond, McLane Advanced Technologies program manager; Paul Bedard, assistant system manager for PBUSE; and Tony Meyer, SAIC deputy program manager. (Photo by Mike Dunbar, SEC-Lee)

success. Optimizing the global supply chain with PBUSE upgrades like this one is key to enabling Soldiers to see their data in real time. They can track status, location and other key information and thus manage materiel distribution with unprecedented accuracy, speed, awareness and efficiency. Through the application of Item Unique Identification, PBUSE enables the Army to meet its responsibility to Congress to track new equipment fielding from the program manager to the gaining unit.

To date, the system supports approximately 40,478 active Army, Reserve and National Guard users, averaging 34,750 transactions daily for on-hand assets valued at more than \$212 billion.

The improved computing environment realized from this cutting-edge

technology is expected to enhance efficiency and performance by combining the computer power of the T4-4 servers, the scalability of the Oracle Solaris 11 server operating system, the database optimization of Oracle Exadata and the unified systems management of Oracle Manager Operations Center.

The T4-4 compute nodes allow PBUSE to meet the Army's goals for consolidation and virtualization. Empowered with the latest Oracle hardware and cloud operating system, PBUSE has gone virtual. The T4-4 provides a high-performance computing platform that supports both single and multithreaded applications. The T4 processor has built-in virtualization hypervisor and crypto engines, a capability that provides for zero-overhead virtualization and encryption without affecting system performance and input/

output (I/O) overhead. User requests travel within the cloud operating system as much as 32 times faster than with the legacy PBUSE system it replaced. The SuperCluster technical architecture also features a much more robust and in-depth layered security environment to protect vital information.

This is one example of how CECOM continues to bridge the "state of the art" with the "art of the possible" by applying information technology upgrades to increase efficiency and effectiveness of property book management.

#### OUT WITH THE OLD

The PBUSE SPARC SuperCluster hardware architecture replaces approximately 30 obsolete servers, allowing for vertical and horizontal scalability to provide environments for software development,



### WORKING THE SYSTEM

Personnel at SEC-Lee try to “break the system” during government acceptance interoperability testing for Interim Change Package 7.0.2 in September 2013. Eighteen testers participated, providing feedback and concurrence on the upcoming software release. The enterprise architecture upgrade provides increased performance, scalability and flexibility, while enhancing system security. (Photo by Mike Dunbar, SEC-Lee)

testing, sustainability, training and customer support operations—all from a single computing environment. Thus, the SuperCluster provides greater flexibility and support growth to the system administrator where needed; it can expand compute nodes, database storage or general-purpose storage independently of the other capabilities.

This hardware upgrade has significantly improved the responsiveness and availability of the PBUSE application, providing faster results and allowing the Soldier in the field to perform mission-critical tasks. Within the first 12 hours of the hardware cut-over, server activity increased dramatically, using only 2 percent of the Web and application server capacity with more than 16,000 users logged into PBUSE; some 18 million database actions and 45,000-plus transactions were posted to the activity register.



### HARNESSING PBUSE

SFC Eileen Espelien of the Training Support Unit at the Minnesota National Guard’s Camp Ripley Training Center performs a sub-hand receipt inventory using PBUSE. The decision to acquire the Oracle SuperCluster to replace the PBUSE server architecture was a response to severe server problems in accommodating an increasing PBUSE mission workload. (Photo by SFC Vincent Wiskus, Minnesota National Guard Sustainment Automation Support Management Office)

The multipurpose engineering system has pre-integrated servers comprising T4 processors running Solaris 11; Exadata Storage Servers for increased database performance; low-latency, high-speed InfiniBand I/O fabric connecting all components; cloud management applications; journaling file systems that are self-healing; and an external ZFS storage array that provides both high performance and the ability to preserve and manage large volumes of file-based data. The Database Exadata storage is approximately 100 terabytes (TB), and the ZFS file system storage is approximately 55 TB.

SPARC SuperCluster virtualization allows the Army to subdivide the supported platform’s resources, such as the computer processing unit, memory, network and storage, by creating multiple independent partitions called “logical virtual domains,” divided between applications





and the database. This modernizes and consolidates the PBUSE enterprise infrastructure and decreases the physical footprint from six server racks to 1 ½ racks at the production site, realizing a 30 percent reduction in demand for power and cooling.

## CONCLUSION

The SuperCluster has enabled increased flexibility in provisioning and deployment of a higher level of PBUSE services, providing a more uniform management interface with increased response rates and less time in executing tasks. This is an essential quality as the Army continues to evolve in how it fights and wins wars, through enhanced Soldier capabilities made possible by advanced technology.

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## QUIET POWER

The PBUSE SPARC SuperCluster takes up one-third of the space of the previous six racks, uses a fraction of the power and vastly improves speed and efficiency. (Photo by Mike Dunbar, SEC-Lee)

# IT STARTS **HERE**

Army educational outreach to build science, technology, engineering and math talent helps grow the workforce of tomorrow

*by Mr. Jeffrey D. Singleton and Ms. Andrea Simmons-Worthen*

**T**he Army employs more than 800,000 military and civilian personnel, 96,000 of whom occupy science, technology, engineering or mathematic (STEM) positions, according to Defense Manpower Data Center classifications. Of that 96,000, more than 16,000 are world-class scientists and engineers within the Army's 16 laboratories and research centers. These scientists and engineers develop leading-edge technologies and advanced capabilities that give our Soldiers, the Army's greatest asset, the decisive advantage in the face of our adversaries and keep them safe from harm.

Broadly defined to include jobs such as technicians that don't require a bachelor's degree, science and technology (S&T) occupations make up 21 percent of the nation's workforce, and that percentage is increasing steadily, according to Georgetown University's Center on Education and the Workforce. The Army and the nation have a growing need for highly qualified, STEM-literate technicians and skilled workers in advanced manufacturing, logistics, management and other technology-driven fields.

But the need for STEM literacy—the ability to understand and apply concepts from science, technology, engineering and mathematics in order to solve complex problems—goes well beyond the traditional STEM occupations of scientist, engineer and mathematician. The U.S. Department of Labor predicts that in the next decade, 80 percent of jobs will require STEM skills, yet only 16 percent of college students pursuing bachelor's degrees will be specializing in STEM fields.

Emerging mission requirements further complicate the challenges for the DOD STEM workforce. Multidimensional and

cross-disciplinary STEM competencies are essential to supply technical talent in our research centers for emerging fields as well as to provide STEM-literate talent for the research and analysis work that the Army does continually across every field. In other words, the Army must prepare human capital for jobs that don't yet exist, using technologies that haven't yet been invented. The success and sustainment of this STEM infrastructure depends on the STEM-literate community to support innovation, further adding to the demand for STEM talent and accentuating the STEM challenge.

## **NURTURING TALENT**

The growing demand for STEM competencies, the global competitiveness for STEM talent and the unbalanced makeup of STEM fields have led to President Obama's call for an all-hands-on-deck approach to the STEM challenge. Developing a highly competent STEM workforce requires partnerships among government, industry and academia. The Army makes a unique and valuable contribution to the national STEM challenge by providing access to its world-class technical professionals and research centers for students and teachers.

The Army Educational Outreach Program (AEOP) manifests the Army's STEM education strategy to ensure enduring access to highly qualified U.S. talent. AEOP provides a coordinated portfolio of STEM programs across S&T commands as well as government, university and industry partners. It offers students and teachers a collaborative, cohesive array of programs that effectively engage, inspire and attract the next generation of STEM talent from kindergarten through college, thereby exposing students to STEM careers in DOD.





### CELEBRATING KNOWLEDGE

Student participants in the AEOP programs Gains in the Education of Mathematics and Science (GEMS), Science and Engineering Apprentice Program (SEAP) and College Qualified Leaders (CQL) enjoy a closing ceremony in September 2103 at Georgetown University in Washington, DC. Co-sponsoring the event were the Walter Reed Army Institute of Research and 100 Black Men of Greater Washington, DC. (Photo courtesy of 100 Black Men of Greater Washington, DC)

Using the Army S&T workforce as mentors (either directly or through a near-peer mentor model), as well as our laboratories and research assets, the Army strives to build a diverse, well-prepared, STEM-literate talent pool to supply current and emerging workforce needs. This strategy, directed by HQDA, allows the Army to capture measures of success, identify program gaps,

leverage resources and defend a sustainable STEM infrastructure.

### A STUDENT'S STORY

A young scientist's experience illustrates the powerful potential of AEOP.

Saumil Bandyopadhyay, a freshman at MIT, didn't wait until graduation from Maggie L. Walker Governor's School

in Richmond, VA, to begin developing novel technologies for use by cutting-edge organizations.

Bandyopadhyay became interested in optical processes in semiconductors at a young age, after reading about photodetectors and their use in lifesaving applications such as car-collision-avoidance systems, mine detection, night

vision and missile defense. After learning about the challenges of making infrared photodetectors, he set out to solve one of the problems: to create a photodetector that could work at room temperature. He immersed himself in research over two summers. Bandyopadhyay's dedication to the problem, several days a week, resulted in four peer-reviewed journal publications (he is lead author of two) and a provisional U.S. patent for his discovery of a novel photodetector.

His research—under the mentorship of Dr. Gary C. Tepper, chair of the Department of Mechanical and Nuclear Engineering at Virginia Commonwealth University, where Bandyopadhyay's father, Supriyo, is Commonwealth Professor of Electrical and Computer Engineering—led to a new capability: a universal photon and particle detector built with semiconductor nanowires that can operate at room temperature and detect the entire electromagnetic spectrum. Its infrared detectivity is at least 10 times higher than that of other state-of-the-art equipment.

Bandyopadhyay focused on making his detector ultrasensitive, rugged, reliable, inexpensive and mass-producible. Potential applications include detection of buried mines, monitoring of global warming, radiation therapy and homeland security.

In all, Bandyopadhyay spent an estimated 1,600 hours on the project, all before his senior year. He immersed himself in research starting in seventh grade, including several years at the U.S. Army Engineering Research and Development Center in Alexandria, VA, through an AEOP high school internship initiative, the Science and Engineering Apprenticeship Program. He plans to major in electrical engineering and enter a career



#### HARD SCIENCE

Saamil Bandyopadhyay fabricates photodetectors in the Wright Virginia Microelectronics Center clean room at Virginia Commonwealth University during his high school years. Before he reached his senior year in high school, Bandyopadhyay spent an estimated 1,600 hours creating a photodetector that could work at room temperature. (Photo courtesy of Supriyo Bandyopadhyay)



#### SHARED EXPLORATION

A student explores other student research at the September 2103 closing ceremony for participants in the AEOP programs GEMS, SEAP and CQL, at Georgetown University in Washington, DC. (Photo courtesy of 100 Black Men of Greater Washington, DC)





### ON A MISSION

Students in the eCYBERMISSION program receive a warm welcome at the White House Science Fair from Dr. Patricia Falcone, associate director for national security and international affairs in the White House Office of Science and Technology Policy. The annual eCYBERMISSION competition, part of the AEOP, is a free online program to cultivate student interest in STEM by encouraging students in grades six through nine to develop solutions to real-world challenges in their areas. (Photo courtesy of DASA(R&T))

as a scientific researcher. By supporting Bandyopadhyay with the mentorship and facilities to expand his knowledge and allow him to explore solutions, we have capabilities today that we did not have just a couple of years ago.

### CONCLUSION

While every student who takes advantage of AEOP's programs isn't necessarily a Saumil Bandyopadhyay doing cutting-edge research in middle school, exposure to the STEM field and STEM professionals is critical to growing the next generation of STEM-literate young men and women who will form the Army's workforce of tomorrow.

Looking at the STEM challenge, John W. Gardner, former U.S. secretary of health, education and welfare, captured it best: "We don't even know what skills may be needed in the years ahead. That is

why we must train our young people in the fundamental fields of knowledge, and equip them to understand and cope with change. That is why we must give them the critical qualities of mind and durable qualities of character that will serve them in circumstances we cannot now even predict."

For more information on the AEOP, go to [www.usaeop.com](http://www.usaeop.com). For more information on the STEM challenge, see the Georgetown University Center on Education and the Workforce report "STEM" at <http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/stem-complete.pdf>; and "An Interim Report on Assuring DoD a Strong Science, Technology, Engineering, and Mathematics (STEM) Workforce," by the National Academy of Engineering and the National Research Council, at [http://www.nap.edu/catalog.php?record\\_id=13433](http://www.nap.edu/catalog.php?record_id=13433).



### HEALTHY EXPOSURE

Students participate in the 2011 GEMS program at the Walter Reed Army Institute of Research, Silver Spring, MD. GEMS is geared to students in middle and high school, exposing them to engineering, robotics, biology, chemistry and geology. (Photo courtesy of DASA(R&T))

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# INVESTING *in the* FUTURE

ERDC reaches out to the next generation of STEM professionals through multiple avenues

*by Dr. Peggy Brasfeild Wright*

Statistics tell the tale. According to the Organization for Economic Cooperation and Development, the United States ranks 23rd worldwide in standardized science, technology, engineering and mathematics (STEM) testing. U.S. Bureau of Labor statistics predict that, in the next decade, 80 percent of U.S. jobs will require a STEM background, yet only 16 percent of college students pursuing bachelor's degrees will be specializing in STEM fields.

The U.S. Army Engineer Research and Development Center (ERDC) has a long tradition of STEM outreach because science, engineering and technology are the foundation of its mission. When statistics indicated that ERDC needed to hire more than 500 additional scientists and engineers through 2020 to solve the technical challenges of the future, the organization stepped up its STEM outreach activities.

In 2010, ERDC established a Human Capital Office, with STEM outreach playing a critical role toward ensuring a readily available pool of talent to meet future needs. Building on the past successes of intern and student programs, ERDC expanded its reach and developed a vibrant K-12 program to engage, inspire and mentor students.

"ERDC's mission is to provide innovative solutions for a safer, better world. We currently use more than a dozen DOD, Army and ERDC programs to attract the best and brightest students, and we employ more than 300 college undergraduates and graduates annually across the ERDC," said Dr. Jeffery Holland, ERDC director and the driving force behind establishing the Human Capital Office.

"These programs allow us to engage, inspire, mentor and recruit the future generation of scientists and engineers, who will carry on vital research. The reason







#### WORKING IN CONCERT

Cadet Matthew Shoenberger works with concertina wire alongside ERDC intern Gray Cordes, a senior at Warren Central High School in Vicksburg, MS. (Photo by Micael Edwards, ERDC)





## EARLY RECRUITING

LTG Thomas P. Bostick, USACE commanding general, visits the robotics session of a recent GEMS summer camp to discuss the importance of STEM careers with the students. (Photo by David Roberts, ERDC)

ERDC exists is to provide answers to the toughest problems facing the Army and the nation—from keeping our Soldiers safe to protecting our nation’s infrastructure and the environment. The mission won’t decline. The Army will always need problem solvers. We’re committed to making that happen.”

Summer camps, robotics teams, classroom interaction, intern and adjunct-professor programs, and educational partnership agreements all contribute to ERDC’s, and therefore the Army’s, success over the past three years.

## MAKING CONNECTIONS

ERDC draws on the Army Educational Outreach Program (AEOP) for many of

its most successful efforts. The AEOP comprises Army-sponsored research, education, competitions, internships and practical experiences to engage and guide students and teachers in STEM education. Examples include these AEOP-funded initiatives:

- Camp Invention, a summer camp that targets underserved children in Title I schools. It enhances the ability of children in kindergarten through sixth grade to learn through teamwork and subject immersion while cultivating a sense of discovery. ERDC sponsored three camps in FY12, reaching 374 students.
- The Gains in the Education of Math and Science (GEMS) summer camp

aims to engage and inspire students in middle and high school by exposing them to engineering, robotics, biology, chemistry and geology and encouraging them to explore careers in these fields. ERDC has sponsored up to 120 students each year in GEMS for the past seven years.

- eCYBERMISSION allows student teams in grades six through nine to compete while solving real-world problems using science and mathematics. ERDC scientists volunteer to mentor teams and provide technical feedback.

In addition to using the AEOP’s many initiatives, ERDC has a number of avenues for fostering and recruiting STEM talent. These include:



- STEM Bowl, developed and implemented through a partnership of ERDC, Jackson State University (JSU) and Lockheed Martin Corp. STEM Bowl engages multiple high schools, with more than 40 students competing annually; awards scholarships to students; and provides incentives to teachers. ERDC provides the technical expertise, JSU hosts the event and Lockheed Martin provides the funding.
- Involvement in For Inspiration and Recognition of Science and Technology (FIRST) Robotics. From 2000 to 2013, ERDC volunteers mentored more than 30 students annually, and ERDC has benefited by hiring more than 20 employees from the robotics teams.
- Employment of more than 300 students annually through STEM programs. Eighty-five ERDC scientists and engineers are adjunct professors at 54 colleges and universities, and ERDC has 51 educational partnership agreements with colleges and universities, including 10 with historically black colleges and universities or minority institutions, and 13 with K-12 schools.
- Hiring of 171 science and engineering graduates, each with overall GPAs of 3.6 or greater, in the past three years using Direct Hire Authority and Distinguished Scholar Academic Achievement Authority. Not only does ERDC recruit the best, it also retains the highest-quality experts in the disciplines needed to develop technologies for the Army and the nation. ERDC's science and engineering staff of 1,061 comprises 335 doctoral, 464 master's, and 262 bachelor's degree holders in virtually every science and engineering discipline.

### TEACHING THE TEACHERS

ERDC also believes that providing training and resources to teachers contributes significantly to growing the next

generation of engineers and scientists. That includes offering teacher workshops to local science teachers, starting in 2010. The workshops use real-world, hands-on experiences, provide classroom curriculum kits and cover instruction methodology. Mixing science with education, ERDC researchers have instructed and mentored teachers, who competed in teams to design and construct products and test their flexibility; analyze crime scenes using forensics; and assemble Lego robots that they programmed to complete a point-to-point course. The teachers then used what they learned to engage their students in real-world scenarios that are educational and fun.

ERDC scientists, engineers and support personnel volunteer their time to go into the classroom, speak about STEM careers and offer specialized instruction. They serve as judges at local and regional science fairs and volunteer hundreds of hours with robotics teams throughout the school year as these students design, build and compete locally, regionally and nationally.

### AN OPEN DOOR TO STUDENTS

Through its educational partnerships, ERDC offers summer employment and on-the-job mentoring, often hiring the students upon graduation from university. Partnerships with JSU, the University of Puerto Rico at Mayaguez (UPRM), North Carolina A&T State University (NC A&T), and the United States Military Academy at West Point (USMA) have provided highly skilled support to the ERDC mission, infusing energy and innovation into research. For example:

- ERDC's partnership with UPRM has resulted in the hiring of more than 40 graduates into the ERDC workforce since 1991. Today, the program

is so well-known at the university that more than 200 students apply for the 36 available summer internships at ERDC. "The university does a great job in selecting students to match ERDC's needs and the needs of the students," said UPRM graduate and ERDC organizer Evelyn Villanueva. Students earn college credit while gaining real-world experience. In addition, she said, they "discover their own potential and establish lifetime relationships with individuals with similar goals."

- Interns with NC A&T have worked on projects as diverse as optimization of barracks huts on military bases, sustainable management systems, energy modeling, equipment models for the Net Zero Energy Installation Project and Net Zero Installation Optimization, and ice thermal storage for fuel savings.
- Through its partnership with JSU, ERDC has hired 20 students over the past two years and annually hosts 35 to 40 incoming engineering students for tours of cutting-edge research projects and facilities where ERDC scientists and engineers interact directly with the students.
- ERDC has hosted cadets from USMA and the United States Air Force Academy. Cadets worked directly with scientists and engineers on current research such as blast-effect acoustics, snow drift studies, advanced concrete investigations for nuclear engineering, life-cycle cost models for insensitive munitions wastewater treatment and survivability technologies that support the warfighter. "As a cadet, working on something that can actually help Soldiers—that's a project worth working on," said Cadet Matthew Shoenberger. "The technologies I've worked with not only save lives, but they make the job of the Soldier easier."



## LIVING PROOF

ERDC's Dr. Jan Hoover answers a question about his estimated 20-year-old sulcate African tortoise, named Century, during his presentation to Mississippi River Home Educators students. (Photo by David Roberts, ERDC)

## CONCLUSION

Testimonials such as Shoenberger's, and positive feedback from students in middle school, high school and college, suggest to coordinators and mentors that ERDC's STEM program is on the right track. In another measure of success, ERDC received the U.S. Army Corps of Engineers (USACE) top STEM Outstanding Team Award in August 2013, one of six awards recognizing ERDC's STEM program and volunteers since the Human Capital Office stood up in 2010. ERDC has also received awards for innovative recruiting, human capital enterprise systems and an outstanding leadership development program.

With the well-documented need for more STEM professionals in the United States, the goal of ERDC's STEM outreach program is to stimulate interest in today's

youth in STEM disciplines and careers. By engaging young students in fun, hands-on activities in summer camps, inspiring them through challenging robotics competitions and mentoring them as student interns, ERDC is making a difference in students' lives.

These students are the workforce of tomorrow, and many may become STEM professionals. Through the combined efforts of its scientists and engineers, and with strong support from leadership, ERDC looks forward to success in growing the next generation of researchers to provide innovative solutions for a safer, better world.

LTG Thomas P. Bostick, USACE commanding general and chief of engineers, has asked ERDC to share information and lessons learned from its STEM

program "for those who may wish to take advantage of these opportunities." (See related article on Page 132.)

*For more information, contact the author at 601-634-3861 or [erdc-hco@usace.army.mil](mailto:erdc-hco@usace.army.mil), or go to [www.erdc.usace.army.mil](http://www.erdc.usace.army.mil).*

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*DR. PEGGY BRASFEILD WRIGHT is the assistant director for human capital at ERDC in Vicksburg, MS. She holds a B.S. in computer science with a mathematics minor from Mississippi College and an M.S. and doctorate in computer science from Mississippi State University (MSU). She is a distinguished engineering fellow with the Bagley College of Engineering at MSU and a member of Human Capital Management for Defense and the Society for Human Resource Management.*





## **MISSION**

**To develop, produce, test, integrate, field, operate and sustain required capabilities for worldwide WMD elimination operations, stockpile and recovered chemical warfare materiel elimination, and domestic response support**

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**An acquisition enterprise delivering agile, tailored capabilities supporting the elimination of WMD, chemical stockpiles and recovered chemical warfare materiel, and domestic CBRN response support**

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\* Assets from the U.S. Army Chemical Materials Activity were placed under operational control of the newly created Joint Project Manager for Elimination (Provisional) on Aug. 5, 2013, and will be fully assigned under the Joint Program Executive Office for Chemical and Biological Defense no later than Oct. 1, 2014.

For more information, contact JPM-E (P) Public Affairs at  
(410) 436-1479 or (410) 436-4292

# ASSESSING S&T

S&T initiatives and capabilities are key factors  
in understanding the health of the industrial base

*by Mr. Eric D. Hoover*

Science and technology (S&T) capabilities are key considerations in industrial base (IB) assessments. To identify and mitigate risks within the IB, it is essential to understand the S&T inputs that support development and production in an industrial sector. The U.S. Army Materiel Command (AMC) community responsible for the Industrial Base Baseline Assessment (IBBA) process uses an integrated research, analysis and assessment approach to identify acquisition strategies focused on developing and sustaining manufacturing abilities within the IB.

The AMC IBBA process divides the technology and manufacturing base into essential components, including workforce skills; production capabilities; material availability; research, development, test and engineering (RDT&E) capabilities; and supply-chain structure. The outputs of this assessment process enable the Army and DOD to proactively identify potential issues and risks to the IB that could impact Soldier readiness.

In a similar vein, IB analysis of the availability and evolution of materials also takes S&T into account, as the availability of materials is critical to developing new technologies. Ensuring the availability of reliable sources of finished and raw materials is a critical task for the IB community, and one of the most difficult tasks. The factors influencing this assessment process are numerous but must include commercial market demands, emerging technologies, DOD requirements and global economic factors.

In sum, identifying the spectrum of potential risks and issues affecting the Army's ability to develop and maintain an IB that can meet our Soldiers' requirements is a complex and challenging undertaking. The assessment scenario can provide the process design and potentially a large number of situational inputs, which in turn enable the IB analyst to illustrate the potential end state of the S&T impacts on the IB.

The following examples highlight how the assessment process takes S&T into account.

## THE MANY FACETS OF IB S&T

The AMC **IBBA Phase I and II assessments**, in 2011 and 2012, respectively, mapped the risks and issues impacting the readiness of the Army's production base. Phases I and II identified risks and issues that became part of the AMC IBBA Phase III project plan in 2013. The plan includes an assessment of the workforce's critical skills. Responses from the chemical, biological, radiological and nuclear (CBRN) sector show that S&T and research and development (R&D) are the two most critical general skill sets in the CBRN private manufacturing sector. If manufacturers have difficulty hiring or retaining S&T and R&D employees, they risk being unable to develop new technologies and production sequences. This hinders their ability to manufacture by creating delays or quality issues.

The 2013-14 development and execution of the CBRN Industrial Base Working Group's **"What If" assessment** will





#### LAB RESEARCH

Crystal Randall, an Army microbiologist on the Edgewood Chemical Biological Center (ECBC) in vitro research team, conducts laboratory research. ECBC plays a leading role in monitoring the CBRN private manufacturing sector. (Photo by Conrad Johnson, U.S. Army Research, Development and Engineering Command (RDECOM))

provide a predictive tool to determine whether IB capabilities at various funding levels are sufficient to meet projected demands. The assessment looks at three time frames—near-, mid- and far-term—with the primary goal of identifying any deficiencies in advance and mitigating the identified risks. For example, the assessment looks at whether current S&T initiatives are available to sustain production and development within the present, near-term and future IB based on evolving requirements. The What-If assessment process seeks to monitor, identify risks and gaps, and provide recommendations on which critical capabilities need to be maintained or nurtured in the IB.

The 2009 DOD **Body Armor Production Base Assessment** incorporated S&T. DOD risked losing production and technology development capabilities

within the body armor sector. The manufacturing base had grown tremendously during the initial phases of Operations Iraqi and Enduring Freedom but began to experience a reduction in requirements. This initiated a parallel reduction within both the manufacturing and development base's production capability and its ability to fund internal R&D. To fully understand the factors influencing this production base, the assessment encompassed internal R&D efforts; component manufacturers, material suppliers and potential alternatives; emerging technologies, such as lighter-weight armor tiles; production capabilities; and redundancies.

The body armor assessment provided senior DOD leadership with an evaluation of the current production base, identification of critical IB capabilities and recommendations for the acquisition strategy

to preserve these capabilities. Without consideration of S&T, DOD might have maintained a production capability that did not have the capacity to advance to the next generation of body armor.

When the IB analyst performs research in support of acquisition, S&T is a factor, as witness two recent assessments: the **Joint Expeditionary Collective Protection (JECPP) Modular System Report** and the **Contaminated Human Remains Pouch Market Capabilities Assessment (CHRP MCA)**.

The JECPP report provided the Joint Program Manager for Protection (JPM P), which manages both JECPP and CHRP, with an analysis of the JECPP prime supplier's surge capability. A company's ability to surge to meet urgent DOD requirements necessitates that the



#### FOCUS ON BODY ARMOR

SGT Stacey Coffield, NCO in charge of the brigade Female Engagement Team (FET), 1st Brigade Combat Team, 101st Airborne Division, demonstrates how her body armor clips together at Forward Operating Base Fenty, Afghanistan, on May 29, 2013. Body armor has been one of the key areas of DOD focus on private-sector R&D capabilities. (Army National Guard photo by SGT Margaret Taylor)

manufacturer's equipment, manpower, supply chain and technology can achieve the projected production output in a short time. The assessment evaluated the thresholds outlined in the JECF critical design review documents in relation to

the production operation. This process included analysis of the manufacturer's corporate processes, equipment, materials, infrastructure and labor capabilities against fragility and criticality criteria to ensure that the supplier could manage

full-rate production and exceed those specified requirements if necessary.

The CHRP MCA evaluated potential manufacturers that could make the CHRP based on design and production capabilities. Vital information, such as key technologies, material availability, workforce skill sets, and the availability of skilled personnel, helped to identify potential designers and producers. The IB team's engineering staff ensured that all necessary capabilities existed, from raw material inputs to product output. The result was the provision of IB data necessary to formulate an acquisition strategy for preserving the IB while supporting the warfighter.

During the 2012 and 2013 AMC IBBA, the AMC IB team evaluated **Rare Earth Elements** (REEs) and **Strategic National Stockpile** (SNS) materials in relation to DOD's IB requirements. The intent was to determine key materials, production and developmental uses, and associated risks, including geopolitical aspects. DOD depends on the application of REE and SNS materials to sustain current and emerging technologies, and must compete with the commercial industrial market for a consistent supply of these materials. The REE assessments encompassed current operations by location, supply availability, domestic processing technology, DOD requirements and emerging technologies.

An FY14 project under development is the **risk assessment of emerging contaminants** being used to produce Soldier products. The advent of new testing techniques, and advancements in chemical and biological engineering, are bringing awareness about the toxicological effects of existing materials. The fact that these materials are fully integrated into the lower supply levels of current production



processes will make identifying them difficult. The Edgewood Chemical Biological Center IB team is collaborating with the Chemical and Material Risk Management Directorate in the Office of the Deputy Undersecretary of Defense for Installations and Environment to develop this project, which aims to provide a sample inventory of the current materials used in DOD chemical and biological products.

## CONCLUSION

The intent of the IB assessment process is to ensure that a responsive IB is present to sustain Soldier readiness. There are numerous inputs into each assessment model, but there are always key indicators that must be part of the assessment. S&T is one of these factors.

It is imperative that the Army IB analyst fully understand the importance of emerging technologies and research efforts that will impact industrial operations within the sector. The overarching objective is the identification and preservation of critical current IB capabilities, while providing insight into RDT&E initiatives that enable the development of new IB capabilities to advance the Soldier's technology edge on the battlefield.

For more information, contact the author at [eric.d.hoover2.civ@mail.mil](mailto:eric.d.hoover2.civ@mail.mil) or 309-782-1077/DSN 793-1077.

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MR. ERIC D. HOOVER is ECBC's Industrial Base Branch chief, Rock Island Arsenal, IL. He holds a B.S. in biology from Henderson State University and an MBA from Saint Ambrose University, and is a graduate of the U.S. Army Logistics Executive Development Course. He is Level III certified in production, quality and manufacturing. Hoover is a member of the U.S. Army Acquisition Corps.



## HAZMAT

Two Soldiers assigned to the 4th Maneuver Enhancement Brigade rehearse procedures for chemical detection during Basic Toxic Agent Training (BTAT) May 7, 2013, at the CBRN Defense Training Facility at Fort Leonard Wood, MO. CBRN is an area where S&T and R&D are the two most critical skill sets for the private manufacturing sector. (U.S. Army photo)



## TARGET PREP

Fred Racine, left, a U.S. Army Research Laboratory (ARL) contractor technician, and Rob Learsch, a Massachusetts Institute of Technology student and ARL summer intern, prepare ballistic targets from new materials supplied by ManTech contractors at Aberdeen Proving Ground, MD, Aug. 14, 2013. IB assessments must take into account the availability of emerging materials and technologies, among many other factors. (Photo by Conrad Johnson, RDECOM)

# Action Plans

A host of stakeholders speak frankly on what the Army needs to do to preserve its industrial base



## QUESTION OF THE DAY

The current and future health of the Army industrial base, against a backdrop of reduced defense spending and continuing national budgetary pressures, was a topic of much discussion at the AUSA Annual Meeting and Exposition in Washington, DC. (Photo courtesy of AUSA)

*Preserving the unique and often highly specialized skills and capabilities of the Army industrial base is critical to the Army and to the nation. In addition to the organic industrial base, companies both large and small in the commercial base offer critical or hard-to-make products and services that ultimately result in critical systems that help maintain the U.S. military's superiority.*

*Yet fiscal austerity is likely to constrain U.S. spending on national security even as the Army faces growing complexities and multifaceted dangers. Some of those companies may be at risk of losing their indigenous capabilities to develop and produce critical goods and services. So, too, may some of the Army's own organic capabilities be at risk of ramping down to the point that they are no longer readily available.*

*"Critical Thinking" generally offers the perspective of a single thought leader from outside DOD and the defense industry on issues faced by the Army AL&T community. Our intent is to provide fresh opinion and expertise on difficult challenges. However, for this issue, we took a slightly different approach.*

*It's clear that, just as the Army's industrial base is broad and complex, so, too, are the interests and concerns of those who work in and around it. With that in mind, rather than reach out to a single individual with multiple questions, Army AL&T magazine reached out to multiple individuals with a single question:*

*In your opinion, what does the U.S. Army need to do in the very short term, in the near term and in the long term to protect the skills and capabilities of its industrial base?*

*Here are the answers from 10 individuals representing a cross-section of big and small defense businesses, think tanks and interest groups. These views are the opinions solely of the individuals and do not reflect the policy or viewpoints of Army AL&T, the U.S. Army or DOD.*



**GREGORY BLOOM**

President  
Seal Science Inc.  
Irvine, CA



**The United States' ability** to provide for the safety and security of its citizenry is being significantly impacted by a silent killer that has received almost no attention—the loss of critical engineering talent and the inability to attract the next generation of scientists and engineers who will make up the Army industrial base.

Misunderstood by many, the industrial base is not just six large prime contractors focused on producing equipment for the Army. The Army industrial base comprises mostly small to mid-sized companies that possess the intellectual property, specialized skill sets and unique technical capabilities necessary to develop the products used by our nation's military. Small businesses employ most of America's best

scientists, engineers and skilled craftsmen to deliver products that make our military the best equipped, most advanced and most effective in the world.

Fiscal austerity is permanently crippling the Army industrial base, specifically the attraction and retention of the high-tech, highly skilled workforce that is the real foundation of the industrial base. The Army will not be able to be reconstitute that workforce when times require.

The defense industrial base has become the consummate underdog in the competition for our nation's best and brightest young engineers entering the workforce. Top graduates who historically entered the defense industry were driven by a desire to serve, an opportunity to work on cutting-edge technology and a reasonable expectation of job security—all at a discount in salary to the private sector.

Today's fiscal crisis is driving an industry drawdown that is different from those in the past. Fewer public dollars means fewer contracts, but it also means less private investment. Investment is needed to hold on to the defense industrial base's essential infrastructure—its people.

Engineers, as very rational individuals, are deciding en masse to leave careers in the Army industrial base as further cuts in defense and reductions in workforce are forecast. Moreover, because of the already scarce supply of STEM [science, technology, engineering and math] graduates, the heavily recruited best and brightest engineers and scientists are choosing careers in social media and in nondefense-related industries.

In order to attract and retain the technical workforce required by the Army industrial base, resources are required to conduct the research and development

[R&D] that allow our scientists to deliver the cutting-edge technology as well as to innovate and deliver future solutions and capabilities that our uniformed military uses in the field. R&D funding is critical in attracting the next generation of scientists and engineers. It provides them with the opportunity to learn on the job from our nation's elite but retiring engineers and to work with cutting-edge technology.

The Army industrial base, with its specialized workforce, must be treated as a national asset and insulated from furloughs, job insecurity and funding uncertainties. Moreover, DOD must develop a long-term industrial base strategy focused on core capabilities that are critical to maintaining technological superiority.

For the first time in modern history, U.S. security is at risk due to the weakness in the total defense industrial base. As a consequence, the nation may no longer be able to produce certain essential military systems and capabilities. Facilities and equipment can be built and replaced relatively quickly—people and skills cannot.

**THE UNITED STATES' ABILITY TO PROVIDE FOR THE SAFETY AND SECURITY OF ITS CITIZENRY IS BEING SIGNIFICANTLY IMPACTED BY A SILENT KILLER.**

**SAMIR MEHTA**

President  
Sikorsky Military Systems  
Stratford, CT



**To protect the skills and capabilities** of its industrial base, the Army needs to focus on two critical areas.

First: Protect your multiyear commitments to the industrial base, even in this fiscally constrained environment. Multiyear contracts allow the Army to reap significant savings through quantity pricing, and they give companies the short-term financial security to continue investing in new technologies and more efficient manufacturing processes.

Very few significant technologies can be developed in the course of a single year, so a revenue stream over more than one year raises the certainty that companies will fund technology development projects that take longer than one year to mature.

More importantly, multiyear contracts allow prime contractors to provide a high

degree of certainty to their own supply base. For many of Sikorsky's small and medium-sized suppliers, predictable revenue maintains company viability.

Secondly, even with the short-term fiscal challenges, the Army cannot lose sight of its longer-term needs. The Army must clearly define the capabilities needed to prevail on the 21st-century battlefield, and allow industry to compete with innovative solutions and advanced technologies.

Without definition, the danger arises that those who work projects within a constrained budget environment will bring an unprecedented level of influence to a short-term focus.

The long-term view will mean protecting future programs like the Army's Armed Aerial Scout (AAS) helicopter, or the Joint Multi-Role/Future Vertical Lift (JMR/FVL) program that seeks to replace the Black Hawk and Apache helicopter fleets in the mid 2030s.

Programs like AAS and JMR/FVL stimulate industry's top technical minds to develop game-changing technologies.

Currently, an entire generation of engineering and technical talent could languish without ever working on a new-start, next-generation rotary-wing program. That is dangerous and shortsighted, and could "level the playing field" as it relates to our country's current and future combat operations.

A clearly defined long-term view is required if companies are to continue their willingness to speculatively invest millions of dollars in R&D, without which our nation's industrial base and long-term military superiority are at risk.

**GEN GORDON R. SULLIVAN  
(USA, RET.)**

President  
Association of the United States  
Army (AUSA)



**As I reflect upon my time** as chief of staff, I can remember an important message I shared with representatives of industry at AUSA's Winter Meeting two decades ago. It still rings true today: "We must combine forces, leverage our resources and make the best decisions for the welfare of our Army and our nation." Now, as AUSA's president, I'm even more convinced that the Army's partnership with the industrial base is key to success.

Many of the unsung heroes of the wars in Iraq and Afghanistan reside within the industrial base, which includes the 23 geographically dispersed government ammunition plants, manufacturing arsenals and maintenance depots that comprise the Army organic industrial base (AOIB), as well as commercial enterprises small and large. Their significant contributions to materiel readiness ensured that members of the joint force had the tools needed to accomplish the mission.



**MARK DeYOUNG**

President and CEO  
ATK  
Arlington, VA



A healthy industrial base with the depth, breadth and diversity needed to support the joint warfighter—today and in the future—remains paramount to sustaining military operations in an uncertain, complex national security environment. Senior leaders face a difficult fiscal environment that requires hard decisions about how to prioritize spending on personnel, readiness and modernization.

A focus on four key areas—capacity, capital investment, modernization and workload—will chart a path for the future of the AOIB. This will allow the Army to leverage best business practices; maintain an experienced, skilled and specialized workforce; make prudent investments in modern, safe and capable infrastructure and equipment; and ultimately provide the capability for the joint force. Likewise, commercial enterprises that best meet the emerging readiness and modernization requirements of the joint force and embody best business practices to maximize return on investment of taxpayer funds will have the best prospects, now and in the future.

The secretary of the Army and the chief of staff of the Army said it best when they testified before the Senate Armed Services Committee in April 2013: “The ability to reduce the industrial base in times of peace but surge as required remains essential to equipping the Army, the Joint Force and, in many cases, our allies and coalition partners.”

*For more information, see AUSA’s Torchbearer Issue Paper “The Army’s Organic Industrial Base: Providing Readiness Today, Preparing for Challenges Tomorrow,” at <http://www.ausa.org/publications/ilw/DigitalPublications/Documents/tbip-aoib/index.html>.*

**A capable, responsive and resilient** industrial base is essential to the national security of the United States. In order to retain the essential skills that underpin the base, there are five fundamental enablers that should be considered and incorporated into the Army’s approach, now and in the future.

First, maintain and expand an open and active dialogue between the Army—particularly acquisition managers—and industry. With data points that include product inventories, consumption rates, potential impacts due to force size reduction, and training or doctrine requirements, industry can make informed decisions that support the preservation of industrial base capability.

To assist in the open dialogue, use and improve industrial base tools developed by joint life-cycle commands.

One example is the Minimum Sustaining Rate database that helps identify the production and support levels necessary to avoid placing the industrial base at serious risk.

Second, an acquisition policy that incentivizes innovation, preserves intellectual property rights and streamlines contracting practices would improve and sustain the industrial base. Meaningful dialogue on long-term plans, ensuring a steady flow of information to inform industry planning and investment, is a necessary element of this policy. Also, it is necessary to address Army and DOD policy regarding competition and maintaining multiple sources for products. History demonstrates that repeated competitions and smaller awards to multiple suppliers present serious challenges for industry that can swiftly erode capability and threaten the health of the supply chain.

Third, adequately funded programs and realistic requirements are essential. With clear and concise program requirements and plans, industry not only focuses on delivering key performance parameters and controlling cost, but also can more efficiently identify and develop critical skills to meet current and emerging needs.

Fourth, increasing the Army’s support for international sales could reduce and/or sustain current production costs. The resulting expanded market for U.S. military products would help lower procurement costs to the Army while helping sustain the domestic manufacturing base.

And finally, the Army, along with the other services, should continue to explore new ways to work productively with industry, academia and local communities to support STEM education. Investing in STEM education initiatives will help our nation attract, train and retain the next generation of innovators and skilled workers needed to lead the industrial base of the future.

**MICHELLE J. LOHMEIE**

Vice president, Land Combat,  
Raytheon Missile Systems  
Tucson, AZ



**I believe the Army and industry** face similar challenges associated with sustaining the defense industrial base, and share responsibility for putting together collaborative, forward-leaning solutions that establish the right balance of investments in technology and talent.

In the case of technology, the Army must fully implement the recommendations put forward in its latest industrial base study. For example, the Army has made protection of the Abrams main battle tank industrial base a priority and is investing in key subsystems accordingly. The precision munition and missile industrial base is particularly reliant on technologies that exist in the sub-tier supplier base. Going forward, Army and industry must work jointly to identify

critical, at-risk companies and develop road maps for sustaining investment in them during the downward trend in defense spending.

In addition, industry must challenge itself to retain a tight focus on evolving core capabilities and products in a way that increases capability and reliability while reducing cost. This aligns well with our desire to further optimize operations and deliver even more value to the Army acquisition customer.

DOD and industry must also face head-on the dual challenge of a decline in new college graduates with technical degrees and the aging of our respective workforces. Companies like Raytheon have launched STEM initiatives, ranging from middle school to university, that encourage young Americans to enter math and science fields. In addition, we need to find ways to make a career in defense more appealing to young, tech-savvy people with lots of career options. We have a compelling story to tell about developing innovative solutions that protect our warfighters and secure America and our allies in an uncertain world.

Combined with a focus on sustaining key technologies, a joint approach to building the defense workforce of the future will be critical to protecting our industrial base.

**"...WE NEED TO FIND WAYS TO MAKE A CAREER IN DEFENSE MORE APPEALING TO YOUNG, TECH-SAVVY PEOPLE WITH LOTS OF CAREER OPTIONS."**

**DR. RON ROSEMEIER**

CEO

Brimrose Corp. of America  
Sparks, MD



**The global battlefield** as we know it is changing rapidly, and the American Soldier must be equipped to stay ahead of the enemy. As global technology and information become more commonplace, the ability to stay ahead is becoming more challenging. Therefore, it makes sense for the Army to look to smaller companies as it faces reduced funding allocations, because they don't require the larger funding leads that bigger companies do.

At Brimrose, we are focused on helping the Army stay ahead in the technology race, to keep its edge in terms of critical battlefield thinking. We place tremendous effort in moving rapidly from concept to instrumentation. If we receive \$500,000 to \$1 million, that goes a lot further than it would for a larger company, which might require several times that amount to do the same thing.





For example, we are studying our leading-edge unmanned aerial vehicles and exploring innovative ways to use and control them. Further out, we have initiated tests in which drones can literally be controlled by the brain waves of Soldiers in the field. This kind of technology already is being used to help wounded warriors control artificial limbs with their thoughts. Complementary to that, we are studying how a Soldier thinks in the field, how he or she responds to stress, and what he or she can and cannot handle.

Are these at the outer limits of conventional warfare thinking? The answer is yes. But a lot of people thought Thomas Edison was crazy because he was ahead of his time. Smaller companies can move faster and move resources more rapidly, and they are unlikely to have resources tied up by the bureaucracies that plague some larger companies.



### BUILDING STEM SKILLS

Donna Bulger, associate director for operations and outreach at the Natick Soldier Research, Development and Engineering Center, watches a demonstration of a robot built by Natick High School students participating in a STEM project in 2013. STEM initiatives are foremost on the minds of many who are concerned with the Army industrial base as they consider the future of the industrial base workforce. (U.S. Army photo)

### MICHAEL E. O'HANLON

Senior fellow, Center for 21st Century Security and Intelligence  
Director of research, Foreign Policy program  
Brookings Institution  
Washington, DC



**In assessing the health** of the national security industrial base, we can take several approaches, each of which has its own value:

- Try to preserve defense employment in general, especially in a time, like the present, of national economic difficulty and need for federal fiscal stimulus. In other words, try to save jobs.
- Seek to preserve the immediate capacity of our industrial base to ramp up production fast in the event of a national security surprise.
- Attempt to keep key manufacturers in crucial areas of industrial capability as healthy as possible.
- Promote ongoing technological advancement by paying special heed to those parts of industry that are also pushing forward scientific and technological frontiers, with linkages to R&D and basic science activities.

Because these industrial base goals are quite different from one another, it is

important to be clear about which ones a given policy might support. As a general proposition, the latter two are of greater concern to me than the first two, in light of scarce defense dollars and downward pressure on Pentagon budgets, combined with our generally adequate inventories of advanced military gear today. This is especially true for many ground combat systems, which, while extremely important to our nation, may not always need to be as technologically sensitive or advanced as, say, stealth aircraft or nuclear submarines or tilt-rotor aircraft.

As such, without disregarding the first two concerns entirely, I would submit that we focus more on advanced, avant-garde and/or endangered technologies. How to do this? In its “Annual Industrial

Capabilities Report to Congress” (2012 edition), DOD lists a number of areas of military technology and manufacturing capacity that it deems to be at risk, given trends in overall defense budgets as well as specific developments within the Pentagon’s acquisition accounts. These areas of technology are rather specific in some cases and include the following:

- Heavy forgings.
- Heavy castings.
- High-precision bearings.
- High-temperature and low-temperature co-fired ceramics.
- Rare earth elements.
- Long-range cruise missile propulsion technologies.
- Tri-mode seekers.
- Solid rocket motors.

- Thermal batteries.
- Rayon precursor material.
- Triaminotrinitrobenzene explosive.
- Advanced fuzes.
- Ammonium perchlorate.
- Butanetriol trinitrate propellant.

This list is a good place to start. It is not the end of the debate, to be sure. But by mapping various Army-related manufacturing capabilities against the above list, we can perhaps construct a first draft of those technologies that most require our vigilant oversight and perhaps even our nurturing. And then, with that first draft in hand, we can move on to a second draft. But there needs to be a place where we begin.

### LT GEN LAWRENCE P. FARRELL JR. (USAF, RET.)

President  
National Defense Industrial Association  
Arlington, VA



**The Army, like the other services,** is facing a big hill. Continuing pressure from the 2011 Budget Control Act (BCA), combined with the sequester, is squeezing needed funds as the Army faces a tough transition from continuous war to the need to reset the force. One major issue in the transition is the health of the industrial base in a downsizing environment. The latest budget deal provides some breathing room in BCA budget caps. How, then, to protect critical capabilities in the base?

A first step is to recognize that company downsizing, defense business exits and consolidation are certain. So we need a way to assess the likely impact of federal budget levels on critical suppliers.

A model program for this already exists in the munitions area. A few years ago, the Joint Munitions Command (JMC) and industry undertook a collaborative project to develop assessment tools for the situation we face today. One of these, the Industrial Base Assessment Tool, provides the ability to identify the impact of a given budget on a specific product area. Another tool, the Minimum Sustaining Rate tool, permits the JMC and the Single Manager for Conventional Ammunition to identify the impact on key production facilities (read: businesses).

These methods, if expanded and applied to other Army industrial base sectors, would go a long way toward ensuring the survival of critical indigenous capabilities in the Army industrial base.



**GREGORY GLAROS**

CEO  
SYNEXXUS Inc.  
Arlington, VA



**In my experience** as a former DOD executive and combat veteran, determining and defining an industrial base's near-term and lasting value was critical to deciding how a requirement was established and to what extent the American industrial market could meet those requirements. There is a misperception in the defense community—both on the procurement side as well as the industrial base—that the commercial or defense market should be able to answer all requirement needs if DOD could just write a better requirement or invest in the necessary infrastructure absent a requirement.

Unfortunately, specifying a better requirement demands that those responsible for authorship are capable of predicting a future threat, and securing infrastructure

investment assumes that the need will be imminent or takes years to procure. But the time invested in guessing about the future will not produce a better force structure—nor will it matter, if the nation pays for infrastructure designed for the wrong future.

The alternative approach to ensuring a responsive call to arms is based on investments in the practical sciences—electrical and mechanical engineering, electronic engineering and chemistry—rather than basic sciences. These skills serve to germinate a community that is available for today and is necessary to prepare a workforce for the future. Lasting employment in these science fields occurs through rapid fielding, constant experimentation and iterative designs for the creation of new products over time.

A lasting industrial base, then, is one that can employ and train these skills. It is one that allows for failure through trying, creation through doing, and success by iterating product design—without depending on a single funding source. An industrial base solely dependent on defense funding, making payroll by delivering existing products at a slow, steady rate, will not survive a competitive market.

In my experience as a current corporate leader, making payroll is accomplished by investing in the future through workforce education, steadily delivering new products and participating in or creating new markets. This is not done through reliance on grants from the federal government or by paying the high cost of doing business with the services, but by preserving and reinvesting profits in workforce skills and in new product development.

The question should be: To what extent has a company invested in its own future? How much does it cost to do business

with the Army? How long does it take to get on contract? How many innovative, small and agile, product-oriented companies are being nurtured?

Disproportionate payments to training serve to secure a workforce for today; service-related contracts solve current problems; and funding laboratory facilities keeps bases open. But none of these fuels a future. Perpetuating a current product base made for a threat that is long past, rather than by investing in the future, serves only to prolong the inevitable. The best near-term protection against an unknown future is through funding the practical science skills in engineering, and more reliance on industrial commercial standards as a guide.

**AN INDUSTRIAL  
BASE SOLELY  
DEPENDENT ON  
DEFENSE FUNDING,  
MAKING PAYROLL  
BY DELIVERING  
EXISTING  
PRODUCTS AT A  
SLOW, STEADY  
RATE, WILL  
NOT SURVIVE  
A COMPETITIVE  
MARKET.**



## FLEXIBILITY IS KEY

Secretary of the Army John McHugh testifies before the House Armed Services Committee April 25, 2013, about the FY14 national defense budget authorization. McHugh and Army Chief of Staff GEN Raymond T. Odierno, left, told Congress last spring that being able to reduce the industrial base in times of peace but surge as required is vital to equipping the Army, the joint force and, in many cases, our allies and coalition partners. (U.S. Army photo by SPC John G. Martinez)



## FOUNDATION OF THE BASE

With more than 600 machines, some dating to the 1940s while others reflect today's state-of-the-art technology, Watervliet Arsenal, NY, is representative of the Army's organic industrial base in relying heavily on those who keep the machines running, such as Joseph DeCrescenzo, left, an industrial control electronics mechanic, and James Best, an electrical technician. Together, they have more than 41 years of mechanical experience at the arsenal. Many of the unsung heroes of the wars in Iraq and Afghanistan reside within the industrial base, both the organic and commercial segments, as AUSA President GEN Gordon R. Sullivan (USA, Ret.) notes. (Photo by John B. Snyder)



**EUGENE GHOLZ**

Associate professor of public affairs  
Lyndon B. Johnson School of Public Affairs  
University of Texas at Austin



*(Editor's note: From 2010 to 2012, Gholz served as senior adviser to the deputy assistant secretary of defense for manufacturing and industrial base policy.)*

**The Army needs** a political game-changer. Too many of its proposed acquisition budget adjustments have foundered in Congress. For its part, Congress has seen too many well-intentioned but overambitious investment plans end in technological failures. Representatives are inclined to

go with what they know works, which also happens to prop up government spending in their districts. Meanwhile, prime contractors' experience tells them that continuing production is the reliable way to profits. The industry's poor working relationship with its DOD customers in recent years makes it hard to trust an alternative path forward.

So when the Army proposes to temporarily suspend the production of tanks, infantry fighting vehicles or

trucks—the warfighter has enough right now—the legislative process recoils. Rather than giving the Army authority for targeted investments to right-size facilities, improve the manufacturing process or allow workers to practice critical skills, Congress directs spending for procurement of long-lead items and otherwise ties the industrial base to current production.

The Army and the nation would be much better off with the targeted investments. This alternative would cost less, because it would not require as much material or large-factory overhead. And each dollar spent would be much more likely to go to a critical capability, whether in engineering, facilities improvement or high-end workforce skills. The Army would still allow prime contractors to profit. Critical subcontractors would also work directly with the team.

Everyone wants to help fragile niches in the defense industry. But instead of a three-way working relationship among industry, Congress and the Army, the Army has been the odd man out of the political coalition. The key remedy is for the Army to rebuild trust with its industry partners; if industry and the Army are on the same page, Congress will follow.

The Army has been working on it for several years, but the job is far from done. Badgering industry for short-term overhead savings, blaming industry for program difficulties and trying to shift program risk to contractors all just reinforce industry's embrace of traditional lobbying strategies. It is time for a new partnership.

?

# PLANNED EVOLUTION

How the workforce of Corpus Christi  
Army Depot repositioned itself for tighter times

*by Mr. Curtis Titus and Ms. Brigitte Rox*

Since 2011, Corpus Christi Army Depot (CCAD) in Texas has made sweeping changes to its business culture and practices that not only reduced the depot's consumption of government funds and material resources, but also positioned CCAD to continue providing top-quality support to the nation as military spending diminishes.

The U.S. government cannot afford to purchase new aircraft for each mission. Rather, it must rely on the organic industrial base (OIB) to modify aircraft and components to handle the specific needs of the next mission. As the largest helicopter, engine and component maintenance facility in all of DOD, CCAD has a number of capabilities found nowhere else, including its state-of-the-art bearing reclamation facility and transmission test facility, the only one capable of testing AH-64D Apache, UH-60A/L Black Hawk, CH-47D Chinook and OH-58 Kiowa transmissions. It can also provide overhaul, repair and modification of rotor heads and controls for any joint-service helicopter. CCAD's workforce of some 5,000 civilians continues to evolve by adding capabilities that will be needed for the future of defense.

The drawdowns from Iraq and Afghanistan, coupled with reduced budgets, have signaled a number of challenges for the

Army and for CCAD. The depot's workforce has met those challenges by treating the OIB as a business and finding smarter, more efficient ways to invest in its people and technology, in the spirit of better buying power.

With a complete organizational restructuring, strategic planning and fundamental cultural change, CCAD shook off a complacency that had developed over years of high-volume operations and prepared the organization to weather current and future storms.

## THE PRICE OF PROSPERITY

After 9/11, CCAD thrived in a war-driven climate for 10 years, maintaining the Army's aviation capability for the UH-60, CH-47, AH-64 and OH-58. CCAD experienced exponential growth, with a tenfold increase in production orders and a sixfold increase in revenue between FY03 and FY11.

CCAD welcomed this spike in production, but the volume created process and capacity issues that had to be resolved quickly. Initially the depot responded by spending more money and hiring more contractors to alleviate the issues, but this strategy could not be a stable, long-term solution while the





### TRANSMISSION POWERHOUSE

CCAD employee Frankie Thomas machines the main transmission housing for an AH-64 Apache. CCAD is the largest helicopter, engine and component maintenance facility in all of DOD. (Photos by Ervey Martinez, CCAD)

root of the issues remained. Meanwhile, labor rates shot up. This push to produce also compromised the depot's financial responsibility to the customer, employee development, product quality and continuous organizational improvement.

The depot's rate of production would not be sustainable in the long run if the workforce failed to adapt its business practices to peacetime operations and limited budgets. This would compromise CCAD's status as a premier

aviation maintenance facility, which could lead to a loss of work, capabilities and human capital.

CCAD responded to this challenge in 2011 with an organizational restructuring to shore up weak points in internal communication. Depot personnel paired this with the launch of an internal messaging campaign encouraging a professional recommitment to the depot's core values of financial responsibility, customer service, product quality,

employee empowerment and organizational improvement.

This outline, known as the balanced scorecard, became the CCAD standard by which all production and support areas were measured continually. (See Figure 1 on Page 100.) This plan would enable the depot to achieve organizational change, increase production rates and lower costs to survive the effects of reduced budgets and fewer troops in Iraq and Afghanistan.





### DOUBLE CHECK

Jose "Joey" Reyes verifies the serial numbers for T-700 engines, which are used on the AH-1 and UH-60 helicopters. CCAD has a civilian workforce of about 5,000.

The plan called for:

- A depotwide evaluation and reorganization based on benchmarking commercial industrial organizations.
- Business metrics of performance.
- Organizational culture change.
- Cost-consciousness.
- Continuous process improvement.
- Investment in human capital, including leadership and professional development.

### BUILDING A NEW CULTURE

CCAD's long-term viability required a comprehensive reorganization to align its processes while ensuring integration of the Logistics Modernization Program (LMP) into its core business functions. A team of experts designed a new

organizational structure that would better align with the six core processes of LMP (order fulfillment, demand and supply planning, procurement, asset management, materiel maintenance and financial management). They reviewed organizational studies and interviewed subject-matter experts and aerospace industry leaders. They developed a business case, rules for change and a staffing plan based on the new structure.

The team also developed an Army staff structure for industrial support operations by coordinating with the depot's higher headquarters at the U.S. Army Aviation and Missile Life Cycle Command and Army Materiel Command. Then they adjusted the Table of Distribution and Allowances to conform with the new

structure, and rewrote CCAD's missions and functions.

Any change of the magnitude of deploying an enterprise resource plan (ERP) requires a depotwide culture overhaul.

To achieve this, CCAD needed a sound and established method to guide the organization toward the business's new direction. Inspired by the leadership and business theories taught by Dr. John P. Kotter, professor of leadership, emeritus, at Harvard Business School, CCAD developed a plan to lead change. With a goal to be better, faster and cost-effective, depot leaders introduced the workforce to Kotter's concept of "the big opportunity" to create a sense of urgency.





#### BOTTOM-UP EFFICIENCY

Tony Fernandez, left, and Daniel Perales check a T-700 engine for leaks. By encouraging employees to volunteer their ideas for improvement and sponsoring teams of volunteers to lead change, CCAD fostered a shop-floor culture of cost- and time-consciousness.

CCAD's former commander, COL Christopher Carlile, implemented a strategic internal communications campaign through his public affairs team to achieve visibility and strengthen the sense of urgency within the workforce. The commander made sure that he had senior leadership buy-in to successfully deploy the reorganization. He communicated the overhaul to his workforce at every level, actively engaging with employees to incorporate their feedback and suggestions in developing the plan.

One aspect of this campaign involved a depotwide survey to evaluate the workforce's attitudes toward the current organizational structure. The results showed that 98 percent of employees were

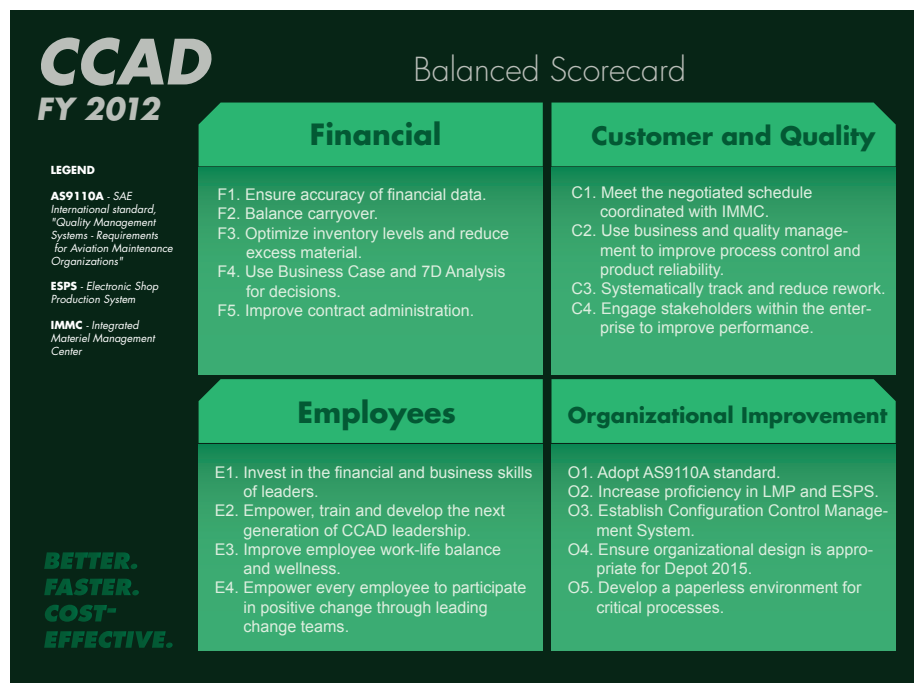
dissatisfied with the current work climate and wanted to see improvements that would maximize production and support at the lowest cost and with the quickest turnaround possible. At that point, the commander deployed a program to encourage employees to volunteer their ideas for improving and shaping the products and processes they knew best. Teams of volunteers, known as "leading change teams," became active in clearing obstacles and achieving quick wins more effectively than any methods used in the past.

CCAD previously had established an Office of Continuous Improvement with staff specially trained to streamline processes. While the office achieved savings through a number of "quick win" efforts

such as hosting projects in production shops, these event-driven projects fell short of promoting a cost-conscious culture at the shop-floor level. The change teams were much more successful, as they relied on employees with the drive to improve the jobs they were doing. The depot invested in these teams by providing them Lean Six Sigma training and by joining teams of like-minded employees so they could ignite improvements in their shops.

This concept had an immediate impact on the workforce as they turned their ideas into reality. One change team resolved long wait times at base gates by staggering work shifts. Another team made quality improvements in aircraft assembly and flight test. One team

FIGURE 1



### POINTING THE WAY

In 2011, CCAD set the stage for a professional recommitment to its core values with this balanced scorecard, which became the organization's standard by which all production and support areas would be measured continually. The goal was to enable the depot to achieve organizational change, increase production rates and lower costs to survive the effects of reduced budgets and fewer troops in Iraq and Afghanistan. (SOURCE: CCAD)

reduced equipment duplications and established a free-issue site to redistribute available equipment effectively. By the official launch of the reorganization on Sept. 1, 2012, the CCAD workforce was already demonstrating how effective an employee-led, cost-conscious culture could be.

### CASE IN POINT: BLACK HAWK RECAP

These organizational strides were key to the success of CCAD's UH-60 Black Hawk recapitalization program, which represents just one example of how CCAD is achieving the highest possible return on capital assets and investments.

The depot has become the cornerstone of sustainment for the Army's Black Hawk fleet. The Black Hawk recap program, introduced more than a decade ago, maintains the Army's combat readiness by updating aircraft already in the inventory to meet the evolving requirements of modern warfare. Recap, part of the Army's efforts to reduce platform sustainment costs, avoids the expense of replacing aging helicopters with new ones.

Specifically, CCAD's Black Hawk recap program saves taxpayers approximately \$12 million with each rebuild. Since 2003, the program has saved the taxpayer more than \$20 billion, cutting

time and costs while making smarter choices in workload.

CCAD's new proactive and efficient culture enabled the workforce to recapitalize more Black Hawks than ever—50 A-to-L models—by improving systems and processes in workshops with innovative technology, lean methodologies and best business practices. The Aircraft Support Division, for example, reduced turnaround time 17 percent in FY12, and the trend continues today.

CCAD did not expect to have the capability to produce 50 A-to-L-model Black Hawks until FY15, having achieved only 48 aircraft the year before. Now the depot is also rebuilding U.S. Air Force Pave Hawks, as well as Customs and Border Protection Blackhawks, and is in talks to include the U.S. Navy and Coast Guard in the recap program.

In another example of newfound efficiencies at CCAD, during FY12, UH-60 main rotor blades were not available in sufficient quantities to maintain fleet readiness. Despite numerous space and capacity constraints, the depot ramped up output within 90 days. By maximizing workflow and increasing productivity, CCAD was able to increase monthly production on Black Hawk blades from 120 to 160.

Measured another way, in FY11 the Rotary Wing Division increased monthly production of Black Hawk main rotor blades by 43 percent, from 70 to 100 blades. In FY12, UH-60 tail rotor blade production increased 18 percent, from 85 to 100. AH-64 main rotor blade production increased 50 percent, from 40 blades in FY11 to 60 in FY12. Altogether, the division increased production by 30 percent in one fiscal year without incurring any additional cost or expansion.





### PRECISION SPECIFICATIONS

Marcus Johnson works on a twist angle machine, straightening a power turbine shaft in preparation for examination and evaluation. CCAD has the only facility in DOD that can test AH-64D Apache, UH-60A/L Black Hawk, CH-47D Chinook and OH-58 Kiowa transmissions.

Overall, FY12 was CCAD's best year for continuous improvement in its history. The workforce shattered the original goal of achieving \$50 million in financial benefits by executing 49 projects valued at \$65.1 million in internal cost avoidances and savings to their customers.

### CONCLUSION

The CCAD workforce has demonstrated the synergistic effects of an enterprise approach to operations. By reorganizing and transforming its business culture, CCAD has positioned itself to survive the drawdowns and the downturn in military spending and be ready for the future, reducing the overall costs of aviation and turning every dollar saved into more capability for the Army.

Leaders now have a way to measure depot operations against commercial industrial benchmarks using a proven ERP. An established balanced business scorecard allows leadership to routinely assess the depot's commitment to and success of its priorities and values. Managers and leaders can measure individual and team performance through transparent business metrics, enabling them to reward top performers and correct areas of concern.

By transforming their collective mindset from a culture of complacency to one of activism and cost-consciousness, the CCAD workforce achieved savings in cost, schedule and human capital while maintaining the superior quality for which CCAD is known.

For more information, go to <http://www.ccad.army.mil/> or call the CCAD Public Affairs Office at 361-961-3627.

*MR. CURTIS TITUS is chief of CCAD's Administrative Support Division. He served as management analyst for the CCAD Reorganization Team and later as executive assistant to the commander. He has a B.A. in general science from Excelsior College. Titus is a retired NCO who served in the Army for 20 years as a counterintelligence agent.*

*MS. BRIGITTE ROX is a public affairs specialist at CCAD. She holds a B.A. and an M.A. in English from Texas A&M University – Corpus Christi, where she also studied journalism.*

# ‘MoB’ RULES

PdM SKOT develops ‘make or buy’  
guidance for best value

*by Mr. Steve Le Febvre*

**T**he reality of shrinking budgets for the Army demands innovative acquisition approaches to ensure that Soldiers get the capabilities they need. One area that the Product Manager Sets, Kits, Outfits and Tools (PdM SKOT) is focusing on is understanding and balancing the commercial and organic industrial bases, but it is not always easy to decide between their two very different production capabilities in a way that best serves Soldiers and taxpayers alike.

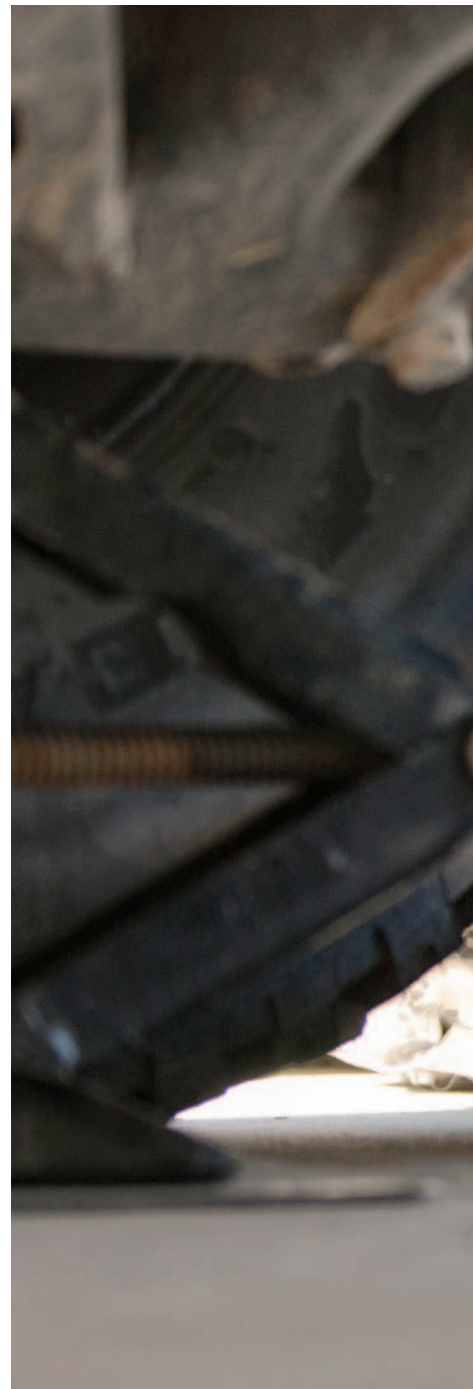
PdM SKOT, assigned to the Project Manager (PM) Force Projection of Program Executive Office Combat Support and Combat Service Support, recognized this challenge and developed a process to improve analysis of competition between Army arsenals or depots and commercial manufacturers for new acquisition and re-procurement programs. This new process responds to Title X U.S. Code, Section 4532, “Factories and arsenals: manufacture at; abolition of,” known as the Arsenal Act. It requires that supplies be made at government facilities if those facilities can produce on an “economical basis.” While the law seems

straightforward, interpreting it can be challenging for acquisition professionals. That’s because of the relative difficulty in accurately comparing commercial manufacturing sources to organic arsenals and depots, and justifying an organic source as being capable of economical production.

A May 2, 2013, memo, “Using Army Arsenals,” from Heidi Shyu, assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)), also highly encourages program managers to use the organic industrial base when possible. Army Regulation 700-90, “Army Industrial Base Process,” further clarifies that AL&T professionals shall meet the intent of the Arsenal Act by performing a “make or buy” (MoB) analysis, but it provides no exact methodology for a MoB decision. In an attempt to fill this gap, PdM SKOT developed a process aimed at providing sound, step-by-step guidance for Army AL&T professionals implementing MoB decisions.

## **A RIGOROUS PROCESS**

PdM SKOT’s solution is a rigorous analytical process modeled after the basic logic from Defense Acquisition



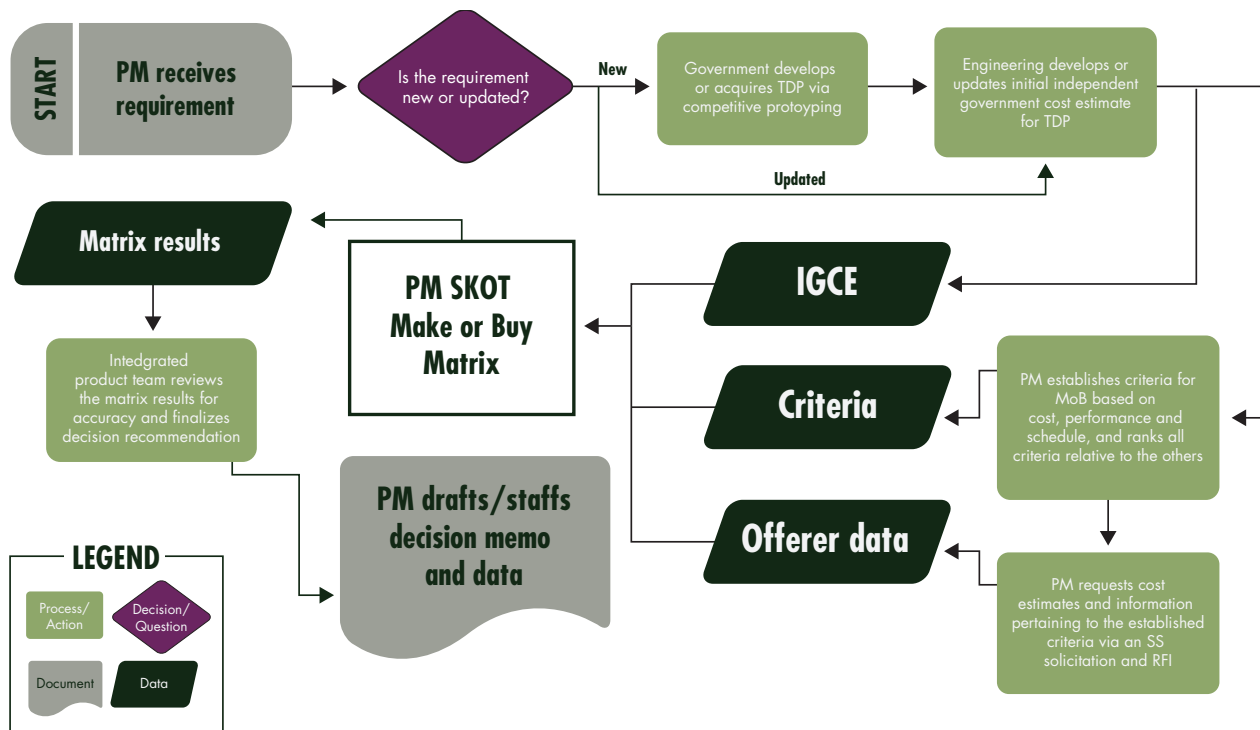




#### TOOLS OF THE TRADE

SPC Mitchell Fromm, a combat engineer with the 428th Engineer Company and winner of the 2013 U.S. Army Reserve Best Warrior competition in the Soldier category, prepares to change a tire on a High-Mobility Multipurpose Wheeled Vehicle during the Nov. 20, 2013, competition. PdM SKOT provides portable tool kits for maintainers and combat engineers. (Photo by SGT Clifford Coy, 364th Public Affairs Operations Center)

FIGURE 1



Note: The IGCE is used to measure and compare proposal costs for reasonability. The quantifiable criteria are used to differentiate among proposals and find value for the government. The matrix generates a recommendation based on the IGCE, criteria and industry data.

### MoB DECISION MAP

PdM SKOT's MoB process responds to Army guidance encouraging program managers to use the organic industrial base when possible in procurements. The process mirrors DAU guidance for SSBs, with further definition of specific criteria for a MoB decision related to program cost, performance and schedule. (SOURCE: Steve Le Febvre, PdM SKOT)

FIGURE 2

Criterion vs. Criterion	Cost	Performance	Schedule	Raw Total	Relative Decimal Value
<b>Cost</b>		<b>2.00</b>	<b>2.00</b>	<b>4.00</b>	<b>0.53</b>
<b>Performance</b>	<b>0.50</b>		<b>2.00</b>	<b>2.50</b>	<b>0.33</b>
<b>Schedule</b>	<b>0.50</b>	<b>0.50</b>		<b>1.00</b>	<b>0.13</b>
<b>Grand Total</b>				<b>7.50</b>	

**Criterion vs. Criterion Weighting "Key"**

- 1 = Equally important
- 2 = Slightly more important
- 3 = More important
- 4 = Much more important
- 1/2 = Slightly less important
- 1/3 = Less important
- 1/4 = Much less important

**Relative Decimal Value (RDV) Calculation for Criteria:**  

$$RDV = (Raw\ Total) / (Grand\ Total)$$

### SCORING THE ALTERNATIVES

The process of scoring the MoB alternatives involves weighting the main cost, performance and schedule criteria in accordance with the needs of the program. The raw scores are translated into RDVs for direct comparison to other offerors' scores in the final analysis. (SOURCE: Steve Le Febvre, PdM SKOT)



FIGURE 3

Summary Matrix: Options vs. All Criteria	Final Cost Scores	Final Performance Scores	Final Schedule Scores	Raw Total	Final Total RDV Score	Final Ranking
<b>Arsenal A</b>	<b>0.163</b>	<b>0.086</b>	<b>0.020</b>	<b>0.269</b>	<b>0.269</b>	<b>1</b>
<b>Corporation 1</b>	<b>0.154</b>	<b>0.049</b>	<b>0.025</b>	<b>0.228</b>	<b>0.228</b>	<b>3</b>
<b>Corporation 2</b>	<b>0.015</b>	<b>0.049</b>	<b>0.025</b>	<b>0.089</b>	<b>0.089</b>	<b>4</b>
<b>Corporation 3</b>	<b>0.170</b>	<b>0.049</b>	<b>0.020</b>	<b>0.239</b>	<b>0.239</b>	<b>2</b>
<b>Corporation 4</b>	<b>0.015</b>	<b>0.049</b>	<b>0.025</b>	<b>0.089</b>	<b>0.089</b>	<b>4</b>
<b>Corporation 5</b>	<b>0.015</b>	<b>0.049</b>	<b>0.020</b>	<b>0.085</b>	<b>0.085</b>	<b>6</b>
<b>Grand Total</b>				<b>1.00</b>	<b>1.00</b>	

### FINAL ANALYSIS

This sample summary matrix compares offerors' scores for the final analysis leading up to a MoB decision. Raw data entered into the matrix provide a recommendation to either buy commercially or make organically. The PdM team reviews the process for accuracy and makes a formal recommendation to the MDA based on the matrix findings. (SOURCE: Steve Le Febvre, PdM SKOT)

University (DAU) guidance for source selection boards (SSBs). PdM SKOT and key program stakeholders further defined specific criteria with regard to program cost, performance and schedule, and created a prioritization matrix to assess alternatives. (See Figure 1 on Page 104.)

The SSB process was helpful in providing an established, accepted methodology for selecting between commercial manufacturers. PdM SKOT applied it to a new process.

The MoB process begins when the program office receives a requirement for procurement. If the requirement is new, acquisition professionals must either internally develop or acquire, via competitive prototyping, a full, manufacturable, technical data package (TDP). The government then can use the TDP to create an independent government cost estimate (IGCE).

Next, the team must establish quantifiable, meaningful criteria and sub-criteria based on program needs. These criteria form a mathematical matrix used to compare offers directly and to strip away bias and emotion from the decision-making process. As with the source selection process, the PdM SKOT MoB criteria do not focus solely on the lowest-cost bid for the program. In the case of PdM SKOT, the purpose of the criteria and sub-criteria is to judge an offeror's ability to meet program needs with regard to cost, performance and schedule. For example:

- **Cost**—Criteria should, at a minimum, include an out-the-door cost for each item. Depending on the complexity of the program, a full breakdown of material and direct labor is preferable.
- **Schedule**—Criteria are easily quantifiable and should include questions regarding lead times and production

capacity per fiscal year:

- Does the offeror have the ability to produce X number of completed assets in FY15?
- How many months of lead time are needed before delivery of the first completed asset?
- **Performance**—Criteria are listed as yes-or-no questions and quantified as binaries, with one point for "Yes" and zero points for "No."
  - Does the offeror have the ability to store X number of completed assets?
  - Does this offeror have experience or past performance that is relevant to the program?

Then, PdM SKOT requests cost and additional data based upon the established matrix criteria and sub-criteria through a nonbinding sources-sought (SS) solicitation to industry and a request for information (RFI) to organic manufacturers. The SS and RFI require the offeror to submit cost data and answer questions derived from the PdM's sub-criteria. PdM SKOT uses the cost and questionnaire data in the analysis to differentiate offers, which helps provide the PdM with the appropriate justification for the final MoB decision.

To ensure fairness, the PdM provides offerors from both organic facilities and commercial industry with the same questionnaire and TDP, along with specific instruction on assumptions that may be made. Acquisition professionals instruct offerors to bid on a specific, low quantity for production to prevent offerors from claiming unreasonable cost savings or economies of scale. The SS or RFI is further structured to clearly define and restrict the way an offeror must bid, to allow for as direct a comparison between offerors as possible.

### WEIGHTED RESULTS

Before receiving SS and RFI data, the PdM weights the main cost, performance and schedule criteria in accordance with the needs of the program. (See Figure 2.) For example, the acquisition team may emphasize cost criteria heavily, although performance and schedule criteria are still included to measure and mitigate program risk.

Acquisition professionals then use data from the SS and RFI process to assess the MoB alternatives by employing the full analytical criteria method. This method is appropriate when there are few

alternatives from which to choose and/or few criteria to evaluate, and the stakes are high if the project fails.

The next step is to calculate cost criteria scores using the raw data. Obvious statistical outliers, which include bids that do not account for basic hardware costs or are more than twice the IGCE, are immediately removed from the analysis. Offers then are judged based on their relation to the IGCE and each other. The raw numbers are converted to percentages (percentage above and percentage below the IGCE baseline) and into whole numbers. Scores that are more than 25 percent above or below the baseline are considered risky and are penalized heavily in the final analysis.

The product team calculates performance and schedule criteria scores by totaling the quantified answers to the SS/RFI questionnaire, and translates scores into their RDVs for direct comparison to other offerors' scores in the final analysis.

Final offeror scores are calculated based upon the PdM's criteria weighting. (See Figure 3 on Page 105.) Raw data entered into the matrix automatically provide a recommendation for the program to either buy commercially or make organically. The PdM team reviews the process for accuracy and makes a formal recommendation to the Milestone Decision Authority (MDA) based on the matrix findings.

## CONCLUSION

This new process represents a positive, useful step in better understanding and leveraging the industrial base. In the past, we did not have a good process to consider using organic manufacturers, instead soliciting only commercial industry for work. This path routinely



## BASE SUPPORT

SPC David Ceballos, a welder and machinist with 201st Brigade Support Battalion, 3rd Brigade Combat Team, 1st Infantry Division (3-1 ID), welds a metal piece to a base plate at Forward Operating Base Apache, Afghanistan, Aug. 7, 2013. PdM SKOT manages metalworking, machining, cutting and welding devices among its broad portfolio of SKOTs. (U.S. Army photo by SGT Kandi Huggins, 3-1 ID)

provided—and often still provides—appropriate capability, competition and a successful program. However, it often left acquisition professionals unable to even consider organic options that take advantage of facilities already owned by DOD. Organic options can help to ensure a more ready workforce at each arsenal and depot as needed for specialized, surge or contingency production missions.

To date, multiple PdM SKOT new-start programs have been designated as “make” items under this process because of the ability to analyze competition better. Competition, after all, is the acquisition professional's greatest tool to drive best value.

PdM SKOT's new process enhances competition by improving the Army's ability to understand the broader

industrial base and compare its organic manufacturing facilities with commercial industry. Commercial sources will still often prove the more economical option, but today's acquisition professionals have a new tool to competitively seek the best value for our taxpayers and best capability for our Soldiers.

For more information, go to [www.peocscs.army.mil](http://www.peocscs.army.mil).

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# DOLLARS & \$ENSE

How the Army Acquisition Workforce is making  
Better Buying Power 2.0 work

*by Mr. Joseph M. Jefferson*

## **BBP 2.0 BASICS**

- 1. Achieve affordable programs.**
- 2. Control costs throughout the product life cycle.**
- 3. Incentivize productivity and innovation in industry and government.**
- 4. Eliminate unproductive processes and bureaucracy.**
- 5. Promote effective competition.**
- 6. Improve tradecraft in acquisition of services.**
- 7. Improve the professionalism of the total acquisition workforce.**

**For more information, go to  
<http://bbp.dau.mil/>.**

***B**etter Buying Power (BBP) 2.0 is as much about people and processes as it is about the bottom line. Bottom-line savings and cost avoidance are certainly the ultimate goals, but at the heart of BBP 2.0 is a cultural change. Indeed, the Hon. Frank Kendall, undersecretary of defense for acquisition, technology and logistics, said at his official rollout of BBP 2.0 in April 2013, “People, to me, are central to this.” Following are recent examples from Acquisition Workforce members not only of accomplishments in cost avoidance and savings, but also of changes they have made in how they do business to achieve the goals of BBP 2.0. At left are the seven focus areas of BBP 2.0.*

## **BRINGING CLARITY TO SHADOW**

For nearly a decade, the Army’s RQ-7B Shadow Tactical Unmanned Aircraft System (TUAS) has engaged in operations in Southwest Asia: Iraqi Freedom, Enduring Freedom and New Dawn.

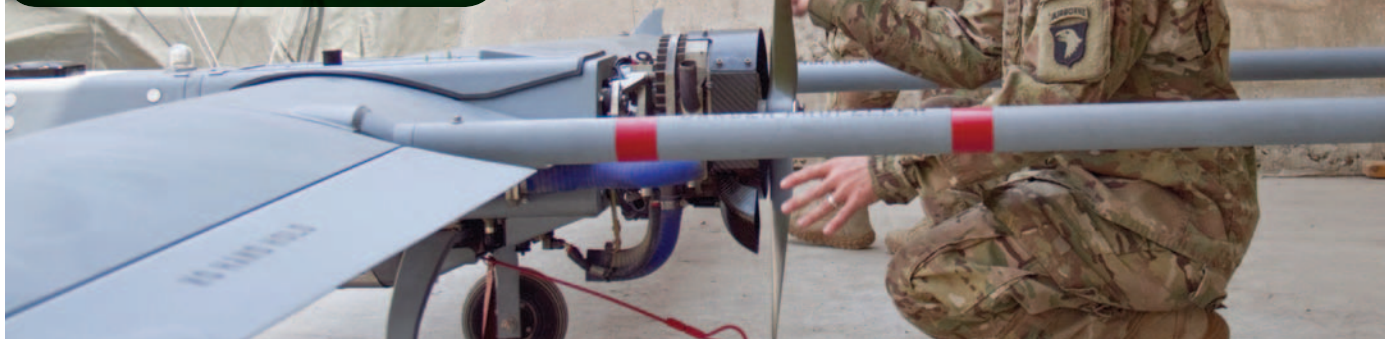
The program’s top priorities are support to the Soldier and system performance. The Shadow TUAS has flown in excess of 800,000 hours (90 percent in combat), with an operational availability consistently above 95 percent. One Soldier remarked, “Our unit did not conduct missions without Shadow in support.” Over the same period, the Shadow TUAS has undergone continual upgrades and modifications to improve endurance, payload capacity, reliability and overall capability.

With support to the Soldier remaining the top priority, Project Manager Unmanned Aircraft Systems (PM UAS) in Program Executive



**COMBAT-TESTED**

SGT Joshua D. Flynn, an unmanned aerial vehicle operator with the 4th Brigade Special Troops Battalion, 4th Brigade Combat Team, 101st Airborne Division (4-101 ABN), checks an AAI RQ-7 Shadow's propeller before takeoff at Forward Operating Base Salerno, Afghanistan, Aug. 27, 2013. The Shadow TUAS has flown in excess of 800,000 hours, 90 percent of that in combat. (U.S. Army photo by SGT Justin A. Moeller, 4-101 ABN)



Office (PEO) Aviation directed each PM UAS product office (PdO) in summer 2011 to develop strategies across all program areas to support DOD and Army cost reduction efforts and BBP guidance. The Ground Maneuver PdO implemented several initiatives, including:

- Establish a reset inspection process—The transitioning of reset maintenance to field-level maintenance accomplishes BBP guidance to target affordability and control cost growth. Previously, all Shadow systems were inducted for a complete reset, regardless of how long the deployment was, which cost nearly \$1 million per system. Field-level maintenance allows the unit to perform a system-level inspection, document discrepancies and make repairs based on agreed criteria. The unit continues to return items requiring major repair and/or depot-level modifications or upgrades to the original equipment manufacturer (OEM). This strategy is expected to reduce reset

costs by approximately two-thirds. It also minimizes downtime and maximizes operational availability. The strategy reduces the cost of a complete Soldier retraining, while promoting a rapid, tailored cycle of Soldier training to Readiness Level 1. In the first iteration of this initiative, with the Oregon National Guard in June 2012, Product Manager (PdM) Ground Maneuver reduced previously planned reset costs by nearly 90 percent. Soldiers are better able to repair on demand, promoting pride in ownership and increasing ready-to-fight time.

- Seek reliability improvements—This initiative, based on the BBP principle of incentivizing productivity, determined that upgrading Airborne Computing Equipment (ACE) II and II+ boxes to ACE III was significantly faster and cheaper than procuring entirely new ACE III boxes for the Tactical Common Data Link (TCDL). The PdM Ground Maneuver team developed an innovative and collaborative supply

chain management paradigm with the OEM. As a result, the production team upgraded existing ACE II+ boxes, which resulted in a cost savings of \$10.9 million. PdM Ground Maneuver is leveraging those savings to pursue other modernization efforts.

- Reduce the number of air vehicle (AV) part numbers—Ground Maneuver is targeting affordability and controlling cost growth, specifically eliminating redundancy within Soldier portfolios, by reducing the number of parts in stock and the various subsystem configurations. During the wars in Iraq and Afghanistan, the PdO made system improvements in response to Soldiers' requests for improved capabilities, which resulted in several configurations. One of these was the upgrade of the ACE II and ACE II+ boxes. The ACE III effort reduced part numbers from three to one, improving configuration control while providing a significant increase in platform processing power. Fewer configurations



### FEWER IS BETTER

PFC Ector Munoz, front, and SPC Matthew Williamson, UAS repairers assigned to 1st "Centurion" Brigade Special Troops Battalion, 1st "Ironhorse" Brigade Combat Team, 1st Cavalry Division (1-1 CAV), learn maintenance steps on a new extended-wing RQ-7B Shadow Aug. 22, 2013, at Fort Hood, TX. PdM Ground Maneuver has spearheaded a reduction in the number of system configurations, meaning fewer repair parts and less variation in training. (U.S. Army photo by PFC Paige Pendleton, 1-1 CAV)

also means fewer repair parts and less variation in the training required.

As a result of this initiative, the Shadow went from 13 different AV configurations to nine. The team's goal is to achieve three AV configurations within the next 24 months and, ultimately, a single AV configuration within six years. Furthermore, by moving to a fleet standard configuration and using ongoing engineering change proposals, the team expects to reduce: (a) the amount of rarely used test equipment; (b) the Soldier's logistic footprint; (c) the man-hour requirements to calibrate the test equipment; (d) logistics administrative time spent accounting for AV

configurations and spare parts; and (e) ownership costs.

- Incentivize productivity—The Ground Maneuver PdO has partnered with Shadow's OEM, AAI Corp., to restructure the production contract. The contract now increases incentives for successful system deliveries and reduces incentives associated with other progress milestones. This effort reduces the government's burden of making large progress payments based on non-material delivery milestones.

These efforts become even more critical with the transition to the TCDL. The advanced components associated with it may have higher procurement costs, but

the reliability improvements will significantly reduce sustainment costs—for example, through a smaller inventory of spare parts.

Over the past 10 years, UAS technology transformed the battlefield by shaping new doctrine and limiting Soldiers' exposure to the threat. However, many UAS capabilities were fielded rapidly with less regard for reliability and the impact of the logistic footprint. With combat operations winding down in Southwest Asia, there is a renewed emphasis on reducing costs without sacrificing performance.

*For more information, contact LTC Scott Anderson, PdM Ground Maneuver, at [joseph.s.anderson8.mil@mail.mil](mailto:joseph.s.anderson8.mil@mail.mil).*

### SMALL UAS, BIG SAVINGS

The Small Unmanned Aircraft Systems (SUAS) PdO, under PM UAS, seeks ways to reduce cost and gain the best return on investment in five ways, by: 1) consolidating buys and leveraging assets from other organizations; 2) pushing boundaries and seeking innovation; 3) moving away from sole-source or cost-plus-fixed-fee (CPFF) contracts to firm-fixed-price (FFP) contracts; 4) transitioning toward full and open competition; 5) keeping the organization lean; and 6) reviewing potential inefficiencies in policies and procedures.

As early as 2006, the SUAS PdO was pursuing BBP by making production rates economical and holding them stable. Consolidating system production buys with U.S. Special Operations Command, the U.S. Marine Corps, the Foreign Military Sales program and other Army buys drove down system costs, and all of the agencies benefited from the savings. Procuring Raven and Puma systems in a consolidated buy has distributed product management overhead costs over a larger purchase.



In line with the BBP focus on targeting affordability and controlling cost growth, the SUAS PdO also restructured the SUAS contractor logistics support (CLS) effort. The average annual sustainment cost over the previous four years was \$16,770 per Raven system. In 2010, the SUAS PdO implemented the Catalog Ordering Logistic Tracking System (COLTS) in the PdO, at field service representative sites in Operation Enduring Freedom (OEF) and at the prime contractor's facility. COLTS provides timely asset visibility of spare parts.

The data allowed the SUAS PdO to conduct a more stringent and informed technical evaluation during the contract award proposal process by purchasing only necessary spare parts. Data collected from COLTS also allowed the PdO to transition from a CPFF CLS contract to a less expensive FFP contract. In FFP contracts, the contractor is expected to assume more risk as the program matures into the sustainment phase of the acquisition life cycle. The SUAS sustainment effort also gave the PdO an opportunity to establish a government-operated inventory control point, which filled its first requisition in August 2012. These initiatives have saved an estimated \$9,358 per Raven system.

SUAS continues to pursue more savings by promoting effective competition. As the Honorable Heidi Shyu, assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)), stated in a PEO Aviation town hall meeting in August 2012, "Just the mention of competition to a contractor will cause them to lower their prices." The following two items drive home her point: With the award of a training contract in May 2011 through a full and open competition, the SUAS PdO realized a cost savings of more than



#### INVENTORY CONTROL

Jeff Wheeler, left, and Leon Moore, both with the company SES-I, work at the government-operated SUAS inventory control point (ICP), which filled its first requisition in August 2012. The ICP was one of the efficiencies established by the SUAS PdO. (Photo by Tim Sharp, PEO Aviation)

\$25,000 per SUAS operator training class. With more than 30 training classes conducted in a year, this resulted in \$750,000 saved. In addition, the SUAS PdO realized a \$10,000 savings in each Raven Gimbaled Payload, compared with the independent government estimate and the initial cost quote from the prime contractor. This cost savings of \$7.5 million in FY12 reflects the competitive award of the SUAS PdO's indefinite-delivery, indefinite-quantity contract in December 2012.

The lesson to be learned from this experience is not to be afraid to break away

from a successful process when circumstances create opportunity. It is easy to follow the same old routine without asking why. Embracing the BBP 2.0 focus on eliminating unproductive processes and bureaucracy, the SUAS PdO asked the Milestone Decision Authority for a waiver of the Earned Value Management System (EVMS) on both the Raven training and CLS contracts. EVMS was not the correct monitoring tool for these events, even though the policy stated that it must be used. The authority granted both waivers. This process, though difficult, saved the SUAS PdO at least \$450,000.



#### RAVEN SAVINGS

SFC Chris Loomis, senior instructor for the Warrior Leadership Course, 218th Leadership Regiment, South Carolina Army National Guard, launches a RQ-11B Raven for an instruction flight Nov. 21, 2013, at McCrady Training Center, Eastover, SC. Through a number of efficiencies, the SUAS PdO has saved an estimated \$9,358 in sustainment costs per Raven system. (Army National Guard photo by SGT Brian Calhoun, 108th Public Affairs Detachment)

Reflecting the BBP 2.0 focus on improving tradecraft in acquisition of services, the SUAS PdO used contractors other than the prime to provide subject-matter expert support in OEF and to build and field the VAMPIRE Institutional Training System. The resulted cost savings exceeded \$3.25 million.

The SUAS PdO is a small, lean, flexible team, which not only keeps overhead rates low but also enables the team to react quickly to changes and find solutions that work. The principles of BBP 2.0 have been, and will continue to be, business as usual in the PdO.

For more information, contact Mr. Max Mitchell, Deputy PdM SUAS, at [max.h.mitchell2.civ@mail.mil](mailto:max.h.mitchell2.civ@mail.mil).

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The "Dollars and Sense" feature in the October-December 2013 issue of Army AL&T magazine inadvertently omitted the names of the program managers who submitted the information on the cost savings/avoidances and efficiencies discussed in the article. The details of "Spinning Up Savings" came from LTC Brian Stehle, PdM for development and modernization in the Apache Helicopter Project Office of PEO Aviation, and Mr. Michael Horrocks, Assistant PdM for development and modernization. The specifics for "Black Hawk Up" came from COL Thomas H. Todd III, PEO Aviation's PM Utility Helicopters, and Mr. Craig S. Boehme, chief, Business Management Division in the Utility Helicopters Project Office.





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# Cushioning *the* **FALL**

PEO Ammo devises creative ways  
to preserve industrial base capabilities  
as materiel demand declines

*by Mr. Gary L. Barber and Mr. Rene Medina*

Over the past 10-plus years of war, the national technology and industrial base (NTIB) has grown to meet the demand for a multitude of energetics and munitions to support the theater requirements of combatant commanders. As a major provider of battlefield munitions across the joint services, the team of Project Manager (PM) Close Combat Systems (CCS), part of Program Executive Office Ammunition (PEO Ammo), successfully expanded several areas of the NTIB in support of operations, including aircraft pyrophoric countermeasure flares, which ignite in contact with air; grenades; detonation cord; and other combat enablers. These capabilities provide increased survivability and lethality to our aircraft and Soldiers.

Now, amid shrinking budgets and continuing sequestration cuts, the Army faces a significant downsizing after years of expansion to support and sustain combat in two theaters, and the acquisition community within PEO Ammo is reacting to these changing requirements and constrained resources. Team CCS is striving to inform strategic leaders of the shifting landscape and is adapting its procurement strategies to ensure the preservation of vital industrial base (IB) capabilities.

## A FLARE FOR INNOVATION

A1C David Vasquez of the 355th Security Forces Squadron fires a slap flare during a night combat tactics class Oct. 15, 2013, at Baumholder Airfield, Germany. Team CCS is a major provider of these and many other battlefield munitions across the joint services. (U.S. Air Force photo by A1C Jordan Castelan, 86th Airlift Wing)



### POWERFUL CAPABILITIES

U.S. Army PFC Isaiah Montalvo, left, receives instruction on how to properly prepare a C4 explosive from SGT Andrew Evatt at the Yakima Training Center, WA, April 10, 2013. Both Soldiers are assigned to the 14th Combat Engineer Battalion, 555th Engineer Brigade. Production of munitions such as this grew during Operations Iraqi Freedom and Enduring Freedom, and is now set to contract. (U.S. Army photo by SSG Antwaun Parrish, 5th Mobile Public Affairs Detachment)

Team CCS, along with other material developers in PEO Ammo, is conscious of the multitude of potential impacts on the NTIB. In response, it is assessing and executing procurement strategies to manage this contraction responsibly, to meet the needs of a budget-constrained force and keep the base warm.

Across the portfolio, Team CCS has been employing Better Buying Power (BBP) 2.0 management tools and competitive contracting strategies to address the needs of the Army while balancing and supporting critical IB sustainment. These efforts include promoting competition, more effective use of market surveys and awarding shorter-term contracts to create opportunities for companies to expand their

current portfolios and keep production lines going.

### FACILITY FLUCTUATIONS

After hostilities began in Afghanistan and Iraq, facilities and production lines were added to meet increased demand and to react rapidly to unanticipated conventional and hybrid threats. The NTIB expanded accordingly. Now, with the Iraq war over, operations in Afghanistan ramping down and the Budget Control Act resulting in decreased funding primarily through sequestration, many companies in the IB are contracting.

For example, at the start of 2003, there was only one facility supporting DOD in the production of aircraft pyrophoric countermeasure flares. As requirements

grew for all three services, PM CCS, along with the Navy and Air Force, worked with the supplier to increase capacity to meet DOD needs. The supplier grew from one facility to three to support the requirements for aircraft pyrophoric material countermeasures. As budgets have shrunk over the past several years, the contractor has right-sized itself to adapt to the lower demand. (See Figure 1 on Page 118.)

While many companies within the IB are right-sizing their workforces and production lines to meet the lower demand, Team CCS continues to assess risks, balance resources and make decisions to sustain production for critical strategic capabilities. In spite of these efforts, the reality is that, as the force becomes leaner, the team's equitable decisions to keep the base warm with fewer resources may not be enough to sustain all of them.

### GROUPING FOR MAXIMUM BENEFIT

Part of Team CCS's core acquisition strategies that help shape the IB is to combine family-of-capability purchases, or "family buys," grouping multiple items together to help maintain minimum sustainment rates for many of the items. Team CCS has employed this strategy successfully with the continuing acquisition of handheld signal flares. This family-buy approach allows the manufacturer to keep leaner staffs and production lines going at a steady rate without interruptions.

For example, a family buy pooled six handheld signals (M125A1, M126A1, M127A1, M158, M159 and M195) on one contract, allowing Team CCS to have sufficient quantities on contract to meet the manufacturer's minimum sustainment rates, rather than having them produced all at once. This vehicle also





#### DOWNWARD TREND

An Army CH-47 Chinook, equipped with the Common Missile Warning System and Advanced Threat Infrared Countermeasure suite of countermeasures, expends flares during recent flight tests. Aircraft pyrophoric countermeasure flares are among the areas of the NTIB that Team CCS has expanded to provide increased survivability and lethality to aircraft and Soldiers. Now the focus has shifted to adapting procurement strategies to shrinking demand as overseas operations draw down. (U.S. Army photo)

allows the Army to buy particular handheld signals in alternating years. Thus, the Army is not required to make buys to add to existing inventory, and there are still sufficient quantities for the manufacturer to meet its production needs. In situations where multiple items are on the same production line, Team CCS is investigating alternating yearly buys of various handheld signals. This would allow it to help manage inventory levels, put funding where it is most needed and maintain continuous production.

Additionally, Team CCS is considering employing an acquisition contract strategy that combines multiple aircraft pyrophoric countermeasures. This would

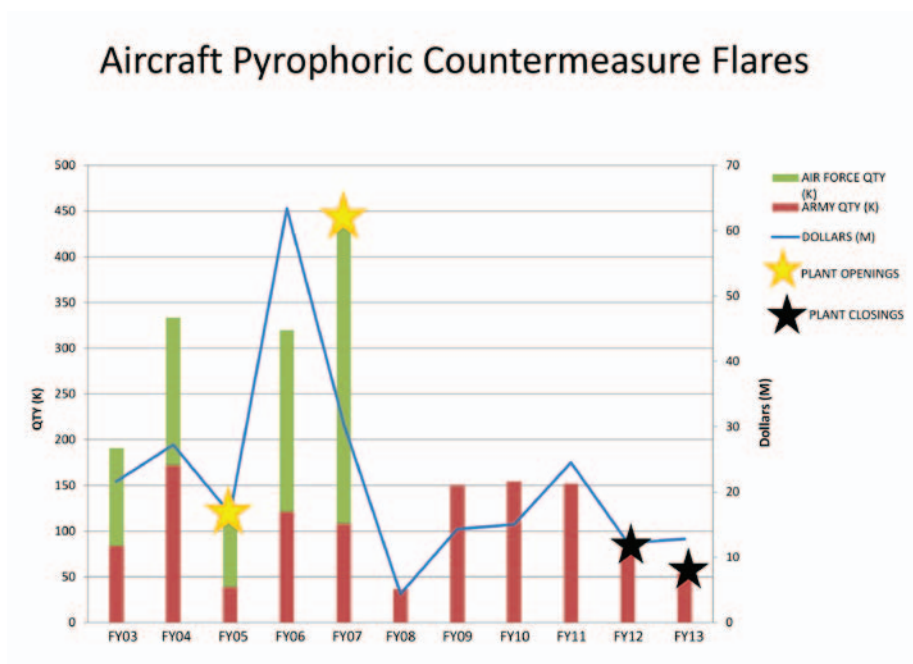
create a contractual vehicle that not only maximizes the ability to obtain more economical buys for the Army and Air Force, but also creates better volume for the contractor to set up its production line and retain core line workers.

Team CCS is also considering the possible efficiencies in combining procurements of similar grenade fuzes, including those bought separately and those bought under grenade system contracts. One critical aspect of such an approach is to consider the impact on competition. Historically, fuzes and grenades were bought separately as the most efficient procurement strategy. To understand IB sensitivities, growth opportunities and

risk areas, Team CCS conducted multifaceted market research to reassess this approach. As a result, the team discovered that, given the similarities among the fuzes for different types of grenades, these items could be combined under the same contract vehicle with the objective of maintaining competitive hardware unit pricing for small buys of fuzes.

Solicitation packages developed by the production engineers can also be streamlined, thereby reducing the support otherwise needed for duplicate packages, as well as reducing the labor needed to evaluate multiple, separate proposals and provide contract oversight. These market surveys, periodic meetings, and advanced

FIGURE 1



### CHANGING TIMES

At the start of 2003, only one facility supported the production of aircraft pyrophoric countermeasure flares. As requirements increased for all three services, the supplier expanded from one facility to three. As requirements have decreased, the contractor has right-sized itself to adapt to the lower demand, closing two facilities. (SOURCE: PM CCS)

planning briefs to industry and symposia helped our team refine acquisition strategies to reduce program costs while ensuring a viable, competitive environment.

### COMPETITIVE CONTRACTING

Team CCS found another effective use of market surveys by looking into the CCS-managed detonation cord, used as a detonating agent, a priming agent or alone as an explosive charge. In the past, with only one known source capable of manufacturing detonation cords, our team supported a family buy of five detonating cords. Re-examining this approach for an FY13 solicitation, our team conducted in-depth market research that included telephonic interviews with commercial detonating cord

manufacturers and suppliers regarding procurement of the cord.

This new research indicated additional interest in producing the detonating cords. However, as in the past, only one producer met the NTIB restriction for pentaerythritol tetranitrate (PETN), a highly explosive organic compound at the core of detonation cords. The research also showed that the producer of this explosive had a supplier agreement to sell only military-grade PETN to one manufacturer, which limited competition within the NTIB. The needed quantities of military-grade PETN are very small, and not restricting it to the NTIB would pose no harm to the producer. Therefore, Team CCS decided that PETN would not be restricted to the

NTIB. This allowed potential vendors of detonating cord to buy PETN from off-shore suppliers and thus expanded the potential number of manufacturers for detonating cord in the NTIB.

Additionally, Team CCS broke out the family buy of five detonating cords, since one of the cords could still be produced only by a specific manufacturer. Two contracts were awarded—one competitive, three-year contract within the NTIB, and one sole-source contract for a shorter duration. The shorter, two-year contract provides repeated opportunities for manufacturers to re-compete in the near term and increases the likelihood that there will be a sustained IB to support detonating cord requirements in the future.

### NURTURING THE BASE

A primary tool for Team CCS to manage our munitions IB responsibly is the Section 806 process. Section 806 of the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 permits the Army to restrict procurement actions to less than full and open competition as a way to protect the North American munitions IB. This allows the Single Manager for Conventional Ammunition within DOD to limit actions to sources within the NTIB. This law helps preserve those unique capabilities and suppliers in the NTIB that are considered critical to producing conventional ammunition. Team CCS and PEO Ammo use Section 806 to ensure that acquisitions stay within the NTIB for items that are at risk of being lost without government intervention. (See related article on Page 120.)

In our acquisition strategies, our team works to identify potential sources of single-point failure (SPF) where an end item or subcomponent has only one





#### SPARK OF EFFICIENCY

1LT Charles Morgan, with the 6th Squadron, 4th Cavalry Regiment (6-4 CAV), 3rd Brigade Combat Team, 1st Infantry Division, throws an M67 fragmentation grenade during skills training in Kunduz province, Afghanistan, July 3, 2013. Team CCS is exploring potential efficiencies in combining procurements of similar grenade fuzes. (U.S. Army photo by SGT Robert Avila, 6-4 CAV)

qualified producer available, and to ascertain vulnerable second- and third-tier suppliers that need to be protected. Funding is then prioritized for items in those important areas whenever possible. Section 806 is also used to ensure that acquisitions stay within the NTIB for those items on the SPF list. These efforts sustain important strategic supplies and capabilities for the security of our nation.

#### CONCLUSION

Team CCS is working with its industrial partners to maintain important capabilities and adequate capacity in the NTIB, using some of the tenets of BPP 2.0. The team does this through a number of strategies including leveraging economies of scale, promoting competition and using Section 806 policies to sustain the health of key industrial capabilities. The approaches cited in this article

are examples of procurement strategies to responsibly manage the impact of reduced budgets on the IB. How the base survives also depends on how adaptive our industry partners are.

Team CCS will continue to assess risks across the NTIB. It will explore and use both proven and innovative strategies that help to mitigate the impacts of constrained resources and maintain strategic technologies in the NTIB that improve the lethality and survivability of our operational forces.

For more information about PM CCS, go to <http://www.pica.army.mil/pmccs/Default.html>.

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# Section 806 Process: Ensuring a Viable National Technology and Industrial Base

*by Mr. Craig Francisco*

**A**s the 20th century approached its terminus, a new national defense dilemma faced the U.S. government: Globalization of markets opened new avenues for competition between foreign and domestic suppliers. While encouraging competition both within and between borders, the government was also cognizant of the need to maintain a core capability of munitions manufacturing on the domestic front in case of national emergencies.

With continued instability in the Middle East and recent geopolitical events elsewhere, the concern about protecting domestic capabilities has only increased. Section 806 of Public Law 105-261, the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, provides the Single Manager for Conventional Ammunition (SMCA) within DOD the “authority to restrict the procurement of conventional ammunition to sources within the national technology and industrial base” (NTIB) in accordance with Title X, U.S. Code, Section 2304(c). Those sources include suppliers in both the United States and Canada.

Program Executive Office Ammunition (PEO Ammo) executes this mission on behalf of the assistant secretary of the Army for acquisition, logistics and technology.

Section 806 established a process to assess the risk that a procurement of conventional ammunition poses to the NTIB’s ability to respond in the event of a national emergency. As required by Defense Federal Acquisition Regulation Supplement Subpart 207.103(h), any acquisition plan for the procurement of conventional ammunition must be submitted to the SMCA for review to determine if the procurement is consistent with retaining NTIB capabilities in accordance with 10 U.S. Code, Section 2304(c)(3) and Section 806 of Public Law 105-261. Thus, by law, acquisition cannot proceed until the SMCA has provided written concurrence.

Under the Section 806 process, the DOD acquisition manager of the munition under review gathers and submits data including value, time frame, procurement approach





### STEADY SUPPLY

The U.S. government is aware of the need to maintain a core manufacturing capability for munitions, such as this 7.62 mm magazine, on the domestic front in case of national emergencies. Accordingly, Section 806 of Public Law 105-261 gives DOD the authority to restrict the procurement of conventional ammunition to sources within NTIB. (Photo by SSG Danielle M. Bacon)

and quantities. From the data submitted, PEO Ammo generates an industrial base (IB) assessment. This assessment focuses on existing NTIB capabilities required to produce the conventional ammunition items of the subject acquisition as well as required sub-tier components and respective suppliers.

### THE 806 WATCH LIST

PEO Ammo uses certain tools to assist in the 806 process, one of which is the SMCA Conventional Ammunition End Item/Component at Risk List (806 Watch List). Updated periodically to ensure relevance, the list contains end items, components and capabilities that are essential to supply military ammunition in cases of national emergency or to achieve industrial mobilization that, depending on the magnitude of the procurement, could be at risk of being lost in the NTIB without government intervention.

However, items that are on the watch list are not automatically restricted to the NTIB. Conversely, items not on the watch list can be restricted if determined necessary. Factors used in developing the list include:

- Unique-to-defense factors (facility, technology, skills, etc.).
- Number of qualified NTIB suppliers.
- Cost and time to replace.

### WINDOW ON AMMO

PEO Ammo develops a more complete picture of the overall condition of the ammunition IB by gathering information provided by ammunition acquisition managers, and by using the watch list and IB assessments. The 806 process has enabled PEO Ammo to identify potential risk areas, allowing for the development of acquisition strategies that are in line with maintaining and sustaining industrial capabilities when necessary.

### BUCKS FOR THE BANG

Soldiers from 4th Battalion, 320th Field Artillery Regiment, 4th Brigade Combat Team, 101st Airborne Division (Air Assault) conduct a fire mission with the M119A 105 mm Howitzer on Camp Wilderness, Afghanistan, Sept. 6, 2013. By law, any acquisition plan for the procurement of conventional ammunition must be submitted to the SMCA for review to determine if the procurement is consistent with retaining NTIB capabilities. (U.S. Army photo by SPC Charles M. Willingham, Combat Camera Afghanistan)



The 806 process also serves as a vehicle for the services to share information on the ammunition IB. Defense companies often have highly diversified munitions portfolios and supply munitions to multiple services. When decisions are made for one program, those changes may impact other programs.

With the 806 process as a vehicle, shared knowledge about the ammunition IB enables ammunition project management offices to build more effective acquisition plans that avoid unintended consequences and other potential

roadblocks. Understanding shared supply chains is vital to maintaining an IB that meets warfighter requirements, while ensuring the effective use of taxpayer dollars.

Even though the 806 process has helped provide insight into the condition of the ammunition IB and has helped to sustain it, there still are areas that need improvement. Currently, confusion exists in the definition of “conventional ammunition.” According to Section 806, the term has the same meaning as in DOD Directive 5160.65, which

contains a definition and general list of what is considered conventional ammunition. Based on this language, interpretations vary as to whether certain items warrant inclusion in the 806 process, resulting in a lack of acquisition plan submissions to PEO Ammo from certain ammunition programs.

This inevitably leads to gaps in information, and in turn to instances of not knowing the true state of a particular sector of the ammunition IB. As more parties participate, the true value of the Section 806 process will be realized.





#### BATTLESIGHT ZERO

Marines with 3rd Battalion, 7th Marine Regiment fire at targets to acquire their battlesight zero on Camp Leatherneck, Afghanistan, Dec. 5, 2013. The Section 806 process allows the services to share information about the ammunition IB, such as decisions being made in one ammunition program that could affect other programs. (U.S. Marine Corps photo by Cpl John Clary, Regional Command Southwest)

PEO Ammo's objective is 100 percent participation from all programs involved with the procurement of conventional ammunition. Until there is 100 percent compliance with Section 806 of Public Law 105-261, there will continue to be uncertainty in certain sectors of the ammunition IB.

*For more information on Section 806, go to <http://www.gpo.gov/fdsys/pkg/PLAW-105publ261/html/PLAW-105publ261.htm>.*

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# Retooling **ARMS**

Armament Retooling and Manufacturing Support program  
adapts to better sustain the industrial base

*by Mr. Larry Franz*



## **DRIVING PRODUCTIVITY**

Hawthorne Army Depot, NV, established in 1930, is one of seven GOCO facilities in the Army's ammunition organic industrial base and the biggest of the munitions storage depots. The ARMS program helps to sustain GOCO facilities such as Hawthorne, which have capabilities and acreage that are marketable for commercial use. (Photo courtesy of PD JS)



An increasingly difficult challenge for the Army, amid troop withdrawal and declining ammunition requirements, is the sustainment of its government-owned, contractor-operated (GOCO) industrial base. With World War II-era facilities and expansive acreage, the Army is in a continuous struggle to enable these facilities to provide high-quality, cost-effective products while preserving strategic, though often “wrong-sized,” production capabilities. Lower production requirements have taken their toll on local economies through job losses, with skilled labor seeking employment elsewhere.

To help address these issues, Congress established the Armament Retooling and Manufacturing Support (ARMS) program in the ARMS Act of 1992. While the official charter includes numerous objectives, the program’s general purpose is simple: Provide a mechanism for commercial business to use (rent) the eligible buildings and assets on GOCO facilities. In turn, that would help preserve capabilities and boost local economies by creating or retaining skilled jobs.

Since its inception, the ARMS program, which operates at all GOCOs, has succeeded in achieving its mission, which also includes reducing the cost of manufacturing government products at each facility. At the same time, however, program performance has stalled due to the current economic environment and a continuing decline in ammunition requirements. Consider the following figures from FY11-12, a time when program funding nearly doubled, from roughly \$1 million to nearly \$2.1 million:

- FY12 saw an increase to 58 tenants—just two more than in FY11. Tenant rent revenue dropped about 1.5 percent, to approximately \$3.7 million.



#### PUBLIC-PRIVATE PARTNERSHIP

Joe Schilling, American Ordnance LLC’s line director at IAAAP, talks with BG John J. McGuiness, Program Executive Officer Ammunition, about a 40 mm round. McGuiness and COL Scott Turner, left, then PEO Ammo’s Project Manager Combat Ammunition Systems, were touring the plant on Jan. 17, 2013. IAAAP is one of two pilots for the ARMS pre-certification initiative, which aims to make GOCO facilities more competitive in the marketplace. (Photo by Darryl Howlett, U.S. Army Materiel Command)

- Overall “savings” achieved from items such as rent, in-kind services and overhead absorption dropped dramatically, from approximately \$25 million to \$10 million.
- The average annual rate of return on assets was an impressive 9 percent from inception to FY11, but performance in FY12 dropped to just 3.13 percent—still on par with or better than commercial industry, but a significant drop for the ARMS program.

While a variety of factors contributed to the above figures, there clearly were changing socioeconomic factors that meant that the ARMS program, too, had to change. Accomplishing this was a task for the Project Director Joint Services (PD JS), within Program Executive Office Ammunition (PEO Ammo).

No longer could the Army afford the status quo. The ARMS program needed to be reconfigured in a fundamental manner that would allow it to move at “the speed of business” and get back on track.

The result was a two-pronged initiative to transform the ARMS business model:

- Restructure the operator compensation model to increase benefit to the facilities.
- Better position the facilities to compete for commercial tenants in the marketplace.

#### OPERATOR COMPENSATION MODEL

In assessing the existing model, the Army had two concerns. First, there was clearly a disconnect between the tax dollars

being invested in the program and the declines in both rent revenue and the overall “savings.” Second, while some of the rent was used to support investment in the facilities, much of it was being used to directly offset the program administrative and marketing costs, offering little in the form of a recurring benefit to the facility or improved marketability of the site.

The ARMS team evaluated commercial best practices and developed a dynamic business model that was applicable to the uniqueness of the program. The answer was simple: Transition the program to an incentive-based compensation model.

Under this new model, operating contractors at each GOCO receive a percentage of the rental receipts in lieu of guaranteed marketing payments to them that historically have come from appropriated funds. This allows the Army to redirect the would-be marketing funds, along with the government’s share of rental receipts, to additional facility modernization projects, such as infrastructure upgrades, facility and equipment modernization.

Such investments have a compounded benefit for sustainability through permanent cost reductions realized year over year. The new compensation model is also more closely aligned with commercial best practices and the real estate marketing industry standard of “pay for performance,” awarded on a percentage basis. For the operating contractors, the new ARMS business model has no compensation ceiling, so they have more incentive to attract high-quality tenants. Likewise, the reduction in operating and production costs means the operating contractor is better positioned to compete for commercial ammunition business, thus expanding the base over



### NEW LOGO, NEW STRATEGY

Since its inception, the ARMS program, which operates at all GOCOs, has succeeded in reducing the cost of manufacturing government products at each facility by maximizing the facilities’ use. Now the program is undergoing fundamental changes to improve the facilities’ productivity at a time of fiscal constraints and a continuing decline in ammunition requirements. (Image courtesy of PD JS)

which to absorb overhead and improving the facilities’ sustainability even further.

Operator support requirements for the ARMS program are dictated by the respective length of the facility-use contracts in place at each GOCO. Therefore, rollout of the new compensation model is taking place incrementally, as current contracts expire and the opportunity arises for contractual negotiations. That said, the model to date has been well-received by the operators and is either in place or in the final phases of implementation at nearly all of the active GOCOs.

### POSITIONING TO COMPETE

To make the facilities more competitive in the marketplace, the Army pursued a prevailing commercial trend: site precertification, which is designed to complete much of the site documentation and analysis that typically are completed during a prospective tenant’s due diligence process. This approach offers several benefits:

- The cycle time for tenant acquisition and due diligence is reduced by six months or more, compared with current non-precertified sites.
- Precertified sites represent a lower risk for prospective tenants.
- An inventory of prequalified land and

facilities is available to prospective tenants, along with substantiating data and analysis.

- Precertified sites are marketed not only by the local facility operator, but also by state and local economic development agencies.

Precertification of a site is a fairly extensive process that begins with the development of certification criteria by a state-designated third party site selection consultant and/or engineering firm. These criteria ensure that the site has attributes and conditions that will allow it to meet the expected demands of current and future commercial development opportunities, such as property titles and permits; availability and capacity of utilities and logistics infrastructure; and floodplain and environmental assessments. The availability and specific requirements for certification vary from state to state. State economic development agencies can provide more information on precertification.

### PILOTING THE TRANSITION

The Iowa Army Ammunition Plant (IAAAP) in Middletown, IA, and Milan Army Ammunition Plant (MLAAP) in Milan, TN, were chosen as pilots for this ARMS initiative. Successful execution of these pilots required the integrated



efforts of a team led by Deborah Hookway, the current manager of the ARMS program. The team included the two facilities' operator (American Ordnance LLC), local government staff, the ARMS teams of both PEO Ammo and Joint Munitions Command, economic development staffs from the states of Iowa and Tennessee, regional economic development staffs, certification consultants and major utility companies.

The Graball Site at the Milan Commercial Complex of MLAAP received official certification on Sept. 23, 2013. The documentation process took approximately nine months to complete.



"This is a true win-win for all involved," said COL Steven Cummings, PD JS. "In addition to standardizing the approach for assessing and documenting the availability and development potential of the facilities, the Army has been able to significantly reduce its cycle time while enhancing the [ARMS] program's ability to achieve its mission."

The second pilot site, with approximately 900 acres—the Burlington "Super Park" at IAAAP—is entering the final stages of precertification. The Super Park, so designated because it encompasses more than 750 acres, will represent the largest such site in Iowa. Additional GOCOs are currently under consideration for precertification to begin in 2014, including Holston AAP, TN, and Lake City AAP, MO.

## CONCLUSION

One final element of the business model transformation is worth noting, as it has turned out to be a major barrier to the acquisition of larger prospective ARMS tenants: recognition of the need to extend the maximum lease duration, which is currently capped at 25 years. Larger

## ADAPTIVE LANDSCAPE

Holston AAP, TN, is currently under consideration for site precertification to begin in 2014. Precertification, a commercial trend, is designed to complete much of the site documentation and analysis that typically take place during a prospective tenant's due diligence process. (Photo courtesy of PD JS)

companies typically require lease terms of 50 years or longer, which are more available in the commercial sector, to justify capital investments and establish a longer-term business strategy. A combination of congressional directive and Army policy is required to make this change in the ARMS program; this effort is ongoing.

One might say that the jury is still out on the impact of the new ARMS business model, given that it is not expected to show up in performance data for at least two to three years. However, all of the initiatives have been proven commercially and are expected to yield significant improvements in the ARMS program over the coming years, benefiting both the sustainability of the GOCO facilities and the surrounding economies.

For more information on the ARMS program, contact Deborah Hookway of PD JS

at [deborah.a.hookway.civ@mail.mil](mailto:deborah.a.hookway.civ@mail.mil); or go to <http://www.openterprise.com/>.

MR. LARRY FRANZ is a business management analyst with PEO Ammo, Picatinny Arsenal, NJ. He holds a B.S. in economics and a B.A. in business management from East Stroudsburg University, an M.S. in contracting and acquisition management from the Florida Institute of Technology, and a master's in management and organizational leadership from Webster University. Franz is Level III certified in both acquisition and program management. He recently completed the Senior Service College Fellowship program, equivalent to the Military Equivalent Level I certification. Franz is a member of the U.S. Army Acquisition Corps and the Omicron Delta Epsilon Honor Society/Economics.

## COMMENTARY

FROM THE DIRECTOR,  
ACQUISITION CAREER MANAGEMENT  
LTG WILLIAM N. PHILLIPS

# FROM THOUGHT TO ACTION

Careful assessment is the first, but not the only, step toward supporting stability for the industrial base

Since the 1950s, our defense industrial base has provided the United States with a long-term strategic advantage. Our ability to equip our military with everything from tanks to world-class weapons to aviation systems, cheaply enough to employ them in large numbers, has enabled the nation to maintain its preeminent role as the world's only superpower.

However, we recognize that as times and technologies have changed, so has what constitutes the "industrial base." "It is important to recognize that over the last 20 years, the industrial base upon which we rely has steadily become more global and diverse," according to the October 2013 "Annual Industrial Capabilities Report to Congress" from the Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy.

Far from the monolithic structure of the past, today's defense industrial base is extremely diverse, including companies that provide products and services, directly and indirectly. They range from some of the biggest





**MULTIYEAR SUSTAINMENT**

PFC Bryan Herradura, a signal support systems specialist assigned to 70th Brigade Support Battalion, 210th Fires Brigade, 2nd Infantry Division, communicates with a UH-60 Black Hawk helicopter during sling-load training Nov. 22, 2013, on Camp Mobile, South Korea. Multiyear purchasing of helicopters—buying fewer each year for a longer period of time—is one way to help sustain the industrial base. (U.S. Army photo by SSG Carlos R. Davis, 210th Fires Brigade Public Affairs)





#### SUPPORTING ELECTRONICS

Matt Check, electronics technician at Tobyhanna Army Depot (TYAD), PA, sets up the Schleuniger Crimp Center to mark and strip wires for the Common Remotely Operated Weapon Station identification box. TYAD is DOD's largest center for the repair, overhaul and fabrication of a wide variety of electronics systems and components. (Photo by Steve Grzedzinski, TYAD)

public companies in the world to sole proprietorships to garage startups.

As I have testified to Congress, it is critical that the Army be concerned about the likely long-term impacts of our current fiscal environment on the industrial base. Specifically, we must better understand impacts from the potential loss of critical skill sets or suppliers at all tiers, and an increase in the number of single-point failures in the supply chain. These impacts affect both commercial and Army organic industrial base operations.

The defense industrial base responds to significant reductions in military missions by reducing excess capacity and streamlining processes. These changes may have negative impacts on certain suppliers within the supply chain. If so, DOD has policies, processes and structured procedures in place to make appropriate judgments about identified issues. In some cases, we can integrate those judgments into our regular budget, acquisition and logistics decisions.

The Army takes many factors into consideration when making investment decisions, including present and future requirements, current and expected budget realities, and the health and sustainment of critical suppliers in the industrial base. While each case is unique, we use several mitigation strategies to offset negative effects on critical suppliers. Foreign military sales (FMS), multiyear contracts and helping suppliers expand into the commercial sector are all examples of techniques to help sustain the industrial base. (See related articles on Pages 32 and 36.)

The Army is aggressively evaluating how best to identify and preserve critical industrial base capabilities. We are working to understand the impacts of



**TODAY'S DEFENSE INDUSTRIAL BASE IS EXTREMELY DIVERSE, INCLUDING COMPANIES THAT PROVIDE PRODUCTS AND SERVICES, DIRECTLY AND INDIRECTLY. THEY RANGE FROM SOME OF THE BIGGEST PUBLIC COMPANIES IN THE WORLD TO SOLE PROPRIETORSHIPS TO GARAGE STARTUPS.**

lower production volume on the base as a whole and on the critical sub-tier suppliers on whom we rely for spares and repair capability.

Defense leaders are postured for the full impact of sequester cuts—potentially \$52 billion in defense spending reductions this fiscal year. With the health and viability of the industrial base uppermost in our minds, it will take more than assessments, FMS and contracting vehicles to preserve the base and ensure that those businesses from which the Army buys equipment don't have to close their doors.

What's essential for every sector is a comprehensive plan for continued modernization with stable funding to meet ongoing commitments and address new challenges. Most importantly, we need "predictability" in budgets. A stable, robust and predictable funding level is an important factor in sustaining industrial capabilities. It is precisely how we must plan and, to the extent possible, preserve our critical defense industrial base.



#### MOVING 'EM OUT

Crates of 60 mm mortar systems are ready for sealing and shipping from Watervliet Arsenal, NY, to the Afghan National Army in September 2013. The arsenal completed the FMS shipment of 900, 60 mm mortar systems on an accelerated schedule in less than eight months, in support of President Obama's deadline for the drawdown of troops from Afghanistan. (Photo by John B. Snyder)



A photograph of LTG Thomas P. Bostick, a Black man in a dark blue military uniform, signing a document with a blue pen. He is seated at a table with a red cloth. His uniform features a name tag that reads "BOSTICK", a "U.S." insignia, and several rows of colorful service ribbons. In the background, two young students, a boy in a light blue shirt and a girl in a purple shirt, are looking on. The scene is set indoors with flags visible in the background.

### SIGNING UP FOR STEM

LTG Thomas P. Bostick, USACE commanding general, signs a memorandum of understanding with DoDEA during a ceremony May 20, 2013, at W.W. Ashurst Elementary School in Quantico, VA. The understanding leverages the strengths of both organizations to advance STEM education in communities where DoDEA and USACE activities are both located. (Photo courtesy of DoDEA)



FROM THE COMMANDER,  
U.S. ARMY CORPS OF ENGINEERS  
LTG THOMAS P. BOSTICK

# STEM Strategy



Fortifying science, technology, engineering and mathematics skills in current and future workforce is critical to battlefield success

The United States once led the world in the percentage of undergraduate college students with science, technology, engineering and mathematics (STEM) degrees. Today, it ranks among the lowest, according to the National Science Foundation. This national challenge has tremendous implications for the U.S. military because of the rapidly increasing importance of STEM in maintaining a strong economy and providing national security. Our military's ability to prevail on the battlefield and respond to advances in technology depends on a diverse, dedicated and competent team of professionals, which must include those with a STEM background.

At the U.S. Army Corps of Engineers (USACE), we have a highly skilled and dedicated team innovating and developing solutions for some of the nation's toughest challenges. Though the impending retirement of baby boomers and the loss of their institutional knowledge remain at issue, the lack of a diverse STEM workforce

at USACE and across the nation is also of great concern.

Crucial segments of the U.S. population are underrepresented in the nation's STEM technical workforce, and thus the Army's workforce. Women and minorities represent more than half of the U.S. population but constitute 23 percent and 6 percent of STEM occupations, respectively, according to the latest National Science Foundation statistics.

The nation struggles with getting young people interested in STEM careers while they are in elementary and middle school, and with maintaining their interest in college. Women account for only 10 out of every 100 STEM undergraduate degrees; African Americans and Latinos account for five out of every 100 STEM undergraduate degrees.

We need more diversity in our organization—not just in gender and ethnicity, but in educational



#### DIRECT INVOLVEMENT

During a visit to Patch High School in Stuttgart, Germany, Bostick works with an advanced placement biology student in the school's lab. (USACE photo by Brian Temple)

background, technical expertise and personal experience as well. Varied backgrounds and experiences bring inherently different perspectives and outlooks, which are vital to achieving innovative and enduring solutions to complex problems.

An important part of ensuring that we maintain the great technical advantage our Army enjoys is to continue developing a pipeline of talent that includes STEM. We have an obligation to build our STEM talent pool and inspire the next-generation workforce to consider the Army as an employer based on the challenging and rewarding work we do. Through our recruitment, retention and development efforts, we can effect change and succeed at this goal.

#### RECRUITING

USACE has a long history of providing expertise and demonstrating the agency's value around the world. We have more than 35,000 civilians and 700 military personnel developing solutions to address complex issues such as sea level rise, climate change, force protection and renewable energy.

Our Soldiers have continued to answer the call to duty in repeated combat deployments. Many of our civilians have also deployed into harm's way. In the 12 years since 9/11, there have been more than 30,000 civilian deployments in support of overseas contingency operations in Iraq, Afghanistan and other nations. We're very proud that USACE civilians represented 11,000 of those deployments.

Additionally, thousands of USACE civilians deploy each year in support of disaster response operations, both at home and abroad, including Hurricanes Isaac and Sandy.

The USACE civilians who have deployed, along with those supporting the combat effort from USACE locations across America and overseas, represent a variety of STEM occupations, including architecture, accounting, engineering and geographic information systems. They are our recruiters and ambassadors for USACE, telling stories about challenging projects and exciting opportunities. They act as mentors to college students through our formal partnerships with institutions including historically black colleges and universities, minority-serving





### SCOUTING FOR STEM

Boy Scouts explore potential career paths in STEM July 22, 2013, during the annual Coastal Empire Council Boy Scouts of America Summerfest in Savannah, GA. The USACE Savannah District staffed an exhibit of wetlands functions at the event, which involved 275 Scouts representing seven states. (USACE photo by George Jumara)

institutions and ROTC. They are introducing students to STEM fields through internships at our districts, divisions and the U.S. Army Engineer, Research and Development Center. (See related article on Page 76.)

Last year, we decided to take a more direct approach to addressing the Army's STEM challenge. In May 2013, we established a one-of-a-kind partnership with the Department of Defense Education Activity (DoDEA), which provides pre-K through 12th-grade education to the children of military families around the world. The partnership resulted in a USACE-specific STEM outreach program, STEM ED, which advances

STEM education in communities where DoDEA and USACE activities are co-located. In addition, the DoDEA-funded effort benefits military families by leveraging the expertise and capabilities of USACE volunteers to engage students in real-world connections between the curriculum and the work of the STEM professionals.

STEM ED is a unique program of rigor that adds engineering design concepts to the curriculum, and provides integrated conceptual understanding and long-term interaction with students. Students work with a minimum of two USACE volunteers—military and civilian engineers and scientists—to explore a

STEM project with the concept to build strong structures that withstand forces of nature. The USACE professionals are in middle school classrooms one to two hours per week for approximately six weeks, addressing challenges that relate to the USACE mission and align with the DoDEA curriculum.

We are maximizing our STEM awareness efforts by working with a diverse DoDEA student population which, at an impressive rate of 79 percent, has indicated plans to pursue undergraduate education. We want the students excited about STEM; we hope to encourage them to choose a career in STEM and, eventually, to serve the nation in this important field.

**WE ALSO OFFER THE OPPORTUNITY TO WORK ON COMPELLING PROJECTS AND TECHNOLOGIES THAT ARE MAKING A DIFFERENCE IN PEOPLE'S LIVES, ... SUCH AS PROVIDING WATER RESOURCES ASSISTANCE TO COUNTRIES IN NEED, RESEARCHING CARBON NANOTUBE-BASED MATERIALS AND IDENTIFYING THEIR USES FOR WARFIGHTERS, AND BUILDING AND RESTORING HABITATS FOR ENDANGERED SPECIES.**

STEM ED is our second collaboration with DoDEA, the first being the development of several new, 21st-century schools built with an infrastructure that can adapt and respond to emerging requirements. These include schools at Fort Buchanan in Puerto Rico, West Point Middle School at the United States Military Academy at West Point, NY, and schools at the Supreme Headquarters Allied Powers Europe in Belgium.

The STEM ED initiative goes hand-in-hand with the 21st-century school concept. When developing the plans for a school, you start with the question, "How do I teach in the 21st century?" Then you address the question, "How do I build the school?" We're providing expertise in both areas.

Initiatives such as STEM ED are good, but we need to further our efforts to inspire talented individuals who can keep up with the swift advancement of technology and the unpredictability of military needs. Ideally they would develop the creativity and innovation necessary to support our military and our nation to remain competitive in a rapidly changing environment.

## RETENTION

Scientists and engineers are in demand all over the globe. So how does an institution like the Army that some perceive as "low-tech," as described by DOD's Joint Advertising, Market Research & Studies data, retain the highly skilled individuals it was able to attract? At

USACE, we have a healthy civilian turnover rate of only about 8 percent, on par with industry. This is due in large part to the priority we place on preserving the skills of our workforce, as well as their ability to work on challenging, rewarding assignments.

To nurture critical STEM skills, we encourage all USACE employees to partner with mentors and to explore training and certification opportunities comparable to those of their career-military counterparts. As leaders, we must ensure that our workforce understands the value of obtaining and maintaining licenses and certifications. These credentials improve their professional competence and increase the credibility of the individual and the organization.

We also offer the opportunity to work on compelling projects and technologies that are making a difference in people's lives. Some projects are managed through their life cycle and others have a tremendous impact on the local community, such as providing water resources assistance to countries in need, researching carbon nanotube-based materials and identifying their uses for warfighters, and building and restoring habitats for endangered species.

Fostering the development of our employees and providing the opportunity to manage diverse projects allow USACE to remain fully competitive with industry in retaining the highest-qualified STEM talent, and ensure that our workforce can

effectively and expeditiously meet emerging challenges.

## DEVELOPMENT

USACE has many successful leader development initiatives. There is a clear commitment to this at every level, and our USACE team leads by example. One such effort is the USACE Leader Development Program, which is centered on education, developmental assignments and mentoring. Our commanders are closely tied to the program, each knowing which personnel have seen it through to completion. These leaders make workforce development a priority and give it the emphasis it requires.

We also have a professional development module in our annual Emerging Leaders Conference. Junior employees (usually GS-9 through -12) shadow their senior leader sponsors over 2 ½ days and work out the details of a career action plan. This mentorship program helps provide a clearer view of the steps to career progression and simplifies the navigation of a complex civilian personnel system.

It is imperative that we do all that we can to grow our professional leaders. During a time of constrained resources and increasing retirements, we cannot risk attrition of talented and motivated individuals.

## CONCLUSION

At USACE, we are committed to doing our part to address the Army's STEM challenge. To





#### ACES OF STEM

USACE New York District personnel speak with students about the importance of studying and pursuing careers in STEM, at an April 20, 2012, event hosted by the New York City Department of Education. (USACE photo by Chris Gardner)

be leaders in STEM, it is imperative that we use consistent, strategic tactics to attract young students who may have the proclivity for and interest in these fields of study.

Through focused investments in recruitment, retention and development, we can inspire the next generation of high-quality, diverse STEM professionals needed to fulfill our varied technical missions at the highest of standards.

Essayons ... Building Strong ... Army Strong!

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*LTG THOMAS P. BOSTICK became the 53rd U.S. Army chief of engineers and commanding general of USACE in May 2012. As such, he is the senior military officer overseeing most of the nation's*

*civil works infrastructure and military construction. Previously, he was the Army deputy chief of staff, G-1. Bostick received his commission in 1978 upon graduation from the United States Military Academy at West Point, where he earned a B.S. He also holds M.S. degrees in civil engineering and mechanical engineering from Stanford University, and is a graduate of the U.S. Army War College. Bostick is also a licensed professional engineer in Virginia. His awards and decorations include the Distinguished Service Medal, Defense Superior Service Medal, Legion of Merit with Oak Leaf Cluster, Bronze Star Medal, Defense Meritorious Service Medal, Meritorious Service Medal with four Oak Leaf Clusters, Joint Service Commendation Medal, Army Commendation Medal, Army Achievement Medal, Combat Action Badge, Parachutist Badge, Ranger Tab, Recruiter Badge, and the Joint and Army Staff Identification Badges.*



FROM THE DEPUTY ASSISTANT  
SECRETARY OF THE ARMY  
FOR PROCUREMENT  
MR. HARRY P. HALLOCK

# A BIG ROLE *for* SMALL BUSINESS

Even with fiscal disruptions, Army contracting has tools to ensure consistent support of innovative entrepreneurs

**A**s government employees, we weathered a furlough in the 3rd quarter of FY13 and a two-week government shutdown at the beginning of FY14. But how did America's small businesses fare with these interruptions in our support?

We in the Army contracting enterprise are well aware of the significance of small business to our nation's industrial base. Small businesses support our Soldiers with technical innovation and entrepreneurial character that help sustain our leading edge on the battlefield. We rely on this community to meet the enduring and evolving need for innovation in response to current and anticipated threats.

As the deputy assistant secretary of the Army for procurement (DASA(P)), I am committed to maximizing small business participation throughout the Army's buying activities, and I share this message at every opportunity. Last fall, I

had two public occasions to reiterate the commitment of the Army contracting community to America's small businesses, at the National Defense Industrial Association and the Association of the United States Army (AUSA) Small Business Forums. At both events, the Q-and-A sessions turned into town hall-like events that benefited all participants, with an exchange of information on the Army's acquisition efforts to support and maximize small business opportunities.

Folks were not bashful in expressing their views and concerns about today's ever-changing economic environment, the declining budget and their impact on contracting. I heard from small business owners concerned about the Army's approach to doing business with them.

They repeatedly expressed a desire to see more requests for information and draft solicitations that would allow them to comment on areas where they believe the

Army is inconsistent in efforts to meet small business goals.

I agree: There are inconsistencies. We've made our share of mistakes, and we need to review our way of doing business when it comes to supporting the small business community, the way we target small businesses and how we implement our actions at the various contracting offices. We need to be more consistent; that will greatly increase success for America's small business community. We can and will improve. With some of the organizational changes we've made over the past few years and those on the horizon, I can see progress in how we communicate across commands to improve consistency in our contract actions.

## SIGNS OF PROGRESS

We have challenges, but the good news—fantastic news, actually—is that the Army is responsible for the leading share of DOD and federal government small





#### SMALL BUSINESS SOUNDING BOARD

Hallock listens as Paul Gierow, right, president and CEO of GATR Technologies, talks with Roy Priest, GATR's vice president of sales and customer support, during the 2013 AUSA Annual Meeting and Exposition in Washington, DC. Small business owners are concerned about today's ever-changing economic environment, the declining budget and their impact on contracting. (Photo by Kathie Scarrah, Office of the DASA(P))

business opportunities. In FY13, the Army awarded 142,237 actions to small businesses, valued at roughly \$17 billion. Of our total contract actions, 27.31 percent went to small businesses, exceeding the FY13 goal established by DOD. Kudos to the Army contracting community and to our customers and requiring activities that support the small business program, ultimately supporting our Soldiers in the field.

I'm very proud of the Army contracting enterprise support to America's small businesses. As we march on in an era of constrained resources, we must ensure that our buying actions are prudent business decisions that help strengthen the

U.S. industrial base and sustain our leading technological edge.

It takes strong teamwork at all levels of the acquisition process to research and identify small business opportunities with each and every contract action. Early collaboration and partnering with our Army customers and requiring activities are critical. Success lies in engaging small business strategies at the earliest point of acquisition planning to identify small business resources, and to explore new avenues of acquiring services and supplies that both support our small business industrial base and provide fair and reasonable prices to the taxpayer. I am pleased to see these processes resulting in

positive strides in our acquisition planning and market research. Let me share some examples of what the contracting community is doing to improve processes by teaming and disseminating information to the small business community. These actions help us reach our goals and increase small business participation:

- Our use of indefinite-delivery, indefinite-quantity (IDIQ) contracts offers a streamlined approach to bid and proposal submissions and issuance of task order awards. These contract arrangements have given small businesses an edge, and we have evolved to better address small business opportunities within IDIQ contracts. I



#### CONSISTENCY IS KEY

Hallock speaks at the AUSA Small Business Forum in October 2013. The Army is striving to make the best, most consistent use of a variety of tools for contracting with small businesses. (Photo by Kathie Scarrah, Office of the DASA(P))

must caution, though, that we need to be careful not to oversaturate the marketplace with IDIQ contracts that may not be a viable way to meet recurring requirements, given funding cuts and budget uncertainties.

The use of IDIQ contracts was raised by the small businesses community during the two forums I mentioned earlier. Their cost-to-bid versus rate of return can diminish when too many IDIQs are established, straining small business resources to participate. This is not to suggest that we sway our decision-making too far in the opposite direction. Rather, we should be mindful of potential negative impacts when determining the acquisition strategy for our requirements, and make sure we canvass the prevailing market

conditions when deciding on our acquisition and small business strategies.

- Early collaboration with the customer and small business specialists, market research, notices on FedBizOpps.gov and open exchanges with small businesses are now standard. This has allowed us to further set aside contracts or portions of omnibus-type contracts to small businesses.
- Engaging small business specialists at the very outset of the procurement strategy has facilitated our identifying potential small business capabilities and resources. Another concern raised by the small business community is the perception that performing as a small business subcontractor is an obstacle to
- The U.S. Army Corps of Engineers (USACE) has taken a proactive stance in awarding multiple-award task order contracts (MATOCs) to small businesses for a variety of contracts for environmental programs, emergency response, renewable and alternative energy, and construction-related services. Some of the Corps' billion-dollar MATOC strategies were structured to include small business

being considered a prime for future requirements. While it is clear that each requirement is unique and may or may not be a practical candidate for a prime contract set-aside, requirements for products or services that small businesses can provide must be made available to the small business community for bid. In these cases, by all means consideration is given to making the specific requirement a small business set-aside. The fact that a small business has been accomplishing some or all of the work in a subcontractor relationship should be a determining factor in the consideration of a set-aside strategy at the start of acquisition planning.

When procurements are not suitable for 100 percent set-asides for small firms, we continue to ensure maximum consideration for small businesses by including aggressive factor goals for their participation as prime contractors in the source selection plan and/or portions of the base award contracts. The resulting task orders are often set aside for small business awards. DOD and Army policy ensures adherence to the "rule of two," defined as when two small businesses are able to compete under a multiple-award IDIQ—or any requirement, for that matter—thereby setting aside the requirement for small business.



base awards and set-aside task orders. Examples include the Multiple Environmental Government Acquisition and renewable energy acquisitions.

- The U.S. Army Mission and Installation Contracting Command (MICC) increases small business participation by using the U.S. General Services Administration (GSA) Alliant Governmentwide Acquisition Contract (GWAC), set aside for small business. GSA established a GWAC task order or delivery order contract for information technology (IT) for governmentwide use. Use of this contract for IT support services at the San Antonio Military Medical Center, TX, is meeting critical needs while reducing costs by almost a third. A contract was awarded to a small disadvantaged woman-owned business in April 2013 for a potential

three-year period of performance, with a value of \$15.9 million. A large business had held the previous contract for similar services since October 2004.

Across the board, the Army is actively maximizing small business participation by issuing task orders for IT and support services against the GSA GWAC as well. These task orders are being set aside for small business firms. They include awards to Alliant Small Business, 8(a) STARS II and Veteran Technology Services Inc.

With all these different approaches to reach out to small business vendors, the key to success is to figure out when each approach is appropriate. Army contracting has incorporated evaluation processes to foster small business participation at both the prime and subcontractor

levels. For requirements competed under multiple-award IDIQ or blanket purchase agreement arrangements that are not a total small business set-aside, evaluation criteria are included for small business participation; they state that other-than-small-business offerors must include in their proposals a specific percentage of the labor dollars for small businesses, thus requiring the offeror to bring small business firms to the table. The percentage, set by the government, is normally between 25 and 40 percent per year, depending on the requirement's complexity, the location of services to be performed and interest in small business participation, among other factors.

## CONCLUSION

Was 2013, with its disruptions, a prelude to what the Army contracting enterprise can expect in future years? One of the

### A PIECE OF THE PIE

New Orleans-based Bailey-CKY, a small disadvantaged veteran-owned small business, constructs a dewatering ditch at the San Jacinto Placement Area in Galveston, TX, March 26, 2013. USACE has been proactive in awarding MATOCs to small businesses for a variety of contracts. (USACE photo)





#### EFFICIENCY

The GWAC for IT services that MICC – Fort Sam Houston, TX, executed in 2013 supports the creative work of contractors Alissa Kingsley, left, Corey Toye and Terry Smelker at the San Antonio Military Medical Center, while involving small business and reducing costs by almost a third. (Photo by Robert Shields, Brooke Army Medical Center Public Affairs)

tougher issues the enterprise has to face is its ability to successfully manage many competing variables without sacrificing the needs of our Soldiers or the health of the Army industrial base. The Army will continue to rely on industry to help meet the enduring and evolving need for innovation in response to the ever-changing threat and the fiscal climate in which we operate.

The Army contracting team, in close coordination with its Army acquisition partners, will continue to fully support the small business program to achieve our established goals. I have every confidence in the Army's continued commitment to developing opportunities for America's small business community, because the small business footprint makes a big imprint on the success of our contracting enterprise and our Soldiers.

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*MR. HARRY P. HALLOCK was appointed the DASA(P) on July 14, 2013. He manages the development and dissemination of policies,*

*processes and contracting business systems; directs the evaluation, measurement and continuous improvement actions for more than 270 Army contracting offices worldwide, which execute contracts for major weapons systems, base logistics support, construction and wartime operational contracting in Iraq and Afghanistan; and ensures the execution of federal, DOD and Army regulations for acquisition, procurement and related business practices. As the functional career representative for contracting, the DASA(P) oversees the recruitment, training, certification and professional development of the Army's contracting workforce. A member of the Senior Executive Service since 2007, Hallock holds a B.S. in business administration from the University of Delaware and an M.S. in program management from the Naval Postgraduate School. He also completed the LOGTECH Executive Course and the Federal Executive Institute's Army Senior Leadership Development Program. Hallock is Level III certified in life-cycle logistics, program management and contracting, and Level II certified in test and evaluation engineering. He is a member of the U.S. Army Acquisition Corps.*



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# HISTORICAL PERSPECTIVE

To understand the challenges of today's Army organic industrial base, it helps to look to the past

*by LTC(P) Richard B. Debany*

In every conflict after its struggle for independence against King George III, the United States relied upon a national industrial base to deliver and sustain the warfighting materiel necessary for victory. The segment of that base catering specifically to the military is the defense industrial base, a multitude of prime contractors and a complex web of sub-tier suppliers that span the globe. Within the domestic defense industrial base, there is a comparatively small but strategically critical component—a collection of government-owned manufacturing arsenals, maintenance depots and ammunition plants providing rare, often unique, industrial capabilities and skill sets. For the U.S. Army, these facilities are collectively called the Army organic industrial base or “organic base.”

Changing Army requirements, strategic priorities, tolerance to risk and budgetary realities have molded the organic base throughout its existence. Twelve years of persistent war, the approaching end of military operations in Afghanistan and the anticipated economic landscape now necessitate another evaluation of the Army's approach to organic manufacturing and depot maintenance. This reexamination should be mindful of history while it considers challenges faced by the organic base and the Army's ability to leverage the entire defense industrial base. In the end, the Army must manage risk in terms of

balancing affordable industrial capability with the ability to meet any manufacturing demand.

Evolution of the organic base over the past 236 years has been characterized by cycles of expansion and contraction that, not surprisingly, reflected the nation's periods of war and peace. While Great Britain benefited from the dawn of what would later be coined the Industrial Revolution, mid-18th-century America was primarily an agrarian society, with the first significant benefits of domestic industry still decades in the future. With severely limited manufacturing capacity, the fledgling Continental Army received much of its armament from Europe.

The disadvantages of relying upon foreign sources of military supply were apparent at the outset of the Revolutionary War. In an effort to reduce this strategic vulnerability, significant effort was made to rapidly increase domestic industrial capability. During the war, the Continental Congress established five arsenals to manage the arms, ammunition and related materiel required to fight England.

In recognition of a largely successful wartime framework, in its 1794 Act for Erecting and Repairing of Arsenals and Magazines, Congress authorized President Washington to establish or retain up to four national arsenals. While the act formally



created a permanent arsenal system, it also anchored the government's role in directly controlling critical segments of its military's arms supply, a concept that still exists.

### EXPANDING BASE

The late 18th and 19th centuries saw an expansion to 26 arsenals by 1861 and a capability growth from primarily arms repair and refurbishment to specialized manufacturing. The Army led America's transition to industrialization during this period, and arsenals became repositories of specialized and perishable skills critical to manufacturing war supplies. Although the government dominated the domestic arms manufacturing landscape, the Army also used the private sector for design innovation and surge production. By the mid-1800s, however, private industry began to compete in manufacturing sectors once monopolized by the Army.

As the Industrial Revolution continued to gain momentum in the United States and manufacturing capabilities migrated from the public to the private domain, policymakers began to question the utility and necessity of publicly owned factories. In that spirit and because the nation's expansion diminished the relevance of some facilities, the Army Appropriations Act of 1854 authorized the secretary of war, at his discretion, to abolish any unnecessary arsenals. Under this authority, the War Department consolidated down to 18 arsenals by 1883. Despite the reduction, the system as a whole remained intact to foster continuity of supply and competition with the private sector.

Concerned with an overreliance on public industry, BG William Crozier, Army chief of ordnance from 1901 to 1918, questioned the wisdom of a robust public

industrial base. He believed government manufacturing was a disincentive to private capital investment in critical industries, resulting in a national industrial base unable to meet wartime surge requirements. Despite his concerns, reliance on arsenals continued at the expense of fostering flexible civil capacity that could shift to military production.

In hindsight, it's no surprise that the United States found both public and private industry ill-prepared for the

massive World War I mobilization. Poor public-private coordination and rampant inefficiencies plagued the industrial ramp-up and delayed or prevented critical manufacturing output. In the end, European suppliers provided the vast share of ordnance used by the American Expeditionary Force.

Following the armistice, Congress and the War Department took actions to better guarantee industrial surge capability. In its Defense Act of 1920, Congress



### BROTHERS IN ARMAMENTS

Employees work at a machine press at the Gadsden Ordnance Plant in Alabama, in 1942. The plant, which opened in 1941 and closed in 1958, manufactured high-explosive, 105 mm M1 shells. (Photo courtesy of the U.S. National Archives)



### MOTHER OF MUNITIONS INNOVATION

The Frankford Arsenal in Philadelphia, PA, had a long history, starting in 1816 as a storage facility and developing into one of the nation's most well-known ordnance manufacturers, with a reputation for pioneering mechanized production of munitions, such as this clip spring and bolt assembly for .30-caliber cartridges. The arsenal, which served as the nation's principal developer and manufacturer of small arms and artillery munitions, closed in 1976. (Photo courtesy of U.S. National Archives)

established an assistant secretary of war, a crucial initiative to synchronize all aspects of procurement. Notwithstanding the issues experienced during the war, Congress remained committed to the organic base. In opposition to Crozier's prewar arguments, the 1920 Act stipulated that government-owned arsenals and factories would provide the supplies required by the War Department, within the capability of those facilities, so long as the cost of the production did not exceed the cost on the open market.

The authorities of this act, along with those in the Army Appropriations Act of 1854, continue today in the form of the Arsenal Act (Title X, U.S. Code, Section 2474).

Despite the two decades of minimal organic industrial production, World War II's industrial mobilization was executed far more effectively than its 1917 precursor for a variety of reasons. In addition to extensive contingency planning by the general staff in the

years between the wars, unprecedented actions contributing to the success of World War II's industrial mobilization included centralizing control of most aspects of industry and resources, establishment of extensive public-private partnering, and the redirection of virtually the entire national industrial base toward defense.

With war again raging in Europe, the Army began a substantial expansion of the organic base in 1940; however, for





### WAR EFFORT

This poster, produced by the French graphic designer Jean Carlu for the U.S. government in 1942, captures the spirit of the huge World War II-era expansion in facilities producing ammunition, explosives, hardware and even tanks. (Photo courtesy of the University of North Texas Digital Library)

the first time, these facilities were largely government-owned, contractor-operated (GOCO) manufacturing plants. This arrangement allowed private firms to contribute on a massive scale with minimal capital investment and without the risks associated with owning capacity after the war.

The War Department built a staggering 77 GOCO plants from 1940 to 1942. These facilities, producing ammunition, explosives, various hardware and even

tanks, were in addition to the existing government-operated arsenals and countless civilian factories that had converted to wartime production.

In addition to the creation of GOCO plants, this period saw the establishment of a new type of facility: maintenance depots. Unlike the relatively small storage depots of the past, these factory-like facilities enabled the Army to conduct high-volume equipment repair, upgrade and refurbishment—essential capabilities

to sustain materiel in a protracted fight against the Axis powers.

Postwar international relations encouraged the United States to maintain a large standing peacetime Army for the first time in its history. Additionally, unlike after previous conflicts, private industry continued to provide significant arms and equipment while the Army retained a sizable portion of its own industrial base. By 1962, 34 of the wartime contractor-operated ordnance



### FROM THE FIELD TO THE FLOOR

Continuing her service to the nation and a proud tradition in the Army's organic industrial base, Lorri Gill is one of 785 veterans who work at Anniston Army Depot, AL. She served in the U.S. Marine Corps for almost five years, working as a diesel mechanic and earning the rank of corporal. (Photo by Jennifer Bacchus, AMC)



### KEEPING PRODUCTION LINES OPEN

Steve Saunier, A-Line bombs and mines area supervisor in the Industrial Operations Division, Directorate of Ammunition Operations at McAlester Army Ammunition Plant (MCAAP), OK, explains the arming well of a 2,000-pound penetrator bomb to BG Timothy J. Edens, director of Army safety and commanding general of the U.S. Army Combat Readiness/Safety Center, Fort Rucker, AL, during Edens' visit to MCAAP Sept. 17, 2013. MCAAP began production in 1943, part of a substantial expansion of the Army's organic industrial base during World War II. (Photo by Kevin Jackson, AMC)

facilities remained. In 2013, the Army continues to maintain a significant organic base. Today, it consists of six maintenance depots, three manufacturing arsenals, 11 ammunition plants, activities, depots, and centers, and the Joint Systems Manufacturing Center. (See map on Page 22.)

The organic base not only supports current and future defense manufacturing and maintenance needs, but also continues to retain skill sets necessary for unique military industrial requirements.

### A NEW ERA

Criticized for its seemingly inherent inefficiencies, excess capacity and protected status under the Arsenal Act and other public laws, the Army has consistently sought to maintain the organic base's relevance, increase its efficiency and achieve a valuable long-term return on investment. Current defense budget realities, with deeper cuts projected in the post-Afghanistan era, create challenges for the entire defense industrial base. Sustaining the capability and capacity to meet the Army's current, anticipated and potential surge requirements is paramount.

To that end, the Army is continuously reevaluating the organic base's long-term strategy and how it fits into the greater defense industrial base. While the structure of the base is ever-evolving, the Army must decide, given budget constraints, how to prioritize and sustain its most important sectors, elements and capabilities.

Since the founding of our nation, considerable importance has been placed on the role of government in controlling portions of the nation's military industrial capability. However, for the past 65 years, the U.S. military has looked to private industry for the vast majority of its procurement.





### TURNING OUT THE BIG GUNS

In the late 1880s, nearly 70 years after Watervliet Arsenal, NY, produced its first ammunition, it became the Army's first large-caliber cannon manufacturer, a mission that continues to this day. Each cannon tube goes through a rotary forge like this one before it is shaped. The late 18th and 19th centuries saw an expansion from the five arsenals established by the Continental Congress to 26 arsenals by 1861, along with a capability growth from primarily arms repair and refurbishment to specialized manufacturing. Watervliet remains the only domestic manufacturer of large-caliber breeches and gun tubes for the Army. (Photo by John B. Snyder, AMC)

Despite this shift to contracted support, the organic base remains a strategic readiness insurance policy; but what is the right type of insurance, and how much can America afford? Defense budget reductions may soon force hard decisions regarding consolidation, joint-sourcing, outsourcing, privatization and divestiture.

### CONCLUSION

The strategic importance of an effective industrial base is indisputable. In 2011, ADM Michael Mullen, as chairman of the Joint Chiefs of Staff, wrote in the National Military Strategy, "We must...ensure our Nation's industrial base is able to field the capabilities and capacity necessary for our forces to succeed in any contingency." However, as in the past, capability must find balance with cost. GEN Martin E. Dempsey, Mullen's successor as chairman, emphasized in 2012 that affordability and financial stewardship were key to developing the Joint Force of 2020.

The U.S. Army Materiel Command (AMC) considered these imperatives in its "United States Army Organic Industrial Base Strategic Plan 2012-2022." In it,

AMC provided a framework that sought to ensure the viability, effectiveness, efficiency and availability of the organic base to meet future wartime surge requirements in a drawdown environment.

History tells us that after mobilization surges, the pendulum of military industrial readiness often swings to the side of potential ruin if not guided by informed policy and logical strategy. As the nation enters an era of budget austerity, the decisions the Army makes regarding the organic base must consider the long-term stability and agility of the greater defense industrial base as a global entity, and the government's ability to leverage its capabilities. The Army must find the harmonious balance of industrial capability, affordability and risk.

*For in-depth information on the origins of continental armories and arsenals and the management of American arms and their manufacture during the Revolutionary War, see Robert F. Smith's dissertation "A Veritable... Arsenal' of Manufacturing: Government Management of Weapons Production in the American Revolution," available at: <http://books.google.com/>*

*[books?id=8Ei7gSPQYTMc&lpg=PP1&pg=PP1#v=onepage&q&f=false](http://books.google.com/books?id=8Ei7gSPQYTMc&lpg=PP1&pg=PP1#v=onepage&q&f=false).*

*In addition to the Army, other U.S. military services possess various types of industrial capability. For more information about Title X, U.S. Code, Section 2474 ("Centers of Industrial and Technical Excellence: Designation; Public-Private Partnerships") and each of the services' depot maintenance capabilities, see the "Depot Maintenance" webpage of the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness, Deputy Assistant Secretary of Defense for Maintenance Policy and Programs, at <http://www.acq.osd.mil/log/mpp/depot.html>.*

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## FIELD EXPEDIENT

# ‘MORE’ *is* BETTER

At warfighters’ request, Army delivers  
award-winning ration enhancement  
to help them in extreme conditions

*by Mr. Joseph Zanchi and Ms. Alexandra Foran*

Warfighters in extreme, demanding operational environments need additional sustenance to complete their missions successfully—they simply need MORE. In this case, MORE is the Modular Operational Ration Enhancement, developed by the Combat Feeding Directorate (CFD) at the U.S. Army Natick Soldier Research Development and Engineering Center (NSRDEC) as a direct result of requests from warfighters deployed in Iraq and Afghanistan.

“We received feedback from the field that some warfighters were losing weight and they needed extra calories,” said Julie Smith, a CFD senior food technologist. Smith, along with Jim Lecollier, chief of the Individual Rations Branch, Defense Logistics Agency (DLA) Troop Support, worked with their respective teams from 2008 through 2013 to develop the

MORE family of ration supplements specifically to meet this need.

MORE provides additional nutrition to warfighters operating in high-stress environments when their caloric requirements exceed those provided by their daily operational rations. MOREs are designed to augment the Meal, Ready-to-Eat (MRE), First Strike Ration (FSR) and Meal, Cold Weather/Long Range Patrol, as well as the family of Unitized Group Rations.

The MRE satisfies the Army surgeon general’s strict requirements for nutrition in operational rations. Each MRE provides approximately 1,300 calories. An FSR, which replaces three MREs, has an average of 2,900 calories per ration. The MORE has an average of 1,110 calories per package.

Army Regulation 40-25, “Nutrition Standards and Education,” a joint

regulation of the surgeons general of the Army, Navy and Air Force, establishes nutritional standards, termed “military dietary reference intakes,” for military feeding. Among these are nutritional standards for operational rations and restricted rations.

When warfighters conduct dismounted operations in challenging terrain, carrying more than 100 pounds of equipment up and down the mountains of Afghanistan with elevations as high as 12,000 feet, they can burn significantly more calories than when operating at sea level.

The MOREs are designed to provide the additional calories and nutrients to supplement their MREs or FSRs and give them the nutrition they need.

### **MORE, HOT AND COLD**

Currently, there are two types of MOREs targeted for the different extremes of





#### AIMING HIGH

SGT Zachary McDonell, an infantryman with 1st Battalion, 506th Infantry Regiment “Red Currahee,” 4th Brigade Combat Team (BCT), 101st Airborne Division (Air Assault), climbs a mountain trail with fellow Currahees on a joint patrol with Afghan National Army soldiers in Paktia province, Afghanistan, Oct. 21, 2013. High altitudes are one of the conditions for which MORE is designed, specifically with high carbohydrate content to combat acute mountain sickness. (U.S. Army photo by SSG Todd A. Christopherson, 4th BCT Public Affairs)

operational environments—high altitude and cold weather, and hot weather. Each type has three different varieties, for a total of six different MORE packs.

CFD collaborated with the U.S. Army Research Institute of Environmental Medicine to understand the unique nutritional needs of warfighters in these operational environments, said Smith.

“We reviewed literature and conducted focus groups to identify food preferences of warfighters when conducting missions in high altitude and cold weather, and hot weather environments.”

Three MREs a day provide warfighters with a minimum of 3,600 calories, satisfying their nutritional needs for most

missions. “However, there are some instances during exceptionally heavy activity where warfighters will need between 4,500 and 6,000 calories per day,” said Smith. MORE provides that additional nutritional “oomph,” giving warfighters approximately 1,000 extra calories in a balance of carbohydrates, caffeine, electrolytes and vitamins for these operational environments.

The first MORE enhancement pack developed by CFD was the MORE – High Altitude/Cold Weather. At the time, military service representatives tasked CFD to develop an enhancement pack to counter weight loss and fatigue, and to improve the cognitive and physical performance of warfighters operating in the mountainous terrain of Afghanistan. Increased energy

requirements during high-altitude operations, coupled with symptoms of acute mountain sickness, made this a challenging requirement to meet.

Acute mountain sickness, with symptoms including anoxia, headache, nausea and vomiting, is caused by reduced air pressure and lower oxygen levels at high altitudes. The faster you climb to a high altitude, the more likely you are to get acute mountain sickness. “The MORE is designed to be high in carbohydrates to combat acute mountain sickness. Research has shown that consuming a diet high in carbohydrates can lower the symptoms,” said Smith.

In hot weather environments, hydration is particularly important, which is why

Julie Smith, a CFD senior food technologist, shows off MORE, which she helped to develop over the past five years to meet the caloric needs of Soldiers operating in extremes of heat, cold and altitude. (Photo by David Kamm, NSRDEC)



There are two types of MORE, one designed for high altitude and cold weather, and another intended for hot weather operations. Packs contain popular items including caffeinated pudding, carbohydrate-enhanced beverages, First Strike bars, nut mixes and Zapplesauce, which is applesauce fortified with maltodextrin, an energy-dense carbohydrate. (Photo by David Kamm, NSRDEC)

MORE – Hot Weather prototypes were field-tested with the 75th Ranger Regiment at the Pre-Ranger Course at Fort Benning, GA. MORE prototypes were also provided to special operations forces



during high-altitude training in Colorado; deployed units of Combined Joint Task Force 82 in Afghanistan; and to Engineer and National Guard Scout units at Bagram Airfield, Afghanistan, during Operation Enduring Freedom.

“We assessed results from individual ration field evaluations to identify ration components with the highest acceptability and consumption rates,” said Smith. “Feedback from warfighters indicated they preferred ration components that were easy-to-consume, eat-on-the-go, snack-type foods, rather than meals that would require time to heat and prepare.”

Each pack is calorically dense and weighs only three quarters of a pound. Packs are filled with popular items including caffeinated pudding, energy gels, carbohydrate-enhanced beverages, First Strike bars, nut mixes, crackers, caffeinated gum and Zapplesauce, which is applesauce fortified with maltodextrin, an energy-dense carbohydrate and a source of energy to help maintain physical performance.

“Zapplesauce and First Strike bars provide the warfighter with essential complex carbohydrate,” said Smith. Each food item serves a specific purpose for the warfighter. As with other operational rations, the goal is for the warfighter to consume every item to meet appropriate caloric needs.

#### AWARD-WINNING WORK

For their work in developing MORE, Smith and Lecollier received the prestigious COL Rohland A. Isker Award in 2013 for leading their respective teams in developing, transitioning, acquiring and fielding MORE. The award is an annual honor from the Research and Development Associates for Military Food and Packaging, better known as R&DA, to recognize civilian employees



#### MOUNTAIN-TESTED

Afghan Border Police (ABP) and Soldiers from ABP Zone 1, 1st Brigade Combat Team, 101st Airborne Division hike from their landing zone to Observation Point 12 along the Afghanistan-Pakistan border, Jan. 21, 2013. Development of the MORE – High Altitude/Cold Weather involved warfighters from the U.S. Army Mountain Warfare Training School at Camp Ethan Allen, VT, and the Connecticut National Guard’s 1st Battalion, 102nd Infantry Regiment Mountain Training Group. (U.S. Army photo by SGT Jon Heinrich, CT 1-101 Public Affairs)

of the federal government or military personnel for outstanding contributions to national preparedness. Isker, a pioneer in Army food service research and development, founded R&DA in 1946.

“Our review board at R&DA felt the MORE project and the ultimate fielding of the ration supplement itself had the most beneficial impact on warfighters (Soldiers, Marines and special operators) of any recently introduced operational ration product,” said John McNulty, executive director of R&DA.

“MORE met a very compelling need to introduce much-needed calories and other nutrients into the diets of these warfighters during particularly stressful situations on the battlefield during extreme weather conditions. It was a success story that worked and received very high accolades from the field,” McNulty said.

MORE also provides warfighters with important enhancements to improve

mental alertness and physical endurance and, like all CFD products, is “Warfighter Recommended, Warfighter Tested, and Warfighter Approved.” MORE is currently available for procurement through DLA Troop Support at <http://www.troopsupport.dla.mil/subs/>.

For more information, contact Joseph Zanchi at [joseph.a.zanchi.civ@mail.mil](mailto:joseph.a.zanchi.civ@mail.mil).

MR. JOSEPH ZANCHI is a logistics management specialist assigned to CFD at NSRDEC. He has a B.S. in business administration from Babson College and a certificate in project management from Boston University. Zanchi is Level III certified in life-cycle logistics.

MS. ALEXANDRA FORAN is a public affairs contractor at NSRDEC. She holds a B.A. in writing and journalism from Eastern Nazarene College.

# SPOTLIGHT

## MR. JARED HIGGS

*by Ms. Susan L. Follett*

Some of Jared Higgs' earliest memories are of time spent with his father in his shop at the Red River Army Depot (RRAD), in Texarkana, TX. So it's no surprise that when the time came to determine his own career path, he followed his father and grandfather and became a heavy equipment mechanic. Altogether, three generations of his family have worked at the depot for a total of 60 years.

"My dad has always been a mechanic, and since I was little, I was with him, working and watching. I can remember coming out to the depot to see his shop. I've always had some type of interest in it, and I enjoy working with my hands," said Higgs, 30, a native of Texarkana.

"When I was 8 or 9 years old, we came out for a Christmas event, and I got to take my first ride in an Army tank. That's a day I'll never forget," he said. "When I was older, we had what they called a shadow day, and I was able to come out and spend a whole day with my dad, walking with him to all his meetings and seeing what his job at RRAD entailed day to day."

Higgs' father, Eddie Higgs, recently retired from RRAD after a 37-year career that began in 1976. His grandfather, John Woodard, worked at the depot from

1974 until 1994. "He worked on Bradleys for as long as I can remember," said Higgs. "It's definitely a family affair. My great-grandfather worked for the depot, too, before I was born."

### A LEGACY OF EXCELLENCE

The mission of RRAD, in operation since 1941, is to conduct ground combat and tactical system sustainment maintenance operations and related support services for U.S. and allied forces. RRAD repairs and rebuilds a variety of mission-essential combat and tactical vehicles and equipment, including the Mine Resistant Ambush Protected (MRAP) vehicle, the High Mobility Multipurpose Wheeled Vehicle (HMMWV) and the Bradley fighting vehicle system. The depot is the Army's only two-time winner of the Robert T. Mason Award for Depot Maintenance Excellence, given by the secretary of defense. The award recognizes outstanding achievements by field-level units engaged in military equipment and weapon system maintenance within DOD.

In addition, RRAD is a Center for Industrial and Technical Excellence for several combat and technical vehicles, the Multiple Launch Rocket System, rubber products and Patriot missile recertification. Its HMMWV recapitalization facility can

produce up to 40 vehicles per day, and its Rubber Products Division is the only DOD organization capable of remanufacturing road wheels and track.

### SERVING THOSE WHO SERVE

Having joined RRAD in 2004, Higgs has worked on a variety of vehicles, including HMMWVs, Bradleys, the Family of Medium Tactical Vehicles and several types of MRAPs. He currently works on the M1117 armored security vehicle. "I'm working on the CROWS, which is the Common Remotely Operated Weapon Station, checking the weapon systems out,

**DURING MY TIME OVERSEAS, I REALLY VALUED THE ABILITY TO WORK DIRECTLY WITH SOLDIERS—TO MEET THEM AND TALK WITH THEM, AND TO KNOW THAT WE WERE HELPING GET THEM BACK OUT IN THE FIELD."**





#### FROM THE INSIDE OUT

Higgs checks a 40 mm grenade launcher on a CROWS-equipped M1117 armored security vehicle. Since joining RRAD in 2004, he has worked on a variety of vehicles, including HMMWVs, Bradleys, the Family of Medium Tactical Vehicles and several types of MRAPs as well. (Photos by Chase Shelton, RRAD)





#### DETAILS, DETAILS

Higgs closes the day sight lens on the M117 in preparation for an optical test. His job is to make sure that vehicles' weapon systems have firing capabilities and that all the parts are functional.

making sure they have firing capabilities and that all the parts are functional."

Although Higgs' tenure is short by comparison to those of his father and grandfather, he's seen his share of changes in the past decade. "I think more than anything, the protective armor has progressed the most. When I first started on the HMMWVs, they were not outfitted with any armor at all, and as our involvement in Iraq continued, I saw things shift, first to up-armored vehicles and from there to the MRAPs."

In 2008, Higgs volunteered for overseas deployment and was deployed to Camp Liberty in Baghdad, Iraq. Over the next three years, he would also see deployments to Forward Operating Base Speicher in Tikrit and Camp Stryker in Baghdad. "I saw it as an opportunity to help where it was needed, and to serve the warfighter. It was also a chance to serve along with my brothers, who were in the Air Force at the time."

Since 2001, RRAD has deployed more than 3,000 personnel to various areas in Southwest Asia in direct support of warfighters in the field. The facility, with a government civilian workforce of about 4,500, has deployed more employees than any other civilian organization in the world since the beginning of overseas contingency operations, staffing roughly half of all U.S. Army Materiel Command civilian deployments. It has spearheaded numerous depot-level logistics and maintenance missions in Southwest Asia, including Heavy Equipment Transporter, Stored Theater Provided Equipment – Iraq, Forward Repair Activity and Mobile Maintenance Team.

"Being away from home is always a challenge. I missed my family and friends, and

I realized that it was important to make friends quickly and find people there you can trust. Overseas, we're around our co-workers day in and day out, 24 hours a day, so finding people you can rely on is vital," he said.

The work itself was a challenge, he said. "Every day, we'd have vehicles coming into us in all kinds of condition—convoys, blown-up trucks, you name it—and the challenge was to get them fixed and back out so the Soldiers could continue on their mission. During my time overseas, I really valued the ability to work directly with Soldiers—to meet them and talk with them, and to know that we were helping get them back out in the field," he added.

#### HARD OR EASY, ALWAYS GOOD

"My dad and grandfather didn't have too much advice when I started working here," Higgs said. "They said that sometimes the work would be hard and sometimes it would be easy, but it was always a good place to work. Looking back over the past 10 years, I can definitely say they were right."

His own advice for anyone interested in becoming a heavy equipment mechanic is simple. "Stick with it and be knowledgeable about what you're working on. Always go the extra mile to learn something more about the vehicle."

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*MS. SUSAN L. FOLLETT provides contracting support to the U.S. Army Acquisition Support Center for SAIC. She holds a B.A. in English literature from St. Lawrence University. She has more than two decades of experience as a journalist and has written on a variety of public and private sector topics, including modeling and simulation, military training technology and federal environmental regulations.*





### PREPARING FOR ACTION

Higgs inspects the mount and quick-release pins for the M117's M249 Squad Automatic Weapon.



# Acquisition *and* Contracting AWARDS

Army honors 25 individuals and teams  
for excellence and professionalism

*by Army AL&T staff*

**T**he Army honored the winners of the 2013 Army Acquisition Awards and the Secretary of the Army Awards for Excellence in Contracting Nov. 13 in a small ceremony at the Pentagon.

Presiding at the presentation were the Hon. Heidi Shyu, assistant secretary of the Army for acquisition, logistics and technology (ASA(AL&T)) and Army acquisition executive; LTG William N. Phillips, principal military deputy to the ASA(AL&T); Harry P. Hallock, deputy assistant secretary of the Army (DASA) for procurement; and Wimpy Pybus, DASA for acquisition policy and logistics.

“These awards are the most prestigious in our field. They represent the professionalism, dedication and innovation across our acquisition community,” Shyu said in presenting the acquisition awards.

In presenting the contracting awards, Hallock said, “The stellar work done by the awardees and nominees demonstrates real

ingenuity and a genuine commitment to Army contracting, both at home and in the field.”

This is the 37th year for the Army Acquisition Awards, which recognize individuals and teams as exceptional among their peers for their skill, efficiency and dedication to the acquisition mission.

The Secretary of the Army Awards for Excellence in Contracting also are presented annually, recognizing individuals, teams and organizations for outstanding performance, dedication and professionalism in executing the contracting mission worldwide.

## ARMY ACQUISITION AWARDS

Following are the 2013 winners:

**Continuous Performance Improvement—Streamlining Special Operations Forces Program Management, Lean Six Sigma Project Team**, Program Executive Office Simulation,





#### PEO STRI CONTRACTING NCO HONORED

Phillips, left, and Hallock join Shyu as she presents the 2013 Noncommissioned Officer Award for Contracting Excellence to Dr. James Blake, Program Executive Officer STRI, who accepted it Nov. 13, 2013, on behalf of MSG Tracy A. Drowne, one of only two 51C NCOs within PEO STRI. (Photo by Robert E. Coultas, Army AL&T magazine)

Training and Instrumentation (PEO STRI), Orlando, FL.

**Noncommissioned Officer Award for Contracting Excellence (tie)—SFC Tracy A. Drowne**, PEO STRI, and **MSG Andrea Dailey**, U.S. Army Mission and Installation Contracting Command (MICC) Mission Contracting Office – Fort Hood, TX.

**Director, Acquisition Career Management Award—Robert T. Kowalski**, PEO Ammunition, Project Manager Maneuver Ammunition Systems.

**Project Manager of the Year—COL Patrick Mason**, Technology Applications Program Office, U.S. Army Special Operations Aviation Command.

**Acquisition Director of the Year at the Colonel Level—COL James Winbush Jr.**, U.S. Army Test and Evaluation Command (ATEC).

**Product Manager of the Year—LTC Steven Clark**, Product Manager MH-60 Special Operations Forces Aircraft, U.S. Army Special Operations Aviation Command.

**Acquisition Director of the Year at the Lieutenant Colonel Level—LTC Maria Schneider**, MICC – Fort Belvoir, VA.

**Logistician of the Year—Kenneth W. Virgil**, U.S. Army Materiel Command Logistics Support Activity.

#### ACQUISITION EXCELLENCE AWARDS

**Transforming the Way We Do Business Award—CH-47 Chinook Multiyear II (MY II) Evaluation Team**, U.S. Army Contracting Command – Redstone, AL.



#### OUTSTANDING CONTRACTING OFFICER AWARD

Sonya DeLucia of ACC – Aberdeen Proving Ground's Huachuca Contracting Division, AZ, received the Outstanding Contracting Officer Award for Specialized Services and Construction Contracting in recognition of her work executing a contract for operations, maintenance and defense of Army communications systems in Southwest and Central Asia, providing support to more than 40 sites in several countries with more than 1,700 contractor personnel. (Photo by Lisa Padilla, ACC – APG)

**Equipping and Sustaining Our Soldier's Systems—Stryker Double-V Hull Army Test and Evaluation Integrated Program Team**, ATEC, U.S. Army Training and Doctrine Command Capability Manager Stryker Brigade Combat Team, Program Manager Stryker Brigade Combat Team, U.S. Army Research Laboratory and U.S. Army Armament Research, Development and Engineering Center.

**Individual Sustained Achievement—LTC Raymond Morgan III**, Defense Contract Management Agency Lockheed Martin Sunnyvale, CA, Contract Management Office.

**Information Enabled Army—U.S. Special Operations Command Global Video Surveillance Activity Team**, PEO – Special Operations Forces Warrior.

#### SECRETARY OF THE ARMY CONTRACTING AWARDS

**The Barbara C. Heald Award—Irvin G. Bonus**, 413th Contracting Support Brigade, Regional Contracting Office – Hawaii, U.S. Army Contracting Command (ACC), Expeditionary Contracting Command (ECC), Wheeler Army Airfield, HI.

Barbara C. Heald retired after 27 years of service, but returned to work. She was killed on her third tour of duty during a rocket attack on the U.S. Embassy compound in Baghdad, Iraq, in 2005.

The award is presented to the DA civilian who clearly demonstrates selfless service, extraordinary and uncompromising professionalism in contracting, and true commitment to the personal and professional growth of others.

**AbilityOne—New England Soldier Systems and Individual Equipment (NESSIE) Team**, ACC – Aberdeen Proving Ground (APG), Natick Contracting Division, Natick, MA.

**Outstanding Contract Specialist/Procurement Analyst—Linda M. Finan**, 409th Contracting Support Brigade (CSB), ECC, Kaiserslautern, Germany.

#### OUTSTANDING CONTRACTING OFFICER AWARDS

**Installation Level – Directorate of Contracting—Thomas R. Guyer**, 409th CSB, ECC, Theater Contracting Center, Kaiserslautern, Germany.

**Systems, R&D, Logistics Support (Sustainment) Contracting—Lovisa D. Parks**, PEO STRI.

**Specialized Services and Construction Contracting—Sonya DeLucia**, ACC – APG, Huachuca Contracting Division, Fort Huachuca, AZ.

**Contingency Contracting—MAJ William J. Griffin**, 413th CSB, Regional Contracting Office – Hawaii, ECC, Wheeler Army Airfield, HI.

#### OUTSTANDING UNIT/TEAM AWARDS

**Systems, R&D, Logistics Support (Sustainment) Contracting (tie)—Family of Heavy Tactical Vehicles Evaluation Team**, ACC – Warren, TACOM Life Cycle Management Command; and **CH-47 Chinook MY II Evaluation Team**, ACC – Redstone.

**Contingency Contracting—U.S. Army Corps of Engineers North Atlantic Division, Super Storm Sandy Immediate Response Team**, Directorate of Contracting, North Atlantic Division.

**Installation Level – Directorate of Contracting—Virtual Procurement Management Review (PMR) Team FY13**, ECC, Huntsville, AL.

**Specialized Services and Construction Contracting—Supply, Expeditionary and Construction Team**, 414th CSB, ECC, Vicenza, Italy.

*For complete information on the winners, go to <http://asc.army.mil/web/access-evts-army-honors-acquisition-and-contracting-award-winners/>. Photos from the ceremony are now available on the U.S. Army Acquisition Support Center Flickr page at <http://www.flickr.com/photos/usaasc/sets/>.*





### ARMY SPECIAL OPERATIONS AWARDS

COL Patrick Mason, left, and LTC Steven Clark, right, both of U.S. Army Special Operations Aviation Command, are the 2013 Project Manager of the Year and Product Manager of the Year, respectively. Joining them at the Nov. 13 awards ceremony at the Pentagon was James Geurts, center, U.S. Special Operations Command acquisition executive.



### TWO AWARDS FOR CHINOOK TEAM

The CH-47 Chinook MY II Evaluation Team of ACC – Redstone received both an acquisition and a contracting award in 2013. Gathering at the Nov. 13 award ceremony at the Pentagon were members of the team and colleagues, from left, LTC Reese Hauenstein, Michael Heath, Steve Chisgar, Ingrid Walden, Rod Matthews, Robin Hadlock, Georgia Walker and COL(P) Robert L. Marion. (Photos by Robert E. Coultas, Army AL&T magazine)

# JLTV TEAM WINS PACKARD AWARD

Army-Marine Corps development group  
receives DOD's highest honor for acquisition

*by Army AL&T staff*

**T**he joint Army-Marine Corps team responsible for developing the Joint Light Tactical Vehicle (JLTV) was one of four teams throughout DOD to receive the David Packard Excellence in Acquisition Award, the department's highest honor for acquisition, at a Pentagon ceremony Nov. 25, 2013.

Dr. Ashton B. Carter, before departing as deputy secretary of defense, praised the four acquisition teams in presenting them with the award. "I can think of no better way to spend one of my last days as deputy secretary of defense than by acknowledging these men and women who have worked so hard to make our department succeed," Carter said.

The David Packard Excellence in Acquisition Award, which dates to 1997, honors the late David Packard, a co-founder of Hewlett-Packard, former deputy secretary of defense and advocate of excellence in defense acquisition practices. The award recognizes organizations, groups and teams that have demonstrated superior program management, exemplary innovation and accomplishment in successfully executing the department's Better Buying Power initiatives.

## OVERCOMING OBSTACLES

Acknowledging the challenges that DOD's civilian workforce has faced recently, including furloughs and the government shutdown, Carter said that the work of acquisition professionals is vital to DOD's success.

"You stuck with us, despite all these recent challenges," Carter said. "I know why you do it. You do it because you get to wake up every morning and be part of something bigger than yourselves."

In these challenging times, it's particularly important to honor outstanding public servants, Carter added. "The impact that they can make—all of them—[is] represented today by our distinguished honorees," he said.

The Packard Award winners are:

- The **JLTV team**, for its cost-saving efforts in restoring the mobility, payload-carrying capacity, rotary-wing transportability and overall safety of Army and Marine Corps light tactical vehicles.
- The **U.S. Navy's Air and Missile Defense Radar (AMDR) team**, for its cost-saving and risk reduction initiatives in the





#### JOINT ARMY-USMC WIN

Dr. Ashton B. Carter, left, presents the David Packard Excellence in Acquisition Award to COL John R. Cavedo Jr., project manager, Joint Program Office (JPO) JLTV; LtCol Michael S. Burks, Program Manager Light Tactical Vehicles and military deputy, JPO JLTV, and Scott Rideout, Deputy Program Manager Light Tactical Vehicles, Program Executive Officer Land Systems. (DOD photo by Erin A. Kirk-Cuomo)

pre-engineering, manufacturing and development phase of the AMDR, a major defense acquisition program.

- The **U.S. Air Force's HC-130J Combat King II and MC-130J Commando II Program team**, for its innovative recapitalization program to procure 131 aircraft for Air Combat Command and Air Force Special Operations Command.
- The **Defense Information Technology Contracting Organization and Air Force National Capital Region Information Technology Team**, a Joint Defense Information Systems Agency and Air Force team, for its

cost-saving ability to respond quickly to real-world needs for scalable information technology services and help desk support.

"All four of these teams have made a huge difference to the department," Carter said, adding, "The accomplishments of our recipients today showcase precision, business acumen, innovation, dedication and teamwork at every stage of the acquisition process."

The honorees' cumulative efforts "have saved the department billions of dollars," Carter said. "Being responsible stewards

of taxpayer money is always a top priority for us, but it's particularly appreciated during these times of shrinking budgets and fiscal uncertainty.

"You have proven that we do not have to sacrifice performance and capabilities in order to achieve speed and savings," Carter added. "Your successes show that we can have effective oversight, but above all, better value for the taxpayer and the warfighter."

For more information, go to <http://www.dau.mil/AcqAwards/Pages/packard.aspx>.



## CAREER CORNER

### USAASC PERSPECTIVE

FROM THE DIRECTOR,  
U.S. ARMY ACQUISITION SUPPORT CENTER

# CONTINUOUS PERFORMANCE IMPROVEMENT *is the NAME of the GAME*

*“Everything we do, every process we adopt and every organizational adjustment we make serves a single purpose: get our Soldiers to the fight; provide discriminatory advantage to our Soldiers; and enable our Soldiers to return home safely.”*

—The Hon. Heidi Shyu, Army acquisition executive, Virtual Town Hall, July 11, 2011

The Army acquisition enterprise faces many challenges, from fiscal constraints to potentially broad budget cuts, not to mention ever-changing and increasing congressional demands and expectations. To reach mission objectives in this environment, we need to not accept the status quo, but to seek constantly to refine our processes and procedures. Ms. Shyu has provided the central focus and priority for all our decision-making and actions. That means all of us must adopt a culture of continuous performance improvement (CPI) in every aspect of how we do business. CPI is about seeking affordability and efficiencies at every level of an organization. It's a management process that is not solely executed by management.

Our new resource-constrained environment has increased expectations in the management of performance and has increased the need to create efficiencies and report return on investment. CPI provides a framework to identify and understand opportunities and potential issues, in order to recognize solutions and implement improvements to stay aligned

with increased needs and expectations. (See Figure 1.)

#### TIPS FOR ENACTING CPI

To truly change the culture, everyone at every level of the enterprise must be active in CPI efforts. But, as with most things in life, too much of a good thing can sometimes lead to unpleasant outcomes. Change is good, but changing for the sake of change can lead to frustration and unproductive behaviors.

The following tips are ways you can integrate CPI into everything you do:



**Craig A. Spisak**  
Director, U.S. Army  
Acquisition Support Center

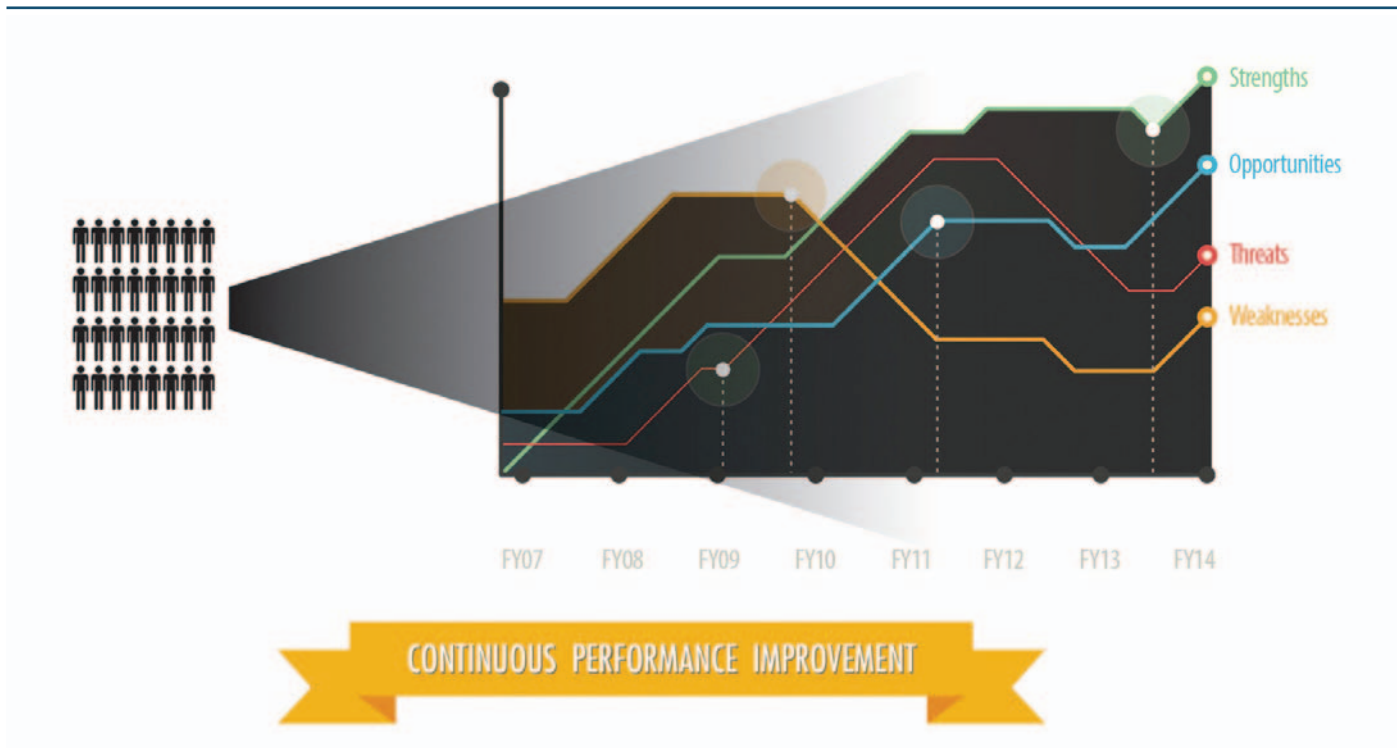
- **Have a plan:** The first step is to assess your current state, then make a plan for where you want to go. A successful plan includes identifying your strengths, weaknesses, opportunities and threats (SWOT), and establishing your intended goal.

The SWOT analysis helps you to determine strengths, or things you excel at, skills, abilities, assets, etc.; weaknesses, or things you're not so good at or need but don't have; opportunities, such as to broaden skills or form potential partnerships; and threats, such as environment shifts, changing expectations or furloughs. Focus your efforts on your strengths versus your weaknesses. This may sound contradictory to CPI, but it's not. Knowing the things that set you apart may increase your morale, boost confidence and ignite a desire to achieve even more.

- **Have a vision and set “stretch” goals:** Expand your perspective through imagination, insight and boldness. Force yourself to see beyond the present environment, conditions and



FIGURE 1



#### ALWAYS IMPROVING

CPI operates in a framework that not only examines an organization's strengths, opportunities, threats and weaknesses at every level but also adapts to changing conditions over time. (SOURCE: USAASC)

boundaries. Manifest your vision by creating specific and achievable goals and enlisting participation from others. Your goals should be challenging but realistic. This will aid in growth and development, as well as give a sense of pride and accomplishment once the goal has been achieved. Four points to consider:

1. First, ask yourself, "How will this impact the organization?" and, "Does the goal align with the organization's strategic priorities?"
2. Be realistic: Don't set yourself, the program, unit or organization up for failure and frustration; keep goals within budget and resource constraints. Do not set goals just for the sake of setting goals.
3. Know the compelling need for the

goal: Align goals with strategic priorities to maximize impact; assess the costs and benefits of the goal and implementation efforts; and identify why others should buy in to helping you achieve the goal.

4. Know your "change readiness or maturity": Changing too quickly or trying to change too much may result in numbness to change or frustration, and can lead to unproductive behaviors.

- **Identify and communicate the "compelling need":** It is important to dream big, but equally important is to gain buy-in from others. Failure to gain buy-in from the people doing the work is one of the main reasons why change fails in an organization. Provide the reasons your change efforts are needed.

Identify the "What's in it for me?" for every level of the organization that will be impacted by the change effort.

- **Encourage synergy:** It is important to create an environment where every member of the team, office or organization feels a part of one big team. Advantages of synergy are more robust communications; better decision-making because of a broader perspective; increased conscientiousness and devotion; and increased engagement in the efforts of the organization.
- **Model behavior and commit to change efforts:** Model, advocate and commit to a CPI culture. Your actions will influence and

encourage others to adopt and commit to the culture as well; facilitate rapport; and enable you to provide encouragement if you spot a co-worker or team engaged in an improvement effort or having achieved success.

- **Use a standardized management framework, not necessarily tools:** A management framework is a structure used to identify business areas that have the greatest need for improvement and a need for performance management goals. Know what management framework your organization employs, and base your change efforts on that. Use the performance improvement subject-matter experts in your organization, such as the CPI director, a Lean Six Sigma belt or a member of the quality office, to help you determine the appropriate tools to help you achieve your performance management goals.
- **Measure to ensure traceability and credibility.** Measuring allows us to evaluate performance progress and ensure that efforts expended deliver real results and improve performance. In addition, it enables evaluation and adjustments, as needed, to optimize transformation efforts. With ever-increasing business pressures, we must ensure that we are executing business strategies more effectively

and efficiently. Proper measuring allows us to adjust while supporting effective decision-making.

- **Document, document, document:** This is possibly the most-often overlooked of the tips, yet one of the most vital components of managing performance. Early in my career, I was told, “If it’s not documented, it’s not done.” Documentation is important to support decisions; it should be accomplished with the intent to share information and to record details, trends and any success or failure.

## CONCLUSION

Our job, as Ms. Shyu noted, is to “get our Soldiers to the fight; provide discriminatory advantage to our Soldiers; and enable our Soldiers to return home safely.” Changing the culture to one of continuous improvement is one way we can do that better.

As the Army acquisition enterprise continues to adjust to a CPI culture, we must understand that “small efforts” are just as vital to our success as the multimillion-dollar efforts. The key to our success is to be patient and stay the course in sustaining a culture of CPI, in which every voice within the organization is heard, and where “seeking efficiencies” becomes the status quo—not the exception.



UNITED STATES ARMY

# DACM

DIRECTOR, ACQUISITION CAREER MANAGEMENT OFFICE

[asc.army.mil](http://asc.army.mil)

For anything acquisition career-related.












## EDUCATION and TRAINING UPDATE

### EDUCATION AND TRAINING OPPORTUNITIES

**The Defense Acquisition University — Senior Service College Fellowship** (DAU-SSCF) announcement will open Jan. 29 and close April 2. This Military Education Level 1, Army-approved program, which provides SSC equivalency, is available in your local commuting area if you live in Maryland (Aberdeen Proving Ground), Alabama (Huntsville) or Michigan (Warren).

The purpose of the SSCF is to provide leadership and acquisition training to prepare senior-level civilians for senior leadership roles such as product or project manager, program executive officer (PEO) and other key acquisition positions. Participants not only graduate from an SSC, but also complete the Army Program Manager's Course (PMT 401) and have the option to complete a master's degree. For information on this GS-14/15 SSC, go to <http://asc.army.mil/web/career-development/programs/defense-acquisition-university-senior-service-college/>.

The announcement will be offered through the Army Acquisition Professional Development System (AAPDS). To access AAPDS, go to the Career Acquisition Management Portal <https://rda.altess.army.mil/camp/> and log in. Next, click on the Career Acquisition Personnel and Position Management Information

System (CAPPMS). Once in CAPPMS, select the "AAPDS" tab, then the "Application Module" link. Click on "Apply" and view all available opportunities from the Army director for acquisition career management (DACM).

**REMINDER:** Applicants need to complete the Civilian Education System Advanced Course before starting the fellowship.

There will not be a **School of Choice** announcement in FY14 due to the current fiscal environment. Should a command have an urgent need to send

a high-performing workforce member to obtain his or her bachelor's or master's degree during duty time, please contact Acquisition Education and Training Branch chief Scott Greene at [scott.m.greene14.civ@mail.mil](mailto:scott.m.greene14.civ@mail.mil) to discuss possible funding from the DACM office.

For the **Acquisition Leadership Challenge Program** (ALCP), the DACM Office has split the FY14 offerings into four quarters. The announcement for Q3 will be open from Feb. 10 to March 10.

ALCP will not be announced using AAPDS. If interested, please contact your

OFFERING DATE	COURSE LEVEL	LOCATION	WHO MAY ATTEND
April 28–30	ALCP I	Aberdeen, MD	Local Workforce (WF) GS-12/13
April 30 – May 2	ALCP I	Aberdeen	Local WF GS-12/13
May 19–21	ALCP I	Atlanta, GA	All WF GS-12/13
May 21–23	ALCP II	Atlanta	All WF GS-14/15
June 9–11	ALCP I	Warren, MI	Local WF GS-12/13
June 11–13	ALCP II	Warren	Local WF GS-14/15
June 23–24	ALCP B	Huntsville, AL	Local WF GS-7 to 11
July 28–30	ALCP I	Huntsville	Local WF GS-12/13
July 30 – Aug. 1	ALCP I	Huntsville	Local WF GS-14/15
Aug. 18–20	ALCP I	Atlanta	All WF GS-12/13
Aug. 20–22	ALCP II	Atlanta	All WF GS-14/15
Aug. 25–26	ALCP B	Atlanta	All WF GS-7 to 11
Aug. 27–28	ALCP B	Atlanta	All WF GS-7 to 11

command/organization acquisition career management advocate or organizational acquisition point of contact to obtain a command allocation.

Having trouble keeping the dates straight? Announcement opening and closing dates are posted to the U.S. Army Acquisition Support Center (USAASC) Events Calendar at <http://asc.army.mil/web/events/>.

## DEFENSE ACQUISITION UNIVERSITY TRAINING

Students should continue to **apply to the FY14 DAU schedule** using the AITAS at <https://atrrs.army.mil/channels/aitas/>. Planning and applying early will afford students a better chance of obtaining a class in the time frame requested.

Encourage your supervisor to approve your training request as soon as you apply. Supervisors must approve the training request in AITAS so that the USAASC registration office can process the application. Students should view the DAU iCatalog at <http://icatalog.dau.mil> to ensure that they meet the prerequisite(s) before applying to a DAU course. Workforce members should plan their training with their supervisors to make sure they have adequate time to complete prerequisite training before attending the follow-on course. Reservations in follow-on courses are canceled if prerequisite requirements are not met.

Also, it is imperative that student and supervisor email addresses are correct in the AITAS student profile. For more information on DAU training, including systematic instructions, definition of training priorities and frequently asked questions, go to USAASC's DAU webpage at <http://>

[asc.army.mil/web/career-development/programs/defense-acquisition-university-training/](http://asc.army.mil/web/career-development/programs/defense-acquisition-university-training/).

To receive **temporary duty funding for DAU classes**, students should apply to the next class available in a cost-effective location. USAASC received reduced DAU travel funds for FY14 and, at this time, will fund only Priority 1 and 2 students for travel to cost-effective locations.

Here are some **DAU training best practices** to help students better prepare for a DAU resident course:

- Reduce the lag time between taking Part A (the online prerequisite) and Part B (resident portion).
- Review prerequisite materials before attending a follow-on resident portion.
- Review course objectives (available in the DAU iCatalog) before attending class.
- Consult with instructors before class on their recommendations to ensure success.
- Reach out to instructors and fellow students during class time for further assistance.
- Prepare by reading and having a general overview of the class materials before the beginning of each class.
- Study nightly, and review notes in the morning before class.

The **Program Manager's and Executive Program Manager's Courses**, PMT 401 and PMT 402, are required by law for program PEOs, deputy PEOs (DPEOs), program managers (PMs) and deputy program managers (DPMs) of Acquisition Category (ACAT) I and II programs. Board-selected ACAT I or II PMs should attend the course before beginning their assignment.

Course Name	Class #	Class Location	School Code	Class Start Date	Class End Date
PMT 401 (DAU)	004	KETTERING, OH	504	3/17/2014	5/23/2014
PMT 401 (DAU)	005	FORT BELVOIR, VA	508	4/21/2014	6/27/2014
PMT 401 (DAU)	006	KETTERING	504	8/18/2014	10/24/2014
PMT 401 (DAU)	007	FORT BELVOIR	508	9/8/2014	11/14/2014
PMT 402 (DAU)	003	FORT BELVOIR	508	4/28/2014	5/23/2014
PMT 402 (DAU)	004	FORT BELVOIR	508	8/4/2014	8/29/2014





PEOs, DPEOs and DPMs must complete the mandatory training within 36 months of encumbering their position.

Please work with your command and supervisor to ensure attendance in the required training. High-potential, Level III acquisition professionals (O-5 or GS-14 or above) with extensive experience in acquisition, including four years in or directly supporting a program, may participate on a space-available basis. For more information on the course, go to DAU's iCatalog at <http://icatalog.dau.mil>; to apply, use AITAS at <https://atrrs.army.mil/channels/aitas/>. The Army receives only a small allocation of seats in selected offerings;

the schedule of Army seats available for the remainder of FY14 is on Page 168.

**A weekly low-fill listing**, posted weekly at <http://icatalog.dau.mil/onlinecatalog/tabnav.aspx>, allows students the opportunity to attend classes coming up in the next 60 days. Low-fill classes are available on a first-come, first-served basis within 60 days from the start date of the class for students in Priority 2, and within 40 days for Priority 3-5 students. Even if a class is on the low-fill list, students must choose a cost-effective location.

Given fiscal constraints, DAU is looking at **alternate delivery method courses**

as an innovative way to provide the same capacity (57,000 seats) while ensuring effective learning. Alternate delivery pilots include video conferencing; telepresence using high-definition resolution; Defense Connect Online; and "flipped" classrooms, whereby students watch recordings of their professors' lectures before class and then do "homework" in class. The pilots will continue until the end of FY14, and DAU hopes to offer alternate delivery courses on the FY15 schedule.

DAU is also pursuing more pre-course requirements and video delivery of preliminary materials to reduce actual classroom time.

#### PREVIOUS **ACHIEVEMENTS**

- **2011** MarCom Platinum Award in the Magazine/Government category
- **2011** MarCom Gold Award in the Design (Print)/Magazine Cover category
- **2012** Bronze Anvil Award from the Public Relations Society of America
- **2012** APEX Award for Publication Excellence
- **2012** The Major General Keith L. Ware Public Affairs Awards, Best Magazine
- **2012** The Major General Keith L. Ware Public Affairs Awards, Best News Feature Article (Civilian)
- **2012** Secretary of the Army Awards, Editor of the Year

## CONGRATULATIONS, USAASC!

**2013 Platinum Award Winner**  
**Army AL&T Magazine**



**2013 Gold Award Winner**  
**USAASC Website**

**MARCOM**  
**AWARDS**



# ON THE MOVE



BG Jeffrey A. Gabbert

## CONGRATULATIONS TO BG GABBERT

During his promotion to brigadier general, **Jeffrey A. Gabbert**, then special assistant to the commanding general, U.S. Army Contracting Command (ACC), received his new rank insignia from his wife, Doreen, and father, Vern Gabbert. The promotion ceremony was at Redstone Arsenal, AL, Nov. 25, 2013. Gabbert subsequently assumed command of the U.S. Army Mission and Installation Contracting Command, Joint Base San Antonio – Fort Sam Houston, TX. (Photo by David San Miguel, ACC)



COL Gregory M. Fields  
(Photo by Chad Padgett, PEO C3T)

## FIELDS RETIRES AFTER 40 YEARS

**COL Gregory M. Fields**, who most recently served as Program Manager Mid-Tier Networking Vehicular Radio in PEO Command, Control and Communications – Tactical, has retired from the Army after 40 years of service.

Fields began his military career in 1973 when he enlisted as an infantryman with the 101st Airborne Division. He received his commission as a second lieutenant in the Army in 1982. Fields, who joined the U.S. Army Acquisition Corps in 1992, served in numerous acquisition assignments including Assistant Project Manager (APM) for the Sense and Destroy Armor program, APM and “trail boss” for the Force XXI Battle

Command Brigade-and-Below program, and Product Manager for Multi-Channel Satellite Terminals. Fields achieved Level III certifications in program management, information technology, systems engineering, and science and technology management.

The Army honored Fields for his career achievements during a retirement ceremony Nov. 22, 2013, at Aberdeen Proving Ground, MD, where he received numerous awards, including the Legion of Merit. “Persistence and determination throughout the acquisition process is always a winning formula for getting needed capability to the ones who protect and fight for our United States,” Fields said.





### CHANGE OF CHARTER AT ARMED SCOUT HELICOPTER

**MG William "Tim" Crosby**, Program Executive Officer Aviation, presents the charter for the Armed Scout Helicopter Directorate to **LTC(P) James R. Kennedy** during a change-of-charter ceremony Dec. 18, 2013, at Redstone Arsenal, AL. Kennedy had relinquished the charter for the Common Systems Integration Product Office, part of the Unmanned Aircraft Systems Project Management Office, just two hours previously. (U.S. Army photo by Randy Tisor, PEO Aviation Public Affairs)



### CHANGE OF CHARTER AT KIOWA WARRIOR

**LTC J.B. Worley III** accepts his charter as the new Product Manager Kiowa Warrior from **COL Robert E. Grigsby**, Project Manager Armed Scout Helicopters in PEO Aviation, during a change-of-charter ceremony Oct. 30, 2013, at Redstone Arsenal, AL. Worley assumed responsibility from **LTC(P) Mathew Hannah**, who recently assumed responsibility as the executive officer to the principal military deputy to the assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)). (Photo by Sofia Bledsoe, PEO Aviation)



### CHANGE OF CHARTER AT CSI PRODUCT OFFICE

**COL Tim Baxter** presents the charter for the Common Systems Integration (CSI) Product Office to **LTC William R. Venable** during a change-of-charter ceremony Dec. 18, 2013, at Redstone Arsenal, AL. Venable most recently served as the Office of the ASA(ALT) operations officer for the Army's Network Integration Evaluation and as trail boss for the multi-PEO, integrated tactical network fielding of Capability Set 13, while deployed in support of Operation Enduring Freedom.

## AWARDS



### AUSA AWARD FOR HUTCHISON

The Association of the United States Army (AUSA) selected **Michael R. Hutchison**, deputy to the commanding general, U.S. Army Contracting Command (ACC), to receive its 5th Region Civilian Exceptional Service Award. Hutchison's award was announced Oct. 23, 2013, at the AUSA Annual Meeting and Exposition in Washington, DC.

Hutchison was unable to attend the award ceremony but commented that he was "truly honored to receive this award because it recognizes the hard work and dedication of the ACC – Rock Island [ACC-RI] contracting center team." Reflecting on his former position as executive director of ACC-RI, IL, he said the award honors the center's "extensive work in support of operations in Southwest Asia, the Logistics Civil Augmentation Program, reachback support to troops on the ground, plus all of the ammo we bought. It also recognizes the work we did to build ACC-RI into the center it is today." (U.S. Army photo)



### TOP CIVILIAN AWARD FOR ZARDECKI

**Frank W. Zardecki**, deputy commander of Tobyhanna Army Depot (TYAD), PA, accepted the 58th Annual Distinguished Civilian Service Award during a ceremony Nov. 18, 2013, at the Pentagon. "Frank's achievements exemplify the highest standards of public service," said COL Gerhard P.R. Schröter, depot commander. "He devotes his career to individual and organizational excellence and inspires others to settle for nothing less."

The Department of Defense Distinguished Civilian Service Award is the highest honor given by the secretary of defense to a DOD career civilian. It is presented in an annual ceremony to a small number of DOD civilian employees whose service reflects exceptional devotion to duty and extremely significant contributions of a broad scope to the efficiency, economy or improvement in the operation of the department. (Photo by Steve Grzedzinski, TYAD)



### LEGION OF MERIT FOR SMITH

CW4 Robert J. Smith III, receives the Legion of Merit from COL James Brashear during Smith's retirement ceremony Oct. 15, 2013, at Redstone Arsenal, AL. Brashear, Project Manager Non-Standard Rotary Wing Aircraft at PEO Aviation, recognized Smith's accomplishments and 22 years of service to the country. "You don't get to the ranks of W4 unless you're a quality person," said Brashear. Smith joined the Army in January 1992 and served in multiple technical roles, including as a maintenance test pilot and flight examiner. He had multiple combat deployments, flying more than 3,000 flight hours during his service. During the retirement ceremony, Smith also received the Honorable Order of Saint Michael Bronze Award from the Army Aviation Association of America, a letter from now-retired GEN James D. Thurman, then commander of the United Nations Command/Combined Forces Command/United States Forces Korea, and a flag that was flown in Afghanistan. Smith's wife, Brandy, received a certificate of appreciation from Army Chief of Staff GEN Raymond T. Odierno. (Photo by Sofia Bledsoe, PEO Aviation)

### TURNING POINTS

**LTG Kathleen M. Gainey** retired after more than 35 years of service to the Army, culminating in her assignment as the deputy commander, U.S. Transportation Command, Scott Air Force Base, IL.

**LTG Susan S. Lawrence** retired after more than 34 years of service to the Army, culminating in her assignment as the chief information officer/G-6, Office of the Secretary of the Army, Washington, DC.

**MG Michael J. Walsh** retired after more than 36 years of service to the Army, culminating in his assignment as the deputy commanding general for civil and emergency operations, U.S. Army Corps of Engineers, Washington, DC.

### FIRST STAR FOR MITCHELL

On Dec. 20, 2013, the Senate approved the nomination of **COL Daniel G.**

**Mitchell** for appointment to the rank of brigadier general. Mitchell is currently serving as deputy commander, U.S. Army Sustainment Command, Rock Island Arsenal, IL.

### OFFICER ASSIGNMENTS

Army Chief of Staff **GEN Raymond T. Odierno** announced the following officer assignments:

**MG Harold J. Greene**, deputy for acquisition and systems management, Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology (OASA(ALT)), Washington, DC, to deputy commanding general, Combined Security Transition Command – Afghanistan, Operation Enduring Freedom, Afghanistan.

**BG Kirk F. Vollmecke**, commanding general, U.S. Army Mission and

Installation Contracting Command, TX, Joint Base San Antonio – Fort Sam Houston, TX, to deputy for acquisition and systems management, OASA(ALT), Washington.

**COL(P) Robert L. Marion**, assistant deputy for acquisition and systems management, OASA(ALT), Washington, DC, to Program Executive Officer Aviation, Redstone Arsenal, AL, succeeding **MG William "Tim" Crosby**, who is retiring.

### GODDETTE TO SOLDIER

The Office of the Secretary of the Army Civilian Senior Leader Management Office announced that **Timothy G. Goddette** has been detailed to the position of Deputy Program Executive Officer Soldier, Fort Belvoir, VA, effective Jan. 26.



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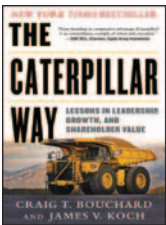


## OFF THE SHELF

### RECOMMENDED READING LIST

Army leaders have always encouraged their Soldiers to read. Even—and especially—in this age of information overload, the pursuit of knowledge through books is essential to develop a fuller understanding of acquisition, logistics and technology. In the words of Chief of Staff of the Army GEN Raymond T. Odierno, “We can never spend too much time reading and

thinking about the Army profession and its interaction with the world at large. ... There is simply no better way to prepare for the future than a disciplined, focused commitment to a personal course of reading, study, thought and reflection.” On that note, we publish “Off the Shelf” as a regular feature to bring you recommended reading from Army AL&T professionals.

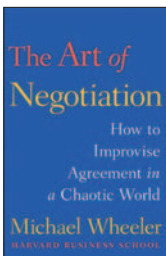


#### **THE CATERPILLAR WAY: LESSONS IN LEADERSHIP, GROWTH, AND SHAREHOLDER VALUE**

by Craig T. Bouchard and James V. Koch

(New York, NY: McGraw-Hill, 2013, 368 pages)

In the early 1980s, Caterpillar Inc. lost \$1 million per day for three consecutive years. Its continuing existence came into question. Today, “CAT” is the world’s most profitable manufacturer of construction and mining equipment and large engines. Among Caterpillar’s accomplishments was its rapid adoption of the Six Sigma manufacturing approach. Senior management at CAT helped Bouchard, an investor and businessman, and Koch, board of visitors professor of economics and president emeritus at Old Dominion University, to arrange a yearlong odyssey through the hallways and history of the construction industry giant. Their book takes you behind the scenes with the CEOs, executive vice presidents, managers, dealers, customers, union bosses and Wall Street analysts who were players in Caterpillar’s drive to global dominance. “The Caterpillar Way” shows how the company’s emphasis on core values edged up its margins even through difficult times.

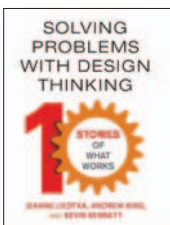


#### **THE ART OF NEGOTIATION: HOW TO IMPROVISE AGREEMENT IN A CHAOTIC WORLD**

by Michael Wheeler

(New York, NY: Simon & Schuster, 2013, 320 pages)

“The Art of Negotiation” offers a new and powerful way to analyze and manage the process of negotiation. For many years, two approaches have prevailed: the “win-win” method exemplified in “Getting to Yes” by Roger Fisher, William Ury and Bruce Patton; and the hard-bargaining style of Herb Cohen’s “You Can Negotiate Anything.” Wheeler, an award-winning Harvard Business School professor, provides a dynamic alternative to one-size-fits-all strategies that don’t match real-world realities. His book shows how master negotiators thrive in the face of chaos and uncertainty. They don’t trap themselves with rigid plans; instead they understand negotiation as a process of exploration that demands ongoing learning, adapting and influencing. This agility enables them to reach agreement when others would be stuck in a stalemate.



#### **SOLVING PROBLEMS WITH DESIGN THINKING: TEN STORIES OF WHAT WORKS**

by Jeanne Liedtka, Andrew King and Kevin Bennett

(New York, NY: Columbia Business School Publishing, 2013, 232 pages)

There’s more than one way to look at a problem. “Design thinking” aims to do it from the perspective of the problem’s context, creativity in the solution, and realism or rationality in fitting the solution to real-world conditions; a solution that works in the Sahara might not work in the Amazon. Design-oriented firms such as Apple Inc. and Ideo have demonstrated how design thinking can affect business results. However, most managers lack a sense of how to use this new approach for issues other than product development and sales growth. “Solving Problems” gives 10 detailed examples of managers who successfully produced innovative solutions to such problems as implementing strategy, supporting a sales force, redesigning internal processes, feeding the elderly and engaging citizens. Companies



profiled include 3M Co., Toyota Motor Corp., IBM, Intuit Inc. and SAP AG, as well as entrepreneurial startups such as MeYou Health; and government and social-sector organizations, including the City of Dublin and Denmark's The Good Kitchen.



## **DARING GREATLY: HOW THE COURAGE TO BE VULNERABLE TRANSFORMS THE WAY WE LIVE, LOVE, PARENT, AND LEAD**

by Brené Brown

(New York, NY: Gotham Books, 2012, 256 pages)

To be daring is to risk being vulnerable and to open up the possibility of failure, whether the realm is investing, leadership, creative processes, human relationships or some other area. In "Daring Greatly," Brown, a research professor at the University of Houston's Graduate College of Social Work, challenges what we think we know about vulnerability. (To see her TED Talk on the topic, go to [http://www.ted.com/talks/brene\\_brown\\_on\\_vulnerability.html](http://www.ted.com/talks/brene_brown_on_vulnerability.html).) Based on 12 years of research, this best-selling book argues that vulnerability is not weakness, but the clearest path to courage, engagement and meaningful connection.



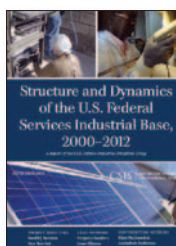
## **THE GOAL: A PROCESS OF ONGOING IMPROVEMENT**

by Eliyahu M. Goldratt and Jeff Cox; 25th anniversary revised edition

(New York, NY: North River Press, 2012, 408 pages)

A business book disguised as a novel, a love story about the manufacturing process and an exhilarating adventure in human potential, "The Goal" has been changing how America does business for more than 25 years. First published in 1984, again in 1994 and 2004 and revised again for 2012, it began as an underground best-seller. Today the book is a fixture in thousands of companies and hundreds of business schools, and is one of the three books Amazon CEO Jeff Bezos recently required top executives to read.

This 25th anniversary edition, revised with the help of freelance writer and journalist Cox, includes the late Goldratt's personal story, "My Saga." It also includes case study interviews that David Whitford, editor at large with Fortune Small Business, conducted with Goldratt and with business professionals from General Motors Co., Thomson-Shore Inc., Security Federal Corp. and others who put the principles of "The Goal" into action.



## **STRUCTURE AND DYNAMICS OF THE U.S. FEDERAL SERVICES INDUSTRIAL BASE, 2000-2012 (CSIS REPORTS)**

by Gregory Sanders and Jesse Ellman

(Lanham, MD: Center for Strategic & International Studies/Rowman & Littlefield, 2013, 98 pages)

In a time of austerity, the U.S. government's reliance on the private sector for a variety of services has declined for two consecutive years. Even so, real services contract spending in 2012 remained more than 80 percent above the 2000 level. The CSIS Defense-Industrial Initiatives Group brings eight years of experience to the task of understanding this industry in flux. This report examines contracting factors such as competition, funding mechanisms and vehicles, while also looking at industrial base factors such as vendor market share by size and top contractors by total services revenue. The study team then applies this analysis to individual government customers and service areas. The 2000-2012 iteration of the report also significantly updates the chapter on policy implications, which examines the controversial topics of contract size and multi-award contracts to determine what the data say about their ramifications.

*A wealth of suggested reading titles can be found in GEN Odierno's professional reading list, online at <http://www.history.army.mil/html/books/105/105-1-1/index.html>. Is there a book you'd like to recommend for this column? Send us an email at [armyalt@gmail.com](mailto:armyalt@gmail.com). Please include your name and daytime contact information.*

# THEN & NOW

## 1977 & 2013



### THE 'FIFTH SERVICE'

"The more things change, the more they stay the same" is an old proverb asserting that superficial changes over time do not alter basic realities. Case in point: the continuing debate about America's industrial base. How much is enough? What can we afford to "lose"? What sorts of risk can we afford to take? Read the following paragraphs and ask yourself how long ago the chief of staff of the Army spoke these words—10 days, or decades?

"In the spring of 1950, Congress could not find \$13 billion for defense. But when our interests were threatened in Korea, that same Congress found \$50 billion for it.

"So we see these traditional thought patterns at work today in some areas: new isolationism, idealism, especially strong antimilitarization, which I believe is waning but still powerful, and materialism, 'what's in it for us?'"

This means no longer do we have the time to mobilize the forces in the industrial base and we just have to be ready now. We must be prepared to fight and win with forces, equipment and material that we have on hand at any moment in time."

The year was 1977. In the wake of the Vietnam War, Army Chief of Staff GEN Bernard W. Rogers saw the need for the Army to remain prepared. His remarks appeared in the May-July 1977 issue of

Army Research and Development magazine, now Army AL&T.

Nearly two decades later, in the January-February 1994 edition, LTG Lawrence F. Skibbie (USA, Ret.) referred to the defense industrial base as a "fifth service" supporting a high-tech, well-armed military. He wrote: "With these awesome arms has necessarily come a specialized, high technology defense industry that is dramatically different from the converted automobile and refrigerator factories that churned out quantities of weapons in World War II and the Korean conflict."

Two decades on, the Army's 2013 Strategic Planning Guidance makes clear the need to maintain the industrial base.

### VALUED EXPERTISE

The Army uses skills and capabilities for which it may be the only customer, such as those of JP Plowden, who has nearly 30 years of experience. Here, Plowden works on a 120 mm mortar base plate at Watervliet Arsenal, NY. (Photo by John B. Snyder)



"The Army must preserve options for the future by retaining the capacity to expand and provide the capabilities needed for future challenges. Investment in regeneration includes a coherent strategy across all Army functions, including ... maintaining an industrial base capable of providing quality material to meet future threats," the guidance states.

Rogers' statement that "no longer do we have the time to mobilize the forces in the industrial base" is no less true today than it was nearly 40 years ago. It is probably even more important than it was then, given the growth of technology and the military's dependence on niche technologies for which the government may be the only customer.



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“The organic industrial base provides a tremendous capability to be able to surge to meet future requirements. Our challenge ... is how do we sustain ... the skill sets and capabilities to support the surge for the future?”

**GEN Dennis L. Via**  
*Commanding General,  
U.S. Army Materiel Command*

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