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ARMY AL&T

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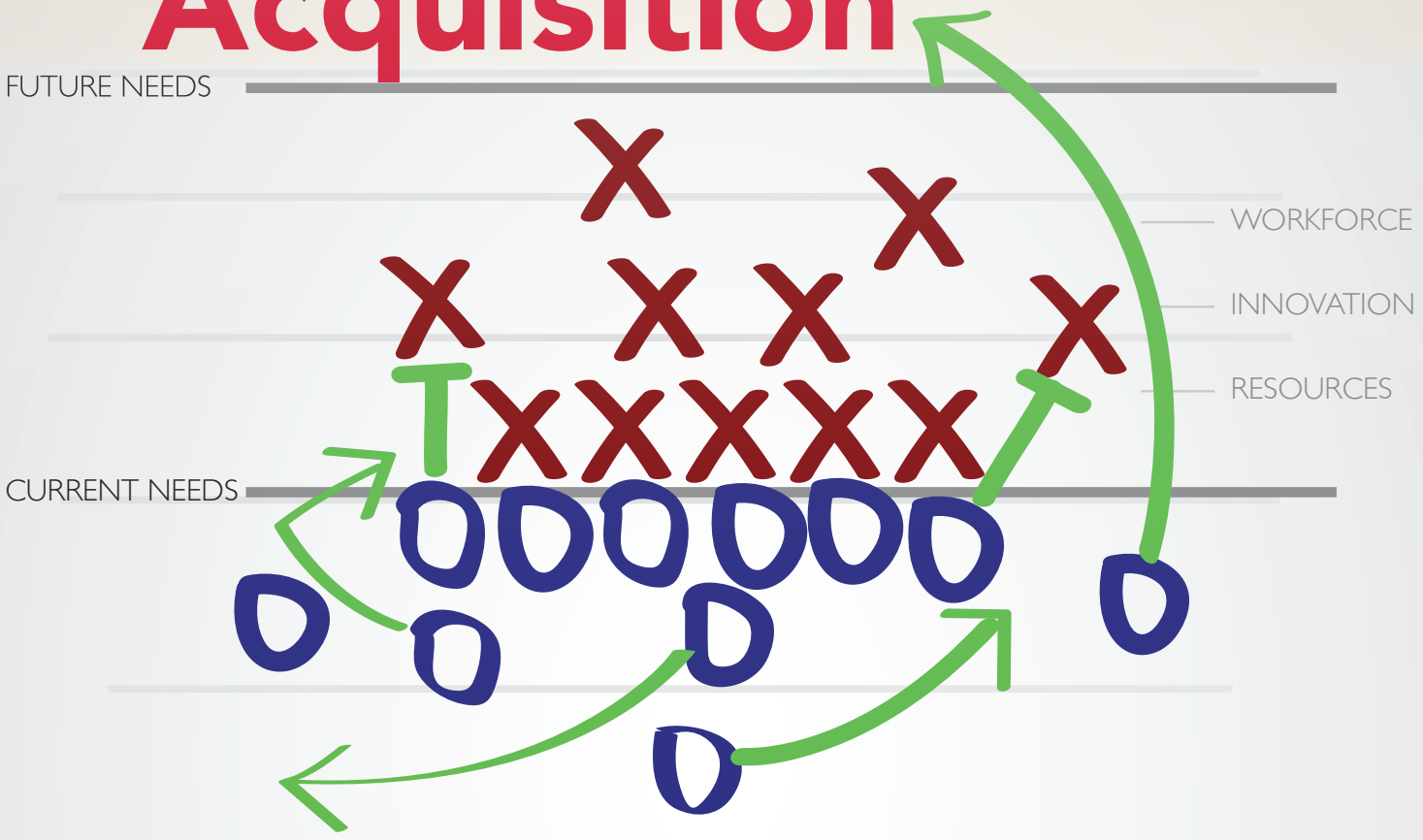
JANUARY-MARCH 2017

Strategic Acquisition



RECALIBRATING REQUIREMENTS

ARCIC looking for ways to thaw the glacial pace of acquisition

SPEED AND URGENCY

BMNT works to construct a bridge between DOD and Silicon Valley

A NEW DIMENSION OF ACQUISITION

RDECOM explores broader use of 3-D printing to meet Soldiers' needs

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ARMY AL&T

JANUARY-MARCH 2017

FEATURES

ON THE COVER
For an acquisition team to tackle its goals requires a strategy to close the gap between current and future needs by lining up the best possible workforce, innovation and resources.

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ARMY AL&T

JANUARY-MARCH 2017

FEATURES

LOGISTICS

SCIENCE & TECHNOLOGY

CONTRACTING

? CRITICAL THINKING

COMMENTARY

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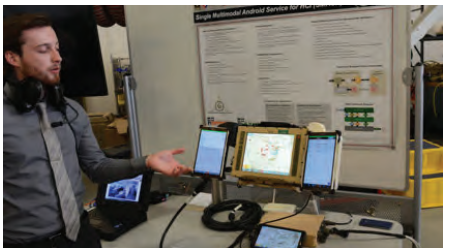
DAU SENIOR SERVICE COLLEGE FELLOWS COMPLETE PROGRAM MANAGER'S COURSE

By Kristine Faria



ARMY RESEARCH CENTER'S TEAM TO ADVANCE MISSION COMMAND CAPABILITIES

By Kathryn Bailey

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From the Army DACM Office

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'I thought I had died and gone to heaven'

By Susan L. Follett

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That plus sign means there's more! More information, that is. There's only so much room between the front and back covers of Army AL&T, and that's why even die-hard readers of the hard-copy magazine will want to check out the electronic extras available on the app and online version of Army AL&T.

Go to **http://usaasc.armyalt.com/** or use the iOS or Android app and look for the + icon to find additional content available online.

Read Army Chief of Staff Gen. Mark A. Milley's initiatives to speed the acquisition process in "**RECALIBRATING REQUIREMENTS**."

Read how the Program Executive Office for Ammunition's Product Manager Gator Landmine Replacement shapes the terrain in "**A NEW WAY OF THINKING**."

Read more about the new acquisition lessons learned portal from "**JUST CAALL**."

Watch the final presentations of Stanford University's Spring 2016 pilot class of "**HACKING FOR DEFENSE**."

Read the Defense Innovation Unit Experimental guide to using commercial solutions opening and other transaction authority from "**SPEED CONTRACTING**."

Get a fresh take on analyses of alternatives from "**RETHINKING THE ANALYSIS**."

View more photos of the award winners highlighted in "**RECOGNIZING ARMY ACQUISITION ACHIEVEMENT**."

Click on the icon wherever you see it in the issue to see more photos and read additional articles.

From the Editor-in-Chief

@ Email Nelson McCouch III
ArmyALT@gmail.com

TALK BACK

Let us know how well we are meeting your needs. Send an email to **ArmyALT@gmail.com**.

For more news, information and articles, please go to the USAASC website at **http://asc.army.mil**. Click on the Publications tab at the top of the page.

Sometimes the themes for Army AL&T magazine are so conceptual that it is up to my marvelous editorial staff to interpret the ideas from the magazine's Editorial Advisory Board and pass that guidance on to you, our readers and contributors, in an effort not to end up with 160 blank pages. This is one of those issue themes: strategic acquisition.

"What's that?" you say. "We've done agile acquisition, acquisition reform, innovative approaches to acquisition, etc., but never strategic acquisition. So, what's different?"

You can slice and dice acquisition in myriad ways. While past issues of Army AL&T have looked at a specific aspect of acquisition, this issue focuses on acquisition holistically, at least in part because that's something that almost never happens in DOD. Start with a greater vision of what the final product will be and how best to alter, reconfigure, modify and even recycle it with the desired end in mind—thinking from "lust to dust," as the former Army Acquisition Executive, the Hon. Katrina McFarland, has said. Infuse that mindset into each step along the way, and you have strategic acquisition.

Think of strategic acquisition like a B-52 Stratofortress (pundits, take a breath): The bomber is still in service 62 years since the original aircraft flew on Aug. 5, 1954, having been modified over the years to carry more weight with upgraded engines, different munitions (conventional, cruise missiles, nukes, etc.) and photoreconnaissance or electronic capsules in the bomb bays, and upgraded with an advanced communications system. But at the end of the day, it's the same platform as the original—reconfigured, modified and reimagined for use beyond 2040, according to Boeing. That's a strategic bomber, but not a strategic acquisition.

Now imagine trying to envision all of what we have asked the B-52 to do—and how, eventually, to retire it—when it was nothing but a gleam in the Air Force's eye. But that was in a different era of acquisition, when the enemy was clear and funding was plentiful. The point is that not only does the U.S. military have to engineer the widget (our favorite abstraction for a product), but in the ideal world of acquisition, it must also engineer the acquisition itself.

So, now that budgets are tight, materials expensive and acquisition timelines simply too long, the Army Acquisition Workforce is being asked to do more than just make the widget. Now the acquisition mission is to think of the widget holistically—the multitude of processes, procedures, materials and uses that widget might have—and to create it to be more sustainable and scalable, use more open standards, and be interoperable and more compatible with other, as-yet unidentified widgets that will meet future needs.

So, at least until President Obama's signing of the National Defense Authorization Act for Fiscal Year 2017 into law on Dec. 23, less significant acquisition reform—which many doubt can work—has had to come from those who know acquisition best. That is exactly what the Army Acquisition Workforce is working to accomplish, with the help of industry, academia and other stakeholders.

Take a look at our "Critical Thinking" interview with Col. Peter Newell (USA, Ret.), who used to run the Rapid Equipping Force, and Jackie Space—managing partner and partner, respectively, of a company called BMNT Partners LLC—to learn what someone who knows how to get things done in acquisition thinks of the traditional acquisition process. Or take a look at "Recalibrating Requirements," in which we learn how the folks at the Army Capabilities Integration Center are taking multiple paths to reform the requirements generation process at the core of acquisition, because sometimes the widget is something simple—like a new boot, not a B-52—or something that industry may already have.

Speaking of keeping products useful well into the future, Army AL&T recently conducted its biennial readership survey, and the results are in. (See "The Long and Short of It," Page 11.) The survey helps us continuously improve the magazine—your magazine—to meet current and future needs of the Army Acquisition Workforce. We use your comments, along with a commercial review of best magazine business practices, to ensure that Army AL&T continues to be a viable product well into the 21st century. If you have comments or missed the survey, please contact the magazine at **ArmyALT@gmail.com**. We'll be happy to consider your recommendations.

Nelson McCouch III
Editor-in-Chief

BRINGING THE THREAT HOME

Soldiers assigned to the 1st Cavalry Division search for enemy fighters during a clearance operation in a mock town at the National Training Center, Fort Irwin, California, in February 2016. Emerging threats and changing environments in which the Army will be called on to operate require continued improvement of acquisition processes, all of which feed into tough, realistic training to prepare Soldiers for combat. (U.S. Army photo by Staff Sgt. Alex Manne, 982nd Combat Camera Company Airborne)

FROM THE ARMY
ACQUISITION EXECUTIVE
MS. STEFFANIE B. EASTER

The CHALLENGES *Of* CHANGE

Army acquisition is advancing from reform to strategic thinking

The ancient Greek philosopher Heraclitus wrote that the "only constant is change," a phrase that resonates with me today as our Army navigates ongoing changes to meet future challenges. The most visible changes are generally the most superficial, while it takes time for the effects of longer-term, more impactful changes to become apparent. As the senior official performing the duties of the assistant secretary of the Army for acquisition, logistics and technology, I reflect upon the more sustained, underlying changes that face Army acquisition. More than new leadership and strategies, the emerging threats and changing environments in which our Army will operate require proportional adjustments and continued improvement of the acquisition process.

The Army's emphasis through acquisition reform has been, and continues to be, equipping the most formidable ground combat force on Earth at the best value to the taxpayer. Acquisition reform as an iterative process began decades ago, but the renewed emphasis Army senior leadership has placed on improving efficiencies, responsiveness and timeliness already has produced significant, measurable results.

For example, the Joint Light Tactical Vehicle (JLTV) program led by the Army is on track to close a critical capability gap for Soldiers and Marines, having delivered

A MANDATE TO EXPERIMENT

Arkansas Army National Guard Soldiers operate a Heavy Expanded Mobility Tactical Truck on their first day of simulated combat operations at the National Training Center in August 2015. The 12-day field training exercise, involving more than 5,200 Soldiers from National Guard, U.S. Army Reserve and active-duty Army units, is one example of the experimentation that the Army needs more of to develop and deliver technologies more rapidly to address current threats and shape smarter procurement strategies for the future. (Photo by Spc. Michael Germundson, 115th Mobile Public Affairs Detachment)

the first production vehicle below cost and ahead of schedule in October 2016. The first vehicles will help reduce future production risk and serve as performance and operational test program assets to verify that requirements are met in the areas of reliability, transportability, survivability and networking. Thanks to outstanding program management, we expect to deliver all 49,099 Army JLTVs by the mid-2030s instead of the early 2040s, at roughly 15 percent less than planned—nearly $6 billion in savings—giving Soldiers and Marines much-needed capability and returning badly needed resources to invest in other modernization priorities.

Strategic acquisition looks to meet the threats of today, tomorrow and the future with a more holistic approach across the acquisition life cycle and the entire Army enterprise. The question to ask ourselves is, how do we create scalable sustainment, a flexible procurement system that successfully manages the infrastructure? We must think beyond fielding capability as the end goal—with roughly 70 percent of program costs then going into sustainment—and consider how the program may be recombined, repurposed or salvaged to benefit future systems. The Army must think in terms broader than divestiture or demilitarization—as with the procurement strategy for the M109A7 Self-Propelled Howitzer, which combines M109A6 turrets and a Bradley Fighting Vehicle system chassis.

WHAT IS 'STRATEGIC ACQUISITION'?

In the broadest context, "strategy" means examining the status quo, measuring the gap between that and the desired end state, and identifying the path to achieve that goal. "Strategic acquisition," then, leads us to embrace the changes of acquisition reform and continue to build toward the most affordable and efficient processes to field capability. It is the business of making acquisition more efficient, more economical and more sensible.

Thanks to congressional advocacy, Army acquisition reform efforts in the 2016 National Defense Authorization Act provide warfighters with the best equipment when they need it. In

LONG-RANGE IMPACT

The M109A7 Paladin, the latest generation of self-propelled howitzers, undergoes extensive trials at the U.S. Army Cold Regions Test Center in Alaska, an element of the U.S. Army Test and Evaluation Command (ATEC). The Army's procurement strategy for the M109A7 exemplifies the current shift toward thinking in terms broader than divestiture or demilitarization, by combining M109A6 turrets and a Bradley Fighting Vehicle system chassis to provide advanced capability while repurposing materials to save program costs. (Photo by Sebastian Saarloos, ATEC)

a practical sense, a shared theme of acquisition reform and strategic acquisition is involvement of the highest levels of Army senior leadership earlier and more frequently to make informed decisions within the strategic framework, especially for rapid acquisitions and major defense acquisition programs.

To facilitate acquisition reform, the Army announced the establishment of the Rapid Capabilities Office in August 2016 to take measured risks, experiment, evolve and deliver technologies in real time to address current threats, and to shape smarter procurement strategies for the future. The Rapid Capabilities Office receives direct input from the secretary of the Army and the Army chief of staff (CSA) and is focused on the Army's highest priorities, with an intent to deliver an operational effect within one to five years.

This timeline fills a gap we previously had in Army acquisition. It hits the "sweet spot" between the Army Rapid Equipping Force (which delivers capabilities in 180 days or less) and programs of record (which usually take five or more years to reach maturity). The Rapid Capabilities Office pulls forward and expedites emerging capabilities that otherwise would not be fielded until FY20 or FY21.

The Rapid Capabilities Office is a key component of acquisition reform and one of the solutions to reshaping Army acquisition overall. The office takes a strategic posture, prototyping and combining capabilities in innovative ways, and delivering interim solutions that will make a difference in the field as soon as possible—while helping the Army make smarter acquisition decisions for our programs over the long term.

HIGHER VISIBILITY

The reinvigorated Army Requirements Oversight Council (AROC) similarly introduces Army senior leadership directly into the acquisition process for major defense programs. Chaired by the CSA and facilitated by the Army's

ASSESSING THE FUTURE

Spc. Colby J. McAdams of the 734th Ordnance Company controls an Andros FX robot using a Xbox 360 controller during the Brigade Modernization Command's Army Warfighting Assessment (AWA) 17.1 in October 2016 at Fort Bliss, Texas. The AWA, distinct from the continuing series of network integration evaluations (NIEs) that began in 2011, is geared to explore the "realm of the possible" by evaluating potential interim solutions to Army Warfighting Challenges—new ideas not just in technology but also in tactics and concepts—in operationally relevant and rigorous scenarios. (Photo by Staff Sgt. Cashmere Jefferson, 7th Mobile Public Affairs Detachment)

deputy chief of staff, G-8, the AROC drives acquisition decisions over the life cycle of a program. The AROC convenes regularly on Army programs to ensure that acquisition, requirements, resourcing and test entities are all linked on our developmental programs. This process provides the opportunity to conduct strategic trades across cost, schedule and performance based on available resources.

For the past four years, the long-range investment requirements analysis (LIRA) has been the Army's process to project over a 30-year period the implications of decisions made in the program objective memorandum (POM). The LIRA looked further out into the future than the five years of the POM to project future issues and decision points and begin to influence them today. The capability portfolio review (CPR) process took a more focused look at a narrow set of capabilities and requirements.

This year we replaced both the LIRA and CPR processes with the strategic portfolio analysis review (SPAR). With SPAR, we are taking the next step in long-range planning by building upon lessons learned from the LIRA and CPRs. The SPAR process injects senior leader guidance earlier and more often, and will help us make better-informed decisions on how to build the future Army. (See "Deter and Defeat," Page 18.)

CONCLUSION

As CSA Gen. Mark A. Milley discussed recently, rapid mobilization at the start of wars has worked, but only at great expense. It takes years to effectively regenerate the formidably trained and equipped ground fighting force that the United States possesses today. Being strategic in our acquisition decisions and focusing on modernizing the Army will preemptively close the gap to maintain overmatch against potential adversaries who are developing capabilities designed to exploit our vulnerabilities.

We can impact the Army's future by:

- Ensuring that we enable our acquisition workforce to acquire relevant capabilities.
- Informing new concepts and prototypes that are enabled by advancements in technology.
- Developing enhancements or upgrades to increase capability while preserving existing investments.
- Employing innovative techniques to improve logistics and sustainment efforts.
- Investing in research that will enable new capabilities and create the opportunity for a next generation of concepts.

I want to take this opportunity to challenge you. We look to the future to build on the Army's great counterinsurgency and counterterrorism efforts, yet remain vigilant in areas where our adversaries are accelerating and developing their own enhanced overmatch capabilities. We do not want to acquire or become tied to the technology used to fight the last war; rather, we must look to the future and prepare to fight the next one. We need to continue to strive for excellence in our products and our processes.

As Jean-Baptiste Alphonse Karr observed, "The more things change, the more they stay the same." While the faces of leadership, theaters of conflict and adversaries are ever-changing, the underlying strength of the Army acquisition enterprise remains unchanged. Our people remain steadfast in their dedication to mission, and our priority remains resolute: to never send American Soldiers into a fair fight.

THE LONG *and* SHORT OF IT

Respondents to Army AL&T magazine's biennial survey of its readers were thoughtful and incisive, and provided much food for thought for the magazine's staff. (And, oh, by the way, can we make the articles shorter?) If you're a member of the Army Acquisition Workforce and are reading this magazine for the first time, maybe one of us isn't doing their job. We need to know if it's us.

by Mr. Steve Stark

(Image by USAASC/PixelEmbargo/iStock)

We asked you to be honest with us about Army AL&T magazine in our recent reader survey, and those of you who responded were by turns insightful, silly, irritated, full of suggestions and completely unaware of Army AL&T's existence. We tend to find little value in responses to "How are we doing?" such as "great" or "horrible." The responses we value most are those that provide us with constructive criticism and give us insight into how you use the magazine and how it may better serve your needs.

Some gems from the 2016 survey:

- One reader wanted to see more on "rain forest depletion."
- An irritated but polite respondent said, "Please allow an opt out for those who do not like getting tier [sic] inbox clogged with frivolous emails. Thank you."
- Another helpfully opined, "I have never read an article from your magazine but considering its [sic] 'Army' I highly doubt anything is credible."
- One, perhaps a staff member, wrote: "Tough, hard charging, born in the crucible of battle and tempered in the fires of combat, Army AL&T is there, shoulder to shoulder acting as a force multiplier for the Acquisition Workforce." Yup. Funny. Good writing, though.

The vast majority of our respondents, however, took the biennial survey seriously and in the spirit in which it was meant: It's part of our continuing mission to improve the magazine, and we take seriously every comment we get. Even if, like those above, they appear to be frivolous, they tell us something about our readers—or those who have access to the magazine and are not yet readers.

ANONYMITY'S COSTS AND BENEFITS

Our surveys are always anonymous. The only identifying information we get is what respondents choose to provide. We operate the survey this way because we believe that Army AL&T's audience deserves the chance to speak openly and be brutally honest about what it likes and doesn't like. Seldom are respondents brutal. But sometimes respondents are so thoughtful that we wish we could reach out and say, "Tell me more."

That is the drawback of an anonymous survey: When someone makes what we think is a great suggestion, we have no idea who they are. For example, in this year's survey we had a request for articles on facilities engineering. We'd love to do that. When we think about the installations the Army has all over the world, from hospitals to dining facilities to landing strips, we want to hear about those—how they're created, what the pitfalls are, where and how fascinating solutions to seemingly intractable problems have emerged. If the respondent who provided that observation happened to be knowledgeable about the topic, we'd most certainly reach out to talk about writing an article. Unfortunately, we can't do that. But the respondent is welcome to get in touch.

Another respondent wondered why we don't have letters to the editor. The answer, actually, is that we do receive them. This is, however, another angle on anonymity.

Our audience tends to be cautious or risk-averse. So it will surprise no one that even though the letters we receive have been thoughtful, articulate and incisive about articles that the writer sees as a poor representation of how the Army does or does not do something, the letter writer in every recent case has requested anonymity, for fear of an adverse effect on his or her job prospects or perhaps fear of retribution. Whether that fear is justified

Survey Results

Goal: Assess Army AL&T magazine's level of success in meeting its stated mission, which includes:

- Providing members of the Army acquisition, logistics and technology (AL&T) community timely and actionable news, best practices and commentary about AL&T processes, procedures, techniques and management philosophy.
- Disseminating information pertinent to the professional development of workforce members and others engaged in AL&T activities.

73%
AGREE that Army AL&T magazine provides timely and actionable news, best practices and commentary to the Army AL&T community, instructing and informing about AL&T processes, procedures, techniques and management philosophy.

80%
View the magazine as HIGHLY CREDIBLE.

Top useful and interesting categories by highest percentage of respondents.

Interesting

65% Acquisition
64% Science and technology
59% Human interest stories
59% Then and Now
55% Critical Thinking

Useful

59% Contracting
58% Acquisition
40% Logistics
37% Technically Speaking
37% Then and Now

is a question only that person can answer. The reason we don't publish letters to the editor anonymously is that we believe our contributors, having put themselves and their reputations on the line, deserve an open and honest dialogue. If you're willing to take part in that dialogue and let us publish your name, we'd love to hear from you!

We also do not publish articles anonymously, nor will you see such staples of investigative journalism as, "said a senior Army official on condition of anonymity." Army AL&T is not an investigative publication; it's a trade journal devoted to the crafts of Army acquisition, logistics and technology. It's also a dialogue among stakeholders, leaders and the workforce.

That gets to a fundamental aspect of Army AL&T magazine—one we'd like to see change—we'd like to see this magazine be a place where discussions about potential hot-button issues can freely unfold. Indeed, the Hon. Katrina McFarland said, in our last Editorial Advisory Board meeting, that she'd like to see more lightning in the magazine. At the moment, that's not the kind of contributions that Army AL&T gets. That could change.

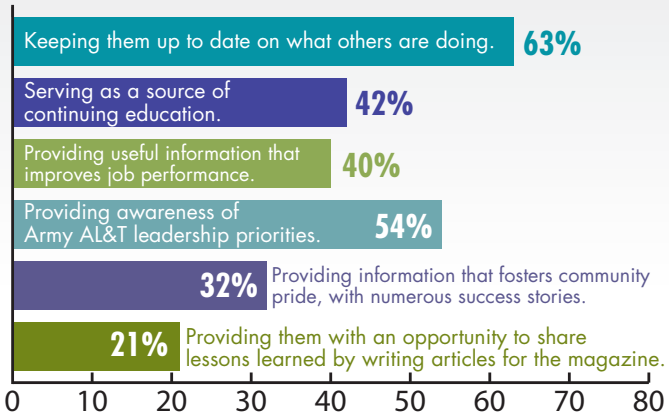
AN UNUSUAL MAGAZINE

Army AL&T magazine is the trade journal of the Army Acquisition Workforce. Our writ is to provide news on best practices, lessons learned, career developments and useful commentary—content that helps the workforce do its job better.

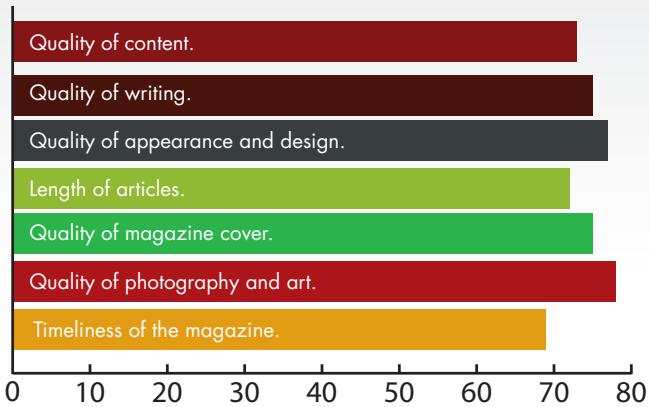
Army AL&T magazine is unusual in that virtually all of our contributors are not professional writers. We don't have a staff of reporters or staff writers or contributing editors—with beats in acquisition, science and technology, logistics, contracting and so forth—who fan out across the acquisition enterprise and hunt for articles to pitch to their editors. We do have some savvy public affairs officers who know journalism and effectively promote their commands' interests in these pages. We depend on them nearly as much as we depend on our staff.

Mostly, we have an array of subject matter experts who feel passionately about what they do and about the Soldiers they do it for. They want to share their experiences with others in the same profession so that we can all do a better job. We have

Army AL&T magazine strengthens readers' connection to the workforce by:



Evaluation of magazine quality in the following areas (Percentage of respondents that marked outstanding or good):



Goals:

Determine who readers are and how they read our magazine.

Measure the magazine's success in presenting content in the most accessible way possible.

27%
Prefer the PRINT version [only] of the magazine.

46%
Prefer the DIGITAL version of the magazine.

5%
Prefer the MOBILE APP version of the magazine.

22%
Prefer the PRINT AND DIGITAL versions of the magazine.

69%
Rank the overall quality of the print magazine outstanding or good.

71%
Rank the overall quality of the e-magazine outstanding or good.

37%
Rank the overall quality of the mobile app outstanding or good.

Who reads Army AL&T?

6% Contractor or other
6% Military
88% Civilian

89%
Are members of the Army Acquisition Workforce

Highest acquisition career field percentages

17% Project management
18% Engineering
22% Life cycle logistics
23% Contracting

430 readers responded to questions.

a small staff of extremely dedicated editors who are professionals and do their best to make the articles we receive as thoroughgoing and authoritative as possible. This unusual state of affairs has been the case for more than 50 years.

More than anyone else, we understand that the content we provide is not perfect. One respondent said, "This publication leaves out all of the actual problems with the program. It is not realistic [nor does it] reflect the problems within equipment in the field." The fact is, we would welcome a bit more "controversy" in our pages. We'd love to have contributions from the operational perspective, but we don't get anywhere as close to as many as we'd like. When we see opportunities that we can realistically chase—given our small staff—we go after them. (Take, for example, the gem of an operational commentary, "Rule No. 1," Page 128.)

WHAT ARMY AL&T IS NOT

In the abstract, controversy is simple enough, especially with social media: Say something explosive and watch it blow up. We see it all the time. But there is a very real difference between controversy for controversy's sake (click bait) and controversy that consists of honest and thoughtful disagreement between respectful people who just don't see eye to eye. Most of the time, though, you won't find much controversy in this magazine because there's a very real hesitation on the part of the Army acquisition, logistics and technology community to point out the negative. We understand that and try to work around it.

Also, there are some things we don't cover because they don't fall within our charter. One respondent wanted to read more about the history of Cold War veterans. Unless we had an article that was germane to some area of acquisition by or about Cold War veterans, we wouldn't run it, as interesting as it might be, even if it were prizeworthy writing. We have a very specific mandate.

WHAT YOU ARE GOING TO SEE

Another respondent asked about follow-ups to articles we've published in the past. This is something we're working on. We, too, think it's important not to just put stuff out there and leave it. We do want to know "the rest of the story," as that respondent put it.

One of the most common issues among our respondents was that our articles are too long. Comments such as these

about the typical length of our articles are tremendously valuable to us, if not the easiest thing in the world to address:

- Long, drawn-out methodologies or excessively detailed case histories are NOT helpful. A short, crisp history or methodology would be better. Get to the point and tell me how this will help me do my job better!
- I realize the length is partially driven by the magazine being a quarterly publication, but its length seems to deter all but the most stalwart readers committed to further learning about the acquisition profession.
- The only challenge I have is that sometimes the articles are a bit lengthy. Shorter reads help get to the point and provide a quick snippet of useful information.
- One problem I have is time to read the articles. I think there's useful information in the magazine; however, I don't have time to read lengthy articles. Shorter versions or summaries would be nice to see, as long as it doesn't impact the content too much.

You may recall the quote, "If I'd had more time I would have written a shorter letter," which has been attributed variously to Benjamin Franklin, Woodrow Wilson and many others. Short is hard—this article is a testament to that—but that doesn't mean we won't take up the challenge.

More than any comment like "great magazine" or "it is completely useless to me," these responses are news we can use. We've already made changes to address article length since our last magazine survey in 2014, but clearly we haven't done enough. Look for more changes in upcoming issues.

CAREER AND FINANCE

Some respondents wanted more insight on the planning, programming, budgeting and execution process, with particular emphasis on finance. Indeed, one respondent wrote, "There is nothing related to budgeting, POM, financial management" in the magazine. He or she went on to say that "I believe that this is necessary, as I think PMs are least knowledgeable in this area. Without any leadership emphasis, they continue to disregard fiscal and appropriations law." That is a fascinating comment, and one we will do our best to follow up on.

Another topic high on the list of respondents' suggestions was career-related information. All of these suggestions are worth pursuing:

- Articles on how to handle difficult situations with your supervisor.
- Organic workforce requirements throughout the life cycle and why we need them/plan for them.
- Acquisition workforce professional development and career path to [product manager, project manager and program executive officer] positions.
- More up-to-date courses in acquisition workforce training.
- Talent management and opportunities for progression for newer employees are always interesting to me.
- Leadership and opportunities for low-ranking civilians.
- Future of the civilian workforce.
- Acquisition perspective from interns, DCS [deputy chief of staff] and employee concerns.
- Focus MORE on how contracting officers can improve, maybe a specific lessons learned section for them. Dos and don'ts.

Some of those may not be possible, but all of them are worth further thought.

CONCLUSION

You may think this sounds corny, but if you're a member of the Army Acquisition Workforce, Army AL&T is your magazine. We make it our job to make Army AL&T such a useful and important magazine that it becomes a must-read in your job.

It would take years to implement every suggestion we received in our 2016 survey, but we will address those that we feel are feasible and necessary, even mission-critical, such as those mentioned, in whatever ways are available to us.

We intend Army AL&T magazine to be a continuous dialogue. It is incumbent upon our readers to do just what they have done in this survey: Be honest—brutally so, if necessary. Your active participation is critical to the success of the magazine, and the success of the magazine is best measured by the success of you, our readers, in doing your jobs meeting the needs of the Soldier. If there is something we can do better, please let us know.

MR. STEVE STARK is senior editor of Army AL&T magazine. He holds an M.A. in creative writing from Hollins University and a B.A. in English from George Mason University. In addition to more than two decades of editing and writing about the military, science and technology, he is, as Stephen Stark, the best-selling ghostwriter of several consumer health-oriented books and an award-winning novelist.

CAPT. RAVEN CORNELIUS

COMMAND/ORGANIZATION:
U.S. Army Intelligence and Security Command Acquisition Center

TITLE: Contract specialist

YEARS OF SERVICE IN WORKFORCE: 3.5

DAWIA CERTIFICATIONS:
Level III in contracting

EDUCATION:
MBA in finance, Columbia Southern University; B.A. in liberal arts, Hays State University; A.A. in management, Portland Community College

AWARDS:
Defense Meritorious Service Medal, Joint Service Commendation Medal, Army Accommodation Medal (3), Army Achievement Medal (2), National Defense Service Medal, Afghanistan Campaign Medal, Iraqi Campaign Medal (2), Global War on Terrorism Service Medal, Korean Defense Service Medal, Military Outstanding Volunteer Service Medal, Army Service Medal, Overseas Ribbon (4), NATO International Security Assistance Force Medal, Expeditionary Contracting Command Contingency Contracting Officer Award, 413th Contracting Support Brigade Officer of the Year

Contract specialist seeks to be 'voice of the warfighter'

Capt. Raven Cornelius is good at saving the Army money. During a 2014 deployment to Regional Contracting Center – East at Bagram Airfield, Afghanistan, when she served as joint team lead and contingency contracting officer for the U.S. Central Command – Joint Theater Support Contracting Command (C-JTSCC), she terminated and settled more than two dozen contracts valued at $20 million, and closed nearly a dozen more Defense Contract Management Agency and C-JTSCC contracts worth $14 million.

She's now lead contract specialist for the U.S. Army Intelligence and Security Command (INSCOM), managing contract actions from procurement to post-award for $7.6 billion in global intelligence support services contracts. Her work supports INSCOM, the U.S. intelligence community, combatant commands and Army service component commands worldwide. "My role is to ensure that requirements needed to shape the mission are available to the warfighter," she said. "Combat effectiveness is essential in the Army, and the work I do is an essential piece of the puzzle that enables mission success."

Cornelius credited a handful of mentors with her career success, and she noted that those mentors "pushed me to be the voice of the warfighter and impact the military for positive change. A contract creates positive change to both the mission and the warfighter by allowing them to focus on their job."

ACQUISITION

CONTRACT BRIEFING

Cornelius, right, briefs INSCOM Acquisition Center staff members, from left, Sgt. 1st Class John Wysocki, Maj. Ryan Ocampo and Betty Jarman. (Photo by Ron Young, INSCOM Public Affairs)

Among her mentors is Irvin Bonus, her former team leader and now team leader for Regional Contracting Office – Hawaii, part of the 413th Contracting Support Brigade (CSB). "He is an excellent mentor who challenged me to learn the Federal Acquisition Regulation [FAR] and understand the importance of contracting," said Cornelius. She took that advice to heart, earning a certification of federal contract management from the National Contract Management Association along with her Level III DAWIA [Defense Acquisition Workforce Improvement Act] certification in contracting as a way to better understand the FAR.

Col. Kevin Nash, her commander in the 413th CSB, also has been an important part of her professional development. "His leadership and mentorship were key in showing me what a military acquisition professional should be," said Cornelius. Nash helped Cornelius master operational contract support and become a valuable business adviser to the command, she said, skills that improved her ability to write contracts as well as to brief and provide input at the senior level.

Perfecting those skills and building a solid foundation are vital to success, Cornelius noted, as is stepping outside one's comfort zone. "Contracting is evolving, so don't be discouraged if you don't grasp everything," she said. "Challenge yourself each day to learn something new and assist with unfamiliar requirements. Learning opportunities are endless in this career, so take advantage of them." Finally, she added, "Take pride in your career and learn everything you can to be able to understand why acquisition is a mission enabler."

Cornelius' military career started right after high school. Following the path of her father—"my biggest hero," she said—she joined the Army in 1999 as a private. She left active duty and earned a bachelor's degree, and returned to active duty to attend U.S. Army Officer Candidate School (OCS).

Following OCS, Cornelius spent seven years as a chemical officer. In late 2011, she was working in the Operational Protection Directorate for Eighth Army and was assigned to a team researching ways to measure and reduce warfighter exposure to radiation. "As a result of our work, we identified and fielded radiation detection equipment to subordinate commands to allow for low-level radiation monitoring of more than 28,000 service members across the Korean Peninsula," Cornelius said. That assignment also gave her the opportunity to meet people from the acquisition community, "and I became very interested in that career field," she said, "as a way to mitigate threats and provide products viable to the field." She transitioned to the Acquisition Corps a year later.

"I have been exposed to many different levels of acquisition to understand why what we do is invaluable, and I've had the opportunity to work with different services' components in multiple countries—and I have found every minute of it rewarding," she said.

Maintaining mission focus is the most challenging part of her work. "Sometimes the mission exceeds the existing capabilities," she said. "We face challenges in handling all the requirements in the time frame requested for each mission." The solution? Old-fashioned hard work, according to Cornelius: "longer hours when they're needed to be sure we complete the requirements needed to enable the mission."

—MS. SUSAN L. FOLLETT

TAKING CYBER TO THE FIELD

Army infantrymen assigned to the 1st Armored Division assault an objective during Army Warfighting Assessment (AWA) 17.1 at Fort Bliss, Texas, in October 2016. The Army Rapid Capabilities Office used the AWA, the first in what will be a series of annual events, to gather Soldier feedback on current and emerging electronic warfare and cyber technologies—part of an Armywide push to focus scarce resources where they will give Soldiers a true edge in the fight against a peer adversary. (U.S. Army photo by Spc. Tianna S. Wilson, 7th Mobile Public Affairs Detachment)

DETER *and* DEFEAT

Fifteen years of irregular warfare took a toll on the capabilities needed to defeat a peer competitor. So, when a recent RAND Corp. study prompted stunning headlines, it was nothing that the Army didn't already know. Through war games and studies, the Army has sought to identify how best to align resources to address the current threat landscape.

by Lt. Gen. Michael E. Williamson, Lt. Gen. Joseph Anderson and Lt. Gen. John M. Murray

Gen. Mark A. Milley, the Army chief of staff, is famously blunt about his priorities—and the tension between them. Today readiness is indisputably his No. 1, but in a constrained fiscal environment it crowds out resourcing for end strength, infrastructure and modernization. In Milley's words, "We are mortgaging future readiness for current readiness," even as numerous studies and war games show that potential future conflicts with nation-states pose the gravest threats to our forces.

Strategic acquisition is especially challenging in this landscape. After 15 years of irregular warfare and a prolonged period of budget uncertainty, Army modernization accounts are down and resources are spread thin across equipment portfolios. Over this period, increasingly tenuous assumptions about the likelihood of certain contingencies, and an assumed reliance on air, sea, space and cyber superiority, guided choices to accept risk in investment accounts. Risk was also taken in future force development to pay for the readiness required to meet current demand for Army forces from our combatant commanders.

Yet new challenges from rapidly modernizing peer competitors have emerged that threaten our current forces and capabilities, even as demand for Army forces for combat operations, deterrence and global engagement continues unabated. These operational conditions pose concrete modernization questions: Which programs to increase or sustain? Which to reduce or cancel? What are the consequences to Soldiers, the industrial base, the other services? Should we stick to safe precedent or take a chance on sweeping technological change? How do we sustain and improve interoperability with allies and key partners?

To frame and address these decisions, the Army has acknowledged the need to better prioritize current and emerging threats, define the capabilities required to confront these threats, and direct its limited modernization resources accordingly. Luckily, much of the necessary work in all three areas is ongoing.

GAMING TO MODERNIZE

A map, grid and unit markers are displayed during a recent RAND war game tabletop exercise. War gaming, recent operations and training events have reflected capability gaps that the U.S. could encounter against a peer adversary in a multidomain battlespace. Fifteen years of irregular warfare in Iraq and Afghanistan, coupled with years of budget uncertainty, put the Army in the difficult position of trading off between current and future readiness. (Photo courtesy of RAND Corp.)

Some of these efforts have already borne fruit, and the remainder offer promising new approaches or methodologies that could substantially improve our ability to modernize for the most demanding challenges the future force could face. While we don't control our ultimate bottom line, we now have the means to better target modernization to achieve readiness today and tomorrow.

PRIORITIZING CHALLENGES

The headlines were jarring: "If Russia Started a War in the Baltics, NATO Would Lose—Quickly," said one. "Russian Invasion Could Overrun NATO in 60 hours," read another. The stories went on to report the results of a RAND Corp. study, released in February 2016, which revealed the vulnerabilities of the United States military and its allies if Russian forces were to invade the neighboring NATO member states of Estonia, Latvia or Lithuania: outnumbered troops, blocked and contested airspace, cyber interruptions and heavy casualties. While Russia could not sustain a protracted conventional war with NATO, the study concluded, it could achieve a rapid, localized victory that would force the alliance into an array of bad options.

While RAND sounded the alarm in public, the Army was already working behind the scenes to assess and adjust to the new global realities. Russia's aggression in Ukraine in 2014 and 2015 prompted the Army to form the European Strategic Assessment Team, a cross-functional task force including experts from across HQDA staff and other Army elements that studied Russia's actions and capabilities and offered initial recommendations. In 2016, the U.S. Army Training and Doctrine Command (TRADOC) conducted the Russian New Generation Warfare study, which offered a deeper analysis of the strategic, operational and tactical challenges posed by Russia's approach to hybrid conflict that mixes subversive and direct political and military tactics.

As new gaps in U.S. manpower, tactics and technology became apparent, senior leaders in the Pentagon ramped up troop levels and training in Europe to boost readiness and reassure our allies. But on the modernization side, the Army—having focused its modernization on the irregular wars of the past 15 years—faces a shortfall in critical capability areas like short-range air defense, long-range precision fires, counter-fire, electronic warfare and active protection systems for main battle tanks.

The challenge is not limited to Russia, though its annexation of Crimea and intervention in Ukraine and Syria have attracted the most attention. A series of studies, reports and war games conducted by the Army G-2, TRADOC G-2, Center for Army Analysis (CAA), TRADOC Analysis Center (TRAC), RAND and others have examined various scenarios involving China, North Korea, Iran, the Islamic State group and other terrorist groups. Each employed its own methodology, but all highlighted current and emerging capability gaps the U.S. could encounter if confronted with aggression on land, over water, with weapons of mass destruction (WMD) or through hybrid warfare.

The common thread—in the research findings as well as intelligence updates and observations on the ground—is the urgent need to adapt our modernization efforts to a different, and in many ways more challenging, environment. Societal, geopolitical, economic and technological forces are changing the character of war. The next 25 years will not be like the last. All forms of warfare are becoming faster, deadlier and more ambiguous, and they are expanding into new physical and virtual fields that will challenge our forces in all domains of warfare—air, land, sea, space and cyberspace.

After a decade and a half of developing the Army to deter regional powers like North Korea, fight insurgents in Iraq and Afghanistan, and conduct global

counterterrorism missions, it is time to prioritize the capabilities necessary to deter and defeat technologically sophisticated peer military powers like Russia. Even if we do not fight a military peer competitor, we can expect to encounter their advanced equipment in the hands of their surrogates or customers. This will require big changes in how we build our force, and having the right analytic underpinnings will be important to prioritizing the necessary changes.

PRIORITIZING CAPABILITIES AND RESOURCES

To inform these decisions, we need objective answers to a few big questions: Do Army investment priorities match the highest-priority gaps and opportunities? How should the Army change its investments to address peer competitors? Are we building the right force for the future?

The most overarching of the Army's recent efforts to focus modernization to deter and defeat peer adversaries is known as the strategic portfolio analysis review (SPAR). Consolidating several previously separate modernization forums, SPAR is a new annual review process that examines Army capabilities over a 30-year period, assesses cross-portfolio priorities and identifies investment and divestment opportunities. It divides programs into four "buckets" for recommendations to senior leadership: accelerate, sustain, reduce or divest. This information enables the Army to invest in the capabilities most critical for meeting our toughest threats, while taking risk or divesting in other areas that—while still important—are less threatening to the security of our citizens and our national interests.

A number of ongoing studies and efforts underpin this effort to better align our capabilities and resources against the prioritized challenges discussed above. For example, TRADOC's Russian New Generation Warfare study identified modernization proposals based on deep analysis of a specific threat, and its annual capabilities needs assessment produces a detailed, prioritized list of capability gaps derived from analyzing a broad array of potential adversaries and conditions.

Analytical war games conducted by TRAC and CAA simulate prioritized threats, run multiple combat iterations under various conditions to identify critical capability gaps that impede the Army's performance, and test the relative promise of proposed capabilities or technologies. CAA also conducts the annual Total Army Analysis, which informs demand for capabilities through a scenario-informed look at required Army structure. This year, the Army G-3/5/7 developed a prioritized list of capability shortfalls, gaps and opportunities that synthesizes the outputs of these and other efforts based on an analysis of operational demand and risk against a military peer like Russia.

A particularly interesting example is the strategy-to-resource prioritization (SRP) framework, a new tool developed in partnership between the Army and the RAND Arroyo Center. By combining realistic RAND war games with Army data and analysis, the SRP effort aims to explicitly link Army acquisition decisions to operational risk and likely strategic

FORWARD

An M1A2 main battle tank assigned to 1st Battalion, 35nd Armored Regiment breaches obstacles during AWA 17.1. Active protection systems for main battle tanks are one of several critical capabilities that would be key in any conflict with a military peer like Russia, but they have atrophied in recent years as the Army has faced nonpeer adversaries. The Army is focusing modernization efforts on those capability gaps. (U.S. Army photo by Pfc. Frederick Poirier, 55th Combat Camera)

HYPOTHESIZE, SIMULATE, ASSESS

U.S. Special Forces Soldiers conduct a downed-pilot simulation during AWA 17.1. As gaps in U.S. manpower, tactics and technology became apparent, Army leadership ramped up troop levels and training. But the service still faces capability shortfalls in several areas, including short-range air defense, long-range precision fires and electronic warfare. (U.S. Army photo by Pfc. Alexander Holmes, 55th Combat Camera)

outcomes—and in the process, help focus resources on our most critical gaps and promising opportunities.

For example, in the event of a crisis in Europe, knowing how a certain electronic warfare technology could boost U.S. ground troops' chances of survival against robust Russian artillery strikes would strongly argue for fully resourcing and even accelerating that program. Knowing how specific armored vehicle upgrades could protect commanders' maneuver options in a European scenario would inform resource trades, such as how to scope and stagger those improvements for maximum impact.

To link outcomes to programs and vice versa, the Army and RAND team devised the SRP methodology, which breaks down strategy into operational tasks (e.g., command, strike, defeat, protect, sustain); then into critical capabilities (e.g., suppressing enemy air defense, managing electronic signatures). Within each capability, it identifies gaps and their severity: Could we lose a battle or campaign, suffer casualties, be functionally impaired? Then, to see what would close the gaps, an assessment of programs is produced that factors in performance, cost and risk, as well as current and future investments.

This framework is at the heart of an ongoing RAND study, "Prioritizing Army Programs," which is currently delivering initial analysis to inform the program objective memorandum (POM) for FY19 through FY23. Initially organized by theater scenarios (such as a Russian invasion of the Baltics or a North Korean WMD threat), the analysis also incorporates informed assumptions on adversaries' force posture and capabilities; the roles of U.S. services and allied partners; treaty obligations; posture and policy constraints; and other key variables in order to predict likely options and outcomes.

After receiving initial results in late 2016, the study team will add more scenarios, programs, capability gaps and analytic depth to inform POM decisions and longer-term strategic planning. Although we expect to have most of the results in hand by August, once the SRP analytical framework is fully established we can continue to refresh the data and undertake the right kinds of analyses to reflect new operational, fiscal and programmatic developments. The intent is not a static study but a "living" framework and way of thinking that the Army can leverage for years to come. The Army Rapid Capabilities Office, which reports directly to the secretary and chief of staff of the Army to expedite the fielding of critical combat capabilities, can also take advantage of the framework as it prioritizes opportunities to accelerate systems based on emerging threats and critical capability gaps.

CONCLUSION

For the first time in decades, the Army faces peer adversaries whose capabilities rival our own—and in some areas, simply exceed our capacity. We are well aware that we must make hard choices to close critical capability gaps in order to deter—and, if necessary, to win—the wars of the future. Given budget constraints, we must do this while balancing current readiness and end strength.

To protect our Soldiers and U.S. interests around the globe, it is our responsibility to make sure we apply our limited resources toward those areas where we have the most to lose—and therefore the most to gain. That's why all of our Armywide prioritization efforts are so important. They

allow us to better match resources to strategy and real-world operational risk, leading to more informed and defensible decisions on where to "place our bets" as we strengthen our Army's readiness, today and into the future.

For more information, go to ***http://www.rand.org/ard.html****.*

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LT. GEN. JOSEPH ANDERSON is the deputy chief of staff, HQDA G-3/5/7. He has served in the Army for more than three decades. He received his commission in the Infantry Branch from the U.S. Military Academy at West Point and holds master's degrees in administration from Central Michigan University and in national security and strategic studies from the Naval War College.

LT. GEN. JOHN M. MURRAY is the deputy chief of staff, HQDA G-8. He has served in the Army for more than three decades. He received his commission in the Infantry Branch upon graduation from the Ohio State University and holds a master's degree in national security and strategic studies from the Army War College.

Getting *to WORK*

None of what the Army Rapid Capabilities Office does can be found in a requirements document, so the office's director of operations, Maj. Gen. Walter E. Piatt, provides an overview and answers to questions about how strategic demand drives its battle rhythm and ground rules.

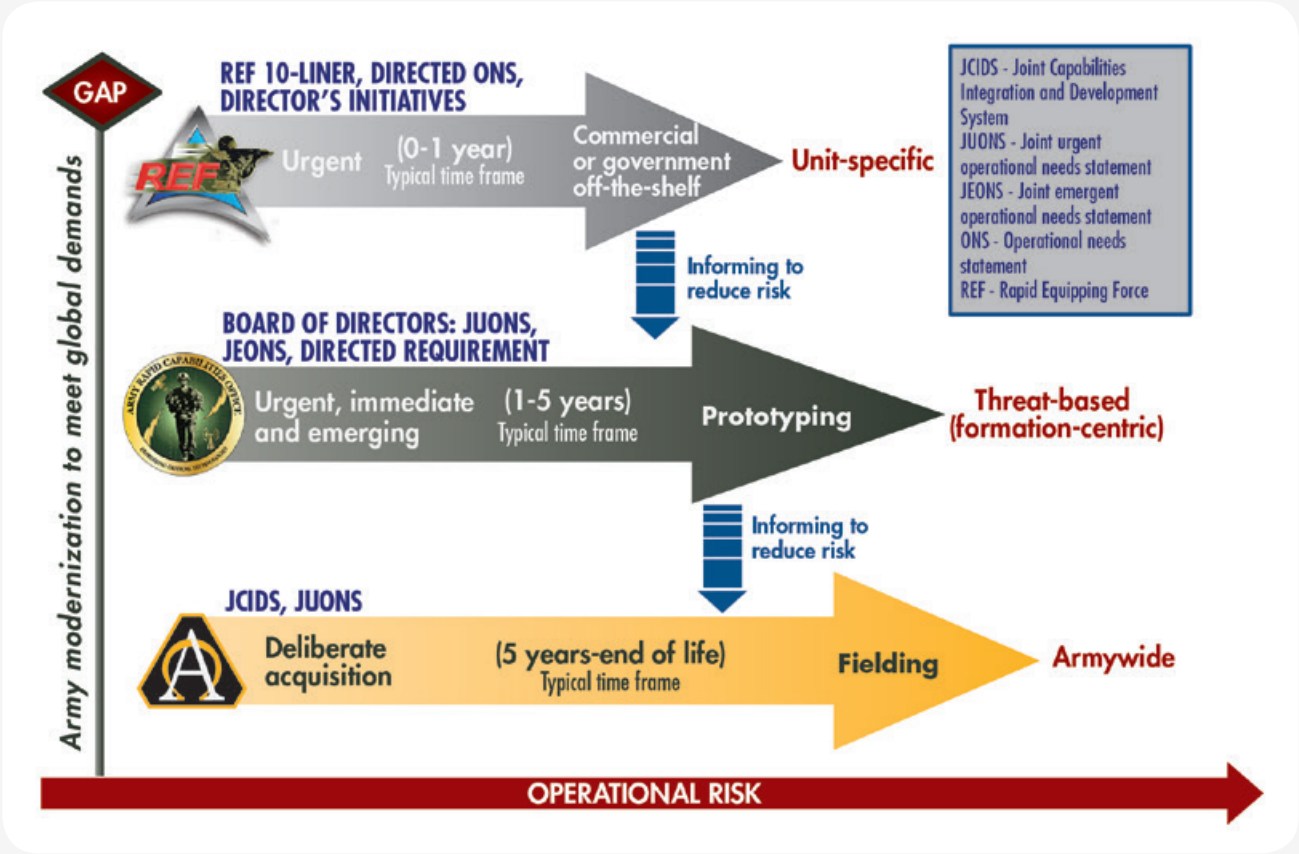
"The art of war teaches us to rely not on the likelihood of the enemy's not coming, but on our own readiness to receive him; not on the chance of his not attacking, but rather on the fact that we have made our position unassailable."

Written by the legendary Chinese general and military strategist Sun Tzu, these words are 2,500 years old, yet they speak directly to how we must prepare and modernize today's Army.

Our enemies are chipping away at our long-held technological dominance and deterrence. They've studied our strengths, such as comprehensive battlefield communication networks linked to GPS, and turned them into vulnerabilities. They've exploited commercial technological advances, such as jammers and drones, faster than our own requirements and acquisition processes can keep up.

DOD's third offset strategy is attacking the problem by aggressively adopting the disruptive technologies, operational tactics and organizational constructs necessary to compete in today's environment and deter potential adversaries now and in the future. In the Army, the recently created Rapid Capabilities Office is fortunate enough to be at the forefront of the effort to enable both the third offset and the Army modernization strategy.

The Rapid Capabilities Office is just one piece of the Army's overarching effort to make the acquisition system work better to answer strategic demands. It gives the Army a way to constantly evaluate the threat environment, put the highest-priority gaps in front of senior leaders and accelerate capabilities fast enough to make a difference. But we're not just responding to the enemy's actions—we're also taking the initiative to find those disruptive capabilities and create overmatch so our adversaries don't want to take us on.



MULTIPLE ROUTES TO THE SOLDIER

The Army Rapid Capabilities Office adds an option between the deliberate pace of big programs and the quick response of REF. Allowing the acquisition process for a given capability to match the urgency of the need makes acquisition as a whole more nimble. (SOURCE: Rich Ryan, U.S. Army)

None of this is found in a requirements document. So how does the Rapid Capabilities Office deliver on its mandate? Over the past few months, in establishing the details of how the organization will function, our team has developed the charter, battle rhythm and other processes that we will use. In the interest of transparency and teamwork across the Army, we have shared an outline of our operations and answered several key questions below.

The future is unknown, and we have to be prepared to defeat an enemy we do not understand with methods not yet developed and with means not yet invented. The Army must be prepared to fight in a contested, multidomain battlefield that combines land, air, sea, space and cyber. The Rapid Capabilities Office will enable these imperatives, complementing the Army's overall modernization strategy by doing what it takes to move faster when the world demands it.

Q. What is the scope for Rapid Capabilities Office projects, and what is your relationship with the Rapid Equipping Force (REF) and programs of record (PORs)?

A. We are focused on urgent, immediate or emerging threats as defined by Army leadership, where the materiel solution meets a combatant commander's need and can be developed and fielded in one to five years. Our primary focus is on capabilities that enable the Army to fight in contested environments. The initial categories we're looking at are cyber; electronic warfare; survivability; and positioning, navigation and timing (PNT), which enables troops to operate

when their GPS signals are jammed or compromised.

We are not replacing the REF, which does a fantastic job of answering immediate needs from Soldiers on the ground; that mission will continue. We will work closely with the REF to give our formations the right capability solutions at the right place and right time to be successful.

We are also not an end run around the PORs that produce systems for the entire Army and the full spectrum of war. We are focused on specific regions and specific threats, which will allow us to combine technologies in innovative ways, do a quick assessment and deliver them to the point of need as soon as possible. Even if it's only an 80 percent solution, getting it into Soldiers' hands to use and experiment with puts us closer to the target than before. What we learn from these projects may also help us make smarter decisions for the Army's long-term programs.

Q. What is your battle rhythm for meeting with senior leaders, and how will the Rapid Capabilities Office vet projects before presenting them for decisions?

A. The Rapid Capabilities Office reports to a board of directors led by the secretary of the Army and including the chief of staff of the Army and Army acquisition executive. The board meets approximately every 30 days.

Everything that goes to the board is informed by the work that the Army is already doing, such as the G-2's threat assessment, the G-3/5/7's priority list and various requirements and gap analysis by the Training and Doctrine Command. The Rapid Capabilities Office is relying on total Army expertise to confirm what is most pressing for us to address, how best to address it, and how our projects will support larger strategic goals.

The team also came up with an innovative, virtual tool we're calling the Rapid Capabilities Office Decision Book. We will use the book to collect specific feedback from various commands so projects can be vetted within that quick board decision cycle.

Q. How will the Rapid Capabilities Office transition prototyping efforts to PORs?

A. Since we're operating on a small scale, the Army can use this office to take some risks that large programs can't. That will be a good thing for PORs that work with the Rapid Capabilities Office to accelerate a certain component of the program to answer pressing needs—and maybe in the process find something that should transition permanently. A good example is how we are collaborating with the Project Manager (PM) for Electronic Warfare & Cyber, which is part of the Program Executive Office [PEO] for Intelligence, Electronic Warfare & Sensors, on the integration of current and emerging electronic warfare capabilities that can be used for new strategic effects. Everything we're doing is nested in that PM's overall plan.

From the beginning of standing up this office, we've been mindful of lessons learned from the recent past on what happens when the Army deploys quick-reaction capabilities in isolation, without the right training, doctrine, tactics and sustainment. We're building these factors into our analyses up front, and because we're leaning on PEOs and PMs throughout the project execution process, our transition assessments will be informed by PEO and PM input. When those transition recommendations go to the board, they will include the transition path for a Rapid Capabilities Office project, the phase at which the project will enter the acquisition system and its relationship to existing PORs. This approach will ensure that all life cycle management responsibilities are fully addressed.

Q. How will the Rapid Capabilities Office measure success?

A. Our job is to make sure, when we send Soldiers into harm's way, that they don't have a fair fight—they have a tactical and technological advantage. We will measure success by how well we enable the Army to modernize faster and better, so our Soldiers can succeed even in contested environments. Every process we set up must facilitate that goal, and if the processes aren't working, we will adjust and improve.

From a technology perspective, we may not always get to the right answer immediately. Sometimes the solution we deliver may only address part of a gap—but at least we won't be waiting decades for a program to mature to find out we were wrong.

That's what the Rapid Capabilities Office brings that the Army didn't have before: It's bringing acquisition front and center, and putting these key capabilities in front of top leadership so they can decide fast enough how to offset our adversaries.

—MAJ. GEN. WALTER E. PIATT

DO YOU SEE WHAT I SEE?
Pvt. Zachery T. Strother of the 40th Engineering Battalion conducts training maneuvers in an M2 Bradley Fighting Vehicle at AWA 17.1 in October 2016 at Fort Bliss, Texas. While NIEs focus on formal testing and evaluation of programs of record, AWAs focus on getting Soldier feedback on new concepts and capabilities with an eye toward reducing acquisition timelines. (U.S. Army photo by Sgt. Steven Hitchcock, 55th Combat Camera)

RECALIBRATING REQUIREMENTS

With the help of groundbreaking efforts by professional combat developers, requirements writers and program managers, ARCIC is looking to thaw the glacial pace of acquisition and speed capabilities to the warfighter as the Army warms to new ways of doing business, welcoming innovation and involving industry early and often.

by Mr. Steve Stark and Ms. Margaret C. Roth

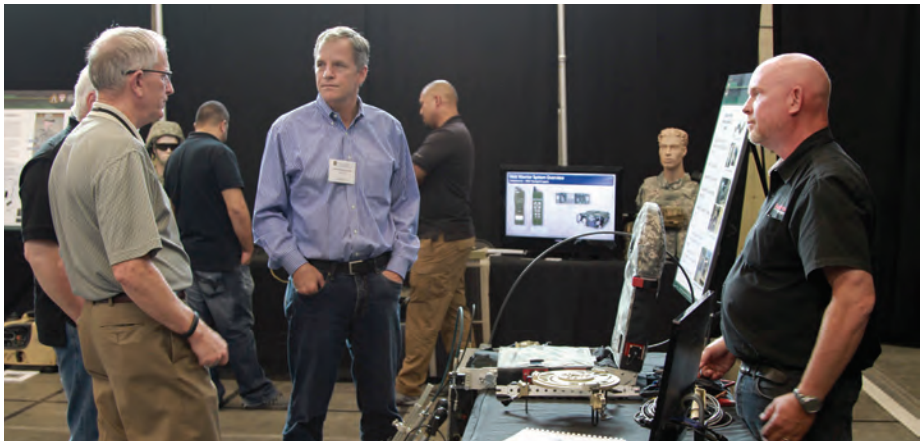
The bad news is that the Army has a big problem: an entrenched process that cannot generate capability requirements fast enough to get the capability into Soldiers' hands when they need it.

The good news is that the Army is taking very seriously its efforts on innovation—innovation in the systems it procures as well as in the ways it procures them—with the realistic hope of speeding acquisition in ways large and small, and getting advanced, much-needed capabilities to the Soldier more rapidly.

The prevailing view of Army leadership is that defense acquisition is not fundamentally broken; it's just bureaucratic, outdated, rigid and very slow.

The process, built on the mighty triad of the Joint Capabilities Integration and Development System (JCIDS), the Defense Acquisition System and the Planning, Programming, Budgeting and Execution system, has become an equation for failure—failure to deliver to Soldiers on the battlefield the capabilities they need. That's according to interviews that Army AL&T conducted in October and November 2016 with the Army Capabilities Integration Center (ARCIC) leadership and senior staff, acquisition program managers and representatives of

TIGHTENING THE CIRCLE
Troy Takachi, right, discusses the features of the Kairos Rapidly Installable Robotic Applique Kit with members of the Board on Army Science and Technology at AWA 17.1. Improving collaboration with industry in future AWAs will yield a greater ability to provide interim solutions to AWFCs, one of the goals of the AWA concept. (Photo by Staff Sgt. Cashmere Jefferson, 7th Mobile Public Affairs Detachment)



industry who are working with the Army on new capabilities.

One of those senior leaders, Maj. Gen. Robert M. "Bo" Dyess, ARCIC deputy director since July 2015 and previously director of force development in HQDA G-8, outlined key factors in this equation, both internal and external: a heavy workload of requirements for the people in the U.S. Army Training and Doctrine Command (TRADOC) who generate them, and inadequate communication from government to industry about what it needs. Nor does government have any means to understand just what industry is capable of.

Building better requirements, a prerequisite to building better capabilities, is a multifaceted endeavor with a boatload of stakeholders. Engaging those stakeholders early in both processes—capabilities and requirements development—is a dramatic departure from business as usual.

Imagine buying a new car, but without being able to go online and do some research or drop by your local dealerships to take a look or a test drive. Instead, you have to document all of the capabilities the car must have—every single aspect of it, from the kinds of materials used in its construction to the sizes of all the nuts and bolts to the engineering specifications of the motor (horsepower, how fast the vehicle can go and in what terrain and weather conditions) and the design of all of the electronics and the software that controls them, all without getting input from industry—car companies. Let's say that it's been 15 years since you bought a new car and your old car has a carburetor, only the most rudimentary computer system, plus a CD player and a cassette deck, and you're not really aware of new developments in automotive technology. What you know is what you've got.

Now that you have documented all of these requirements, let's say you had to put out the specifications for bid to all of the different car dealers you know of. In this scenario, you wouldn't even be aware that you could get an all-electric car or that many new cars come with autonomous braking if you follow the car in front of you too closely, or sensors to help keep you in your lane.

WELCOME TO MY PAIN

For the uninitiated, capability requirements are both descriptive and prescriptive, going into exhaustive and painstaking detail on why a system is needed and for what, what the system should do and how it should do that throughout its life cycle—and more. A requirements document, which may run to several hundred pages, is a living document, and every time some jot or tittle of the program changes, the program manager must update the requirements documentation with all of the potential ramifications of the changes. Requirements address every aspect of a program or system. They are not optional. In some respects, requirements are so thoroughgoing that it is almost as though a requirements developer must have a crystal ball.

There are good reasons why defense acquisition programs, which can cost many billions of dollars, must have all of their requirements documented and updated. The Army, for example, does

not fund itself and has a fiduciary duty to taxpayers to explain, via its representatives, why it is expending such vast sums. But Congress is not the only audience to whom the Army must report. That reporting is often multilayered and exhaustive—and to those who do it, it can be exhausting. It is no surprise, then, that such painstaking detail takes time, and that, because of all of this time-consuming documentation, a system is likely to be outdated by the time it reaches the end user, the Soldier.

Part of the problem is also the requirements generation process itself. TRADOC, the organization that generates requirements, and ARCIC have worked with the U.S. Army Materiel Command (AMC) through the AMC-sponsored Army Innovation Summits to identify impediments to requirements generation. At the third summit, Dyess said, "We worked with them to identify barriers between government and industry, which seem to pop up frequently. And so we've recommended several ways in order to help the people who do requirements generation … and address barriers with industry."

With respect to requirements, the Army also has to address certain barriers to itself. For example, the positions of TRADOC capability managers are not centrally selected billets, which means they can be staffed by individuals with no or insufficient operational experience. "We think that we should be putting leaders in there that have successfully commanded battalions and brigades," said Dyess. "So we'd like to get the Army to designate those billets as former battalion and brigade commanders, because it's just so critically important that the requirements are written and written correctly, in the beginning, the middle and the end of an acquisition and testing process."

Staffing positions with the right people remains a work in progress, but it is just one aspect of how ARCIC is looking to melt the glacier of acquisition.

Another initiative underway is selective reduction of JCIDS reporting and analysis requirements, in conjunction with acquisition leaders in the Office of the Secretary of Defense (OSD). "We're really trying to look at what is the appropriate level of analysis that's required for each one of the programs that is being worked on," Dyess said. "You don't need to have the same level of analysis for an ACAT [acquisition category] III-level program that you do for an ACAT I-level program with OSD oversight, but you do need to have some level of analysis that ties it to an operational setting in the way in which the capability will be utilized." (For a related article, see "Rethinking the Analysis," Page 42.)

OPENING DOORS

The multiple initiatives underway to speed the acquisition process echo Army Chief of Staff Gen. Mark A. Milley's March 2016 "Report to Congress on Chief of Staff of the Army Acquisition Authorities," in which Milley wrote: "New tools and processes will be essential to the effort. Determining what systems should be developed to support the national military strategy requires extensive and iterative prototyping to allow for refinement of requirements without excessive risk or requirements creep within programs."

WHAT'S ON THE HORIZON

A Soldier with 2nd Brigade Combat Team, 1st Armored Division looks for enemy troops during a simulated attack near Fort Bliss in May 2016 as part of NIE 16.2. By combining the results of NIE and AWA events with its other efforts to overhaul the requirements process, ARCIC is working to get new capabilities into the hands of Soldiers in less time. (U.S. Army photo by Sgt. Jarred Woods, 16th Mobile Public Affairs Detachment)

New tools are exactly what ARCIC is employing, in conjunction with Army and industry stakeholders, to pick up the pace of acquisition. The tools are multidimensional, but they all hew to the priorities and principles of the Army Warfighting Challenges (AWFCs), which grew out of the U.S. Army Operating Concept, "Win in a Complex World," released in October 2014. The AWFCs, currently numbering 20, are "enduring first-order problems, the solutions to which improve the combat effectiveness of the current and future force," according to ARCIC's AWFC webpage. Each challenge has a designated lead within TRADOC.

New capabilities translate those challenges into solutions, and those capabilities require—you guessed it—requirements documents. Therein lies one of the problems, because building better requirements, a prerequisite to building better capabilities, is a multifaceted endeavor with a boatload of stakeholders. Engaging those stakeholders early in both processes—capabilities and requirements development—is a dramatic departure from business as usual.

CLOSE, BUT NOT CLOSE ENOUGH

Dyess addresses the audience at Army Innovation Summit 3, held in August 2016 in Williamsburg, Virginia. The summit was the first that industry representatives were invited to attend, but Army lawyers prevented industry reps from taking part in smaller-group breakout sessions. (U.S. Army photo by Sgt. Eben Boothby, AMC Public Affairs)

Based on Dyess' experience working with the acquisition, testing, requirements and resourcing communities, he noted a new degree of collaboration among those many Army stakeholders, as well as with industry, in determining "what is in the art of the possible."

Lt. Gen. Michael E. Williamson, principal military deputy to the assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)), has seen this increased collaboration across the functional domains of acquisition and between government and industry pay off in measurable efficiencies and reduced risks. "Greater collaboration is critical for improving our requirements generation processes and delivering the right capabilities to our Soldiers in the right time frame," Williamson said. "Our program executive offices and program managers are excited to partner with their counterparts in ARCIC and the centers of excellence, along with industry, and see what results this team sport we call big 'A' acquisition can produce to support our Soldiers in an environment where rapid change is the norm."

Williamson noted that the Army's new Rapid Capabilities Office is "another example of how increased collaboration driven by Army senior leader priorities will require all members of this team sport to come together and find innovative ways to develop and deliver critically needed technologies."

ACCELERATING S&T

In one of several collaborative initiatives, ARCIC formed a Science, Technology, Research and Accelerated Capabilities Division (STRACD) in 2015 by consolidating two divisions, in part out of pragmatism related to the drawdown of forces but also based on a still-maturing and potentially powerful concept: "a unique capability" uniting science and technology (S&T) with rapid capabilities expertise, said Lt. Col. Eric Van De Hey, who leads the Industry Engagement Branch of STRACD.

The accelerated capabilities team historically had worked with the Rapid Equipping Force in quick-reaction fieldings and prototyping assessments. STRACD continues to work hand in hand with the Brigade Modernization Command, an element of ARCIC, to develop scenarios for the Army warfighting

MAKING PROGRESS

Industry representatives take part in a panel discussion at the third Army Innovation Summit in August 2016: from left, David S. Bem of PPG Industries Inc.; Jesse Nunn, Future Research Corp; William "Bill" Phillips, Boeing Defense, Space & Security; and Dr. Robie Samanta Roy, Lockheed Martin Corp. The summits have explored ways the Army and industry can legitimately work together more closely to get the best possible capabilities to the warfighter faster. (U.S. Army photo by Sgt. Eben Boothby, AMC Public Affairs)

assessments (AWAs) and the network integration evaluations (NIEs), the Army's two primary means to provide Soldier feedback on emerging concepts and capabilities in demanding, operationally realistic settings. Both events are designed to deliver the Mission Command Network 2020 and assess interim solutions to AWFCs.

"So," Van De Hey explained, "there was a pretty robust element that was highly involved with some of what's happening with the future of the military, and then we brought in the science and technology piece, which does everything from working with DARPA [the Defense Advanced Research Projects Agency] to the different science boards to working with other elements, such as megacities, subterrain, counter-UAS [unmanned aerial systems], to major efforts such as FVL, or Future Vertical Lift."

The rapid capabilities element was also quite familiar with the Army governance process, including working with the Office of the ASA(ALT) to help shape and influence budgetary planning through the program objective memorandum to support various S&T efforts developed with the Army centers of excellence.

Industry also is, more than ever, a critical player in speeding up the acquisition machine, Dyess said, and is a central focus of ARCIC's efforts. "There's no prohibition against good ideas," he said. "No matter how you slice it, collaboration does remain key to this."

Legal concerns—some of them unfounded, DOD acquisition leaders have stressed—have discouraged Army officials from sharing information on program plans with industry in the past.

The Army Innovation Summits have made cautious strides toward identifying barriers between government and industry, particularly during the requirements-generation process. The third and most recent summit, held in August 2016 in Williamsburg, Virginia, was the first in which industry was invited to participate, but to a limited extent as recommended by government lawyers.

Summit participants agreed that the government needs to do a better job of telling industry what it wants, Dyess said. "There's no forum for industry to address the government to [have it] tell them what it wants, and particularly the Army." Another barrier identified during the summit, he said, was that "small businesses really just don't have a chance to break in."

TRADOC and ARCIC responded quickly to both concerns. First, they introduced the Forum for Innovative Novel Discovery (FIND) at the Association of the United States Army Annual

SEEKING A BETTER PERSPECTIVE
Soldiers from 1st Special Forces Group (Airborne) participate in a Soldier-led training exercise in conventional and unconventional warfare at AWA 17.1. Outfitting U.S. forces to defeat threats from new sources will require an acquisition process that's more agile, innovative and responsive than it has been in the past, and the requirements community is adapting to meet that need. (U.S. Army photo by Spc. Phillip Diab, 55th Combat Camera)

Meeting & Exposition in October 2016 in Washington. FIND, announced through FedBizOpps.gov, invited small businesses to present their ideas and technologies, in this instance in the area of robotics and autonomous systems. Second, in December, ARCIC held its inaugural Capabilities Information Exchange at TRADOC headquarters at Fort Eustis, Virginia, also announced through FedBizOpps.gov, to brief industry on the Army's needs, initiatives and concepts. (See sidebar, "A Rare FIND," Page 34.)

Industry also has been quick to respond to the potential for earlier and closer collaboration with the Army. The National Defense Authorization Act for Fiscal Year 2016, combined with plenty of old-fashioned ingenuity, has yielded significant progress toward more strategic acquisition.

LEGAL QUESTIONS

Some barriers remain to maximizing collaboration with industry in the development of Army warfighting requirements.

In a striking example, the Army made much of the fact that industry would be a part of its third innovation summit. Yet after industry leaders got to the event in Williamsburg, they learned that they could attend only the presentations. Army lawyers had determined that it would be inappropriate for the industry representatives to take part in the nitty-gritty "breakout" discussions with Army leaders because of their competing business interests.

One of those senior industry leaders was a vice president and general manager from BAE Systems, said Jim Miller, director of business development for the company and closely involved with its work on developing Mobile Protected Firepower as part of the Army's combat vehicle modernization strategy. "We were really excited about it, the chance to go to those four-star discussions and be part of it … only to be limited by the legal guys.

That was really unfortunate," Miller said. Similar legal concerns—some of them unfounded, DOD acquisition leaders have stressed—have discouraged Army officials from sharing information on program plans with industry in the past. "The Army leadership and the Army lawyers really need to break the code on that," Miller said.

CONCLUSION

Still, in the ongoing development of acquisition as a team sport, both the roster and the rules show distinct improvement, and nowhere is this more evident than in the process of generating requirements. It is not the only arena in which the rules of the game are changing, but it is arguably the most closely watched—by the Army's combat and requirement developers, their partners in industry and academia and, most important, the Soldiers and their leaders who will take the products of those requirements into battle. "We do want to innovate faster, and we do want to provide capabilities to Soldiers and units more quickly," Dyess said.

"This maturing process that we've gone through as a team between industry and the Army is starting to make [the requirements process] better," Miller said. "I would call it changing. It's been getting better for five or six years, and it's still evolving. There's still room for us to get better."

The testing framework itself is changing as well. While AWFCs continue to steer the prioritization of capabilities, the AWA and NIE events will continue to inform not only the warfighting requirements, but the requirements-generating process.

The Soldier-led AWA, the first of which took place in October 2016 at Fort Bliss, Texas, has become the Army's primary means of identifying and assessing interim solutions to meet the AFWCs, focusing on concepts and capabilities in a rigorous and realistic operational environment without the formal testing constraints of the now-complementary NIEs.

The AWAs and NIEs are both annual events designed to generate Soldier and leader feedback on concepts and capabilities that will improve system performance. Both actively involve industry to encourage private-sector innovation and early collaboration on potential new capabilities. The AWA, however, will maximize collective training resources, joint and multinational interoperability and future force development.

In the end, the principle of rigor behind the requirements-generation process remains the same, Dyess said, because the requirements serve the Soldier: "You have to determine your required capabilities, and then from where you are now to where you want to go, those are the gaps. And then you make recommendations on what solutions you can bring to the force in a time period in order to meet those gaps so that we have both overmatch and to not make it a fair fight, because we don't want a fair fight. We want to have all the advantages to ourselves."

For more information on ARCIC, the Army's capability and research and development needs and its ongoing initiatives to improve requirements generation, go to ***http://arcic.army.mil/.***

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EYEING CAPABILITIES

A surveillance system scans for possible enemy aircraft during a training exercise as part of NIE 16.2. Results from the exercise will inform capability and doctrinal enhancements to achieve a less complex and more agile expeditionary mission command network. (U.S. Army photo by Sgt. Jarred Woods, 16th Mobile Public Affairs Detachment)

A RARE FIND

With the establishment of the Forum for Innovative Novel Discovery (FIND) and the Capabilities Information Exchange (CIE), TRADOC has broken new ground, involving industry in creating innovative warfighting capabilities with a clear focus on future force development that will help both ARCIC and industry prioritize their efforts.

"We do have an opportunity to engage industry partners earlier in the requirements process, and we're moving to do that through the CIE and also through the FIND process," said Maj. Gen. Robert M. "Bo" Dyess, ARCIC deputy director.

The initial pilot for FIND brought six companies, chosen from 28 submissions responding to the FedBizOpps.gov announcement, to Washington on Oct. 3-4, 2016, to present their research and development (R&D) ideas and technologies to an audience of general officers from the Army's acquisition, resources and requirements communities. "Essentially we're just kind of teaching, mentoring," Dyess said. "There was no prize of money or anything, but there was a point of contact so we could point them in that direction."

TRADOC chose robotics and autonomous systems as the scope of the inaugural FIND, held in conjunction with the Association of the United States Army (AUSA) Annual Meeting & Exposition. "The next one that we do could be in another capability area," Dyess said. The second FIND event is scheduled to coincide with the AUSA Global Force Symposium & Exposition slated for March 13-15 in Huntsville, Alabama. FIND is expected to continue as a semiannual event, timed to coincide with AUSA's fall and spring meetings.

Lt. Col. Eric Van De Hey, who leads the Industry Engagement Branch in the Science and Technology Research and Accelerated Capabilities Division of ARCIC, described FIND as a rare opportunity for selected small businesses to hear firsthand how they could support the Army's capability needs. It brought the small business entities "before a panel of senior military folks, really looking at the resourcing requirements," to answer questions such as, "What did the small business have to offer the Army? How could the Army shape those offerings?"

Held Dec. 15, 2016, CIE was designed to be a much broader forum, open to all interested members of industry, "to give them an overarching session of what we see the future Army needing,

REALM OF THE POSSIBLE

Like the army warfighting assessments (AWAs) and the network integration evaluations, FIND and the CIE will allow the Army to explore "the art of the possible" using industry prototypes like this Andros FX that was tested during AWA 17.1 in October 2016 at Fort Bliss. Taken together, all of the events provide an opportunity for industry to gain a better understanding of Army requirements, and for the Army to better understand industry's possibilities. (U.S. Army photo by Staff Sgt. Cashmere Jefferson, 7th Mobile Public Affairs Detachment)

and then breakout sessions to address one-on-one questions," Van De Hey said. By briefing industry on the Army's needs, initiatives and concepts, ARCIC leaders hope that the Army will be better able to integrate industry into capability development early and, in turn, help industry make better-informed R&D decisions. The inaugural CIE drew more than 100 companies, he said.

CIE is intended to be a recurring semi-annual event to make it easier for industry—particularly companies that currently don't work with the government—to navigate the bureaucracy or even obviate some of it. According to FedBizOpps.gov, "CIEs will emphasize long-range planning to define future decision points that consider equipment age, degradation of overmatch, industrial base viability and closure of capability gaps in the near-term (FYs 17-20), mid-term (FYs 21-30), and long-term (FYs 31-50) time frames, while allowing for cost-informed decisions that balance force generation needs for Force 2025 and Beyond."

Taken together, said TRADOC spokesman Maj. Thomas Campbell, "the FIND and CIE initiatives demonstrate how TRADOC is leaning forward on working closely with our industry partners to both have a clear picture of what innovative ideas are already out there which could impact future force development, and to communicate our needs to industry early and often." The result, Campbell said, will be to support the Defense Innovation Initiative of "accelerating the process of getting cutting-edge technology into the hands of our warfighters in order to maintain our technological edge over our adversaries."

—MR. STEVE STARK and MS. MARGARET C. ROTH

SEEKING AUTONOMY

Robotics and autonomous systems—like this driverless Palletized Load System displayed during AWA 17.1 at Fort Bliss in October 2016—were the theme of the first FIND. (U.S. Army photo by Pfc. Alexander Holmes, 55th Combat Camera)

TAKING A CLOSER LOOK

A Foster-Miller Inc. explosive ordnance disposal TALON Robot examines a vehicle-borne improvised explosive device during a field training exercise at Fort Bragg, North Carolina, in November 2016. Robotics and autonomous systems were the theme of the first FIND; future FIND events are expected to focus on different capabilities. (U.S. Army photo by Sgt. Timothy Villareal, 20th Chemical, Biological, Radiological, Nuclear and Explosives Command)

VEHICULAR VISIONS

Time was, not long ago, that the only vision for a new Army combat vehicle was the Army's. The service would develop a requirement detailing, down to thread size, the precise design and parts that should go into the vehicle. Industry had a choice: Take it or leave it. Invest and engage in building the vehicle, or don't.

In his 14 years at General Dynamics Land Systems (GDLS), "I saw requirements that were so specific that if you had three people with that requirements document in front of them and they built three vehicles, all three vehicles looked exactly alike," said Mike Peck, GDLS' director of business development. Thus, "you have just eliminated any innovation that they could possibly think of."

MOVING QUICKLY FOR MPF

BAE Systems displayed its Mobile Protected Firepower prototype at the Association of the United States Army (AUSA) Annual Meeting & Exposition in October 2016 in Washington. Events like AUSA provide industry with opportunities to showcase technologies and further conversations with the government to develop requirements for new capabilities. (Photo courtesy of BAE Systems)

Not so with the way the Army Capabilities Integration Center (ARCIC) is executing the Army's combat vehicle modernization strategy. Combat vehicles need to provide Soldiers with speed, protection, lethality and the ability to wage a multidomain battle, working in concert with other ground forces to overwhelm the enemy with multiple simultaneous challenges.

A 'TOTALLY NEW' VEHICLE

The Army particularly needs the as-yet nonexistent Mobile Protected Firepower (MPF) vehicle to support infantry brigade combat teams—a lightweight vehicle that can be airlifted into battle and maneuver, dispersed if necessary, in close-quarters urban terrain, but with lethal long-range firepower to take out enemy armored vehicles. The idea is to defeat enemy positions and destroy their light armored vehicles pre-emptively to provide U.S. forces with greater freedom of movement. MPF is now the Army's highest mid-term priority in combat vehicle modernization.

"We're going to need a totally new combat vehicle, and we don't even know what it looks like," said Lt. Col. Andy Sanchez, chief of ARCIC's Maneuver, Aviation and Soldier Division. "There's a huge effort to begin to look at offensive capabilities that can attack an enemy even before, ideally, the first kinetic or lethal munition has been fired. Ideally, you render an enemy at least degraded, making him fight degraded, before he's even put boots on the ground. And when you can get into an adversary's decision cycle with those types of capabilities, it makes them think differently about certain courses of action."

Five to 10 years ago, "industry was pretty much nonproactive" in building new platforms, Peck said, "almost a slave to waiting for that RFI [request for information], RFP [request for proposals], sources-sought kind of announcement." By contrast, in 2013, the Army started asking industry what it could do about MPF.

"We started talking about the potential for using old and new vehicles, what was in the possible range," said Jim Miller, director of business development at BAE Systems. "It's been several years of talking. A lot of the up-front discussions have proven to be very beneficial," including those with ARCIC and the U.S. Army Tank Automotive Research, Development and Engineering Center.

EARLY SIGNS OF SUCCESS

ARCIC disseminated its draft MPF requirements document to industry and held an MPF industry day in early August 2016 at Fort Benning, Georgia, that was

THE GRIFFIN LANDS

GDLS displayed its Griffin tech demonstrator at the AUSA Annual Meeting & Exposition. The tech demonstrator offered a tangible starting point for government-industry conversations about the Army's requirements for MPF, with the ultimate goal of avoiding requirements so prescriptive that they rule out the possibility of industry innovation. (Photo courtesy of General Dynamics)

hosted by the U.S. Army Maneuver Center of Excellence. The resulting discussions have included the timeline and costs for developing MPF. "The process … has been pretty successful so far," said Miller, who noted that major corporate investments are riding on certain key decisions the Army makes up front on a combat vehicle, including its size, weight, survivability, crew size and the kind of aircraft that will transport it.

Miller said a big problem in requirements development of the past has been late-breaking decisions or revisions of key performance parameters. The process of developing requirements needs to settle these major decisions up front, he said. "And then you get to the smaller things that the Army wants, all the way to the widgets. It helps us decide how we want to spend our money."

The lines of communication between ARCIC and industry on what the Army wants in the MPF have been open enough that GDLS was able to put together a technology demonstrator in five months for the Association of the United States Army Annual Meeting & Exposition in October 2016 in Washington. It wasn't just "come up with a solution [and] hope for the best," as in past years, Peck said.

GDLS' tech demonstrator—called the Griffin, and not a prototype but at least "a conversation piece that is much more than a PowerPoint," as Patricia Sellers, GDLS business development manager, put it—got underway even before the industry day, incorporating characteristics that the company thought the Army might want, such as in the turret and gun. "And the Army looked at [the Griffin] and touched it and got inside it. … It created that dialogue between Army and industry that is essential for doing anything quickly, for informing Army requirements or helping the Army refine those requirements, by providing that conversation piece," Sellers said.

CONCLUSION

The Army's combat vehicle modernization strategy as a whole envisions both new vehicles and incremental technological improvements, informed by a continuous assessment, adaptation and innovation of capabilities, including commercial off-the-shelf solutions. Power generation, gun design, transportability and autonomous technologies will be just a few big pieces of the bigger picture, and they're not likely to come together all at once, but in iterative stages of modernization that require detailed discussion, just as the double-V hull was introduced to the Stryker platform in 2011 to improve survivability. Given what the Army is looking to achieve with the MPF, it might just have to be magical. Or science fiction. But today's science fiction is often tomorrow's science fact.

ARCIC wants industry to know that "we're not just thinking about tomorrow's war, we're thinking out toward, you know, 2035. We've projected the future in terms of near-, mid- and far-term periods, near-term being now until about 2021, mid-term from 2022 to 2031, and 2031 and beyond is considered far-term," said Sanchez. "It helps them better see things through the reality of funding that we have to work in. So when they're delivering, they're delivering to something in those time periods."

At the same time, Sanchez acknowledged, our known and potential enemies are developing similar capabilities. "So it's just a matter of who gets to the better platforms first and who develops the better techniques first."

With its combat vehicle modernization strategy, which the Army can revise as needed, "we have a living document," Sanchez said, that will enable the Army to avoid the mistakes of the doomed Ground Combat Vehicle, canceled in 2010 after the requirements got out of control and the vehicle was deemed unaffordable. The increasingly collaborative and iterative process of requirements development gives the Army an opportunity to discover immediately useful technology and spin it out into capabilities the Soldier can use on the battlefield right now. For things that are conceivable but not yet possible, it gives the Army a much better idea of what needs to be parked for now and what can be driven today.

—MS. MARGARET C. ROTH

A NEW WAY of THINKING

by Mr. Steve Stark

The Ottawa Treaty banning 'dumb' landmines caused a major capability gap in terrain shaping, area access and area denial, but it also created a massive possibility for innovation—and teamwork between government and industry. Now, ARCIC, PEO Ammunition and industry are working together to develop a capability that will go far beyond dumb.

The Gator Landmine Replacement (GLMR) program is, in many ways, emblematic of the kinds of tough but necessary technical challenges that the Army and DOD need to tackle in the coming years as they develop requirements for innovative new battlefield capabilities with strategic consideration for their long-term use and ultimate disposal—in short, the entire life cycle.

Because of international restrictions on the use of landmines and the aging of the U.S. stockpile, DOD needed a better solution to replace the Gator Landmine system, which dates to the 1980s. Right now, four teams are trying to solve that problem after a Defense Advanced Projects Research Agency (DARPA) study showed the feasibility and affordability of a potential technological solution. A whole new way of thinking about terrain-shaping may spin off technologies that have considerable utility in other realms.

It's one thing to put a lot of "dumb" explosives in a field to prevent access; it's another thing entirely to create a sophisticated system that allows access to friendly forces while denying access to enemies. But it's just this kind of tantalizing problem that technology increasingly is solving through innovation. Many times these innovators are small companies, and the Army is looking for ways to make it easier for them to do business with the government.

Along with Russia, China and other countries, the U.S. is not a signatory to the treaty officially known as the 1997 Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Antipersonnel Mines and on their Destruction, commonly known as the Ottawa Treaty. However, it has been U.S. policy during the Obama administration to hew to the treaty's intent. The treaty requires any anti-personnel (AP) munition to have a human-in-the-loop initiation system, which significantly impacts the effectiveness of all current mine systems in the U.S. inventory. That left a major capability gap. But it also created opportunity.

AP landmines, combined with anti-vehicle (AV) landmines, shape terrain on the battlefield. They deny terrain, impede mobility and enhance the effectiveness of friendly direct and indirect fires.

The problem with the landmines comes when a conflict is over and victim-triggered AP mines litter the countryside. The Ottawa Treaty came about after many years of unexploded mines killing innocent civilians and stories of dead or maimed children, farmers and livestock as the result of munitions never cleared.

The Army was trying to partially close that gap with the M7 Spider Networked Munition program. At the same time, DARPA was running the ADAPTable Sensor System (ADAPT) program, which sought to find novel uses and means of rapid production for comparatively cheap commercial intelligence, surveillance and reconnaissance (ISR) sensors. Core hardware and software could be updated as commercial sensors were updated. The results were ADAPT hardware and software packages that could be used for unattended ground sensors with potential military applications.

A small California firm, Fantastic Data, showed that the ADAPT approach was feasible, and DARPA sensed a solution to the landmine capability gap. DARPA asked Fantastic Data to further develop its applications to see if such a capability were feasible. When Fantastic Data showed that it was, DARPA handed the concept over to the Program Executive Office (PEO) for Ammunition and the U.S. Army Training and Doctrine Command (TRADOC) to try to make it a reality. The two organizations turned to the DOD Ordnance Technology Consortium (DOTC) and its industry and academia component, the National Armaments Consortium, to find participants willing to compete.

The difference was that TRADOC did not come up with requirements in a vacuum; instead, the command and the GLMR product manager put out a call through DOTC during the analysis of alternatives phase to find out what industry could do, and used "other transaction authority" (OTA) agreements as the contracting vehicle. Enabled by the National Defense Authorization Act for Fiscal Year 2010, OTAs are designed for use in basic, applied and advanced research and prototyping projects when it's in the government's best interest not to use conventional contracts, grants or cooperative agreements.

OTAs by nature do not have to comply with the many rigorous reporting and documentation requirements of the Federal Acquisition Regulation (FAR). The ability to bypass all the red tape of the FAR provides OTAs with much more flexibility as well as a valuable entry point for "nontraditional" defense companies—in other words, pretty much any company not currently doing business with the government.

CHARGED UP

Soldiers from the 3rd Armored Brigade Combat Team (3rd BCT), 1st Cavalry Division (1 CD) detonate a mine-clearing line charge during live-fire training at the National Training Center at Fort Irwin, California, in October 2016. GLMR's concept involves a self-repairing, meshed network that will continue to function in the event of a breach or sensor malfunction, and has the potential for broader application in military and nonmilitary environments. (U.S. Army photo by Staff Sgt. Leah Kilpatrick, 3rd BCT, 1 CD)

IN SEARCH OF A NEW MINDSET

Using the OTA through DOTC "allows us to get to small businesses that don't normally partner with the government," said Col. Christopher Hall, chief of the Maneuver Support Division of TRADOC's Army Capabilities Integration Center (ARCIC).

"We go out and say, 'Hey, we need somebody to look at the Gator Landmine Replacement problem. Here's a description of what we're looking for;

this is a statement of objectives on what we want it to look like.' And then we send it out to all 500 [DOTC] members."

Other than being a mesh-networked, human-in-the-loop system of munitions, exactly what GLMR will look like and how it will perform have yet to be determined.

The prospective GLMR is "really a family of capabilities that falls underneath this broad topic area of terrain-shaping," said Matt Butler, deputy project manager for Close Combat Systems. "The Army's legacy mine capability … is gone, and that includes capabilities that we use to shape the fight in the deep sense—well forward of our FLOT [forward line of own troops]—but also shape the terrain in a tactical sense, in our engagement area, and then closer in a protective obstacle sense."

All of those capabilities translate to an area of significant size—hence the complexity of the problem. Close refers to hand- or vehicle-emplacement of obstacles out to 4 kilometers from friendly troops. Mid is rotary wing- or artillery-delivered obstacles 4 to 17 kilometers from FLOT. Deep is Air Force bomber- or fighter-delivered obstacles from 17 kilometers out to 300 kilometers, Butler said.

The idea is that GLMR would not only prevent an enemy from using the mined territory, which is something that AP and AV mines do very well, but the new technology also would allow friendly forces to maneuver freely in the same space, something that AP and AV mines heretofore could not.

GLMR's concept means that when something or someone enters the shaped terrain, a sensor alerts a Soldier, who can assess the alert and respond appropriately, either eliminating a threat or logging an incident. A meshed network is self-repairing: Each sensor can communicate with all of the others so that if there is a breach or malfunction and a sensor is destroyed, the rest of the network will continue to function and the barrier will remain intact.

HALFWAY THERE

Pfc. Eric Groom, a combat engineer assigned to the 40th Engineer Battalion, 2nd Brigade Combat Team, 1st Armored Division, adjusts an M7 Spider Networked Munition system during Network Integration Evaluation 16.2 at Fort Bliss, Texas, in May 2016. The Spider represented a partial solution to problems created by mines left on the battlefield after hostilities end; PEO Ammunition, DARPA and a handful of companies and government agencies are working to solve the problem completely. (U.S. Army photo by Spc. Cheneé Brooks, 55th Combat Camera)

Such a network has much wider potential use in military and nonmilitary environments, assuming that it can be made to function as intended. Just the communications capability—which, according to Thomas Hammel, a founder of two-person Fantastic Data, must go beyond 4G LTE—could find utility in many different applications.

But, Hammel noted, while his company did show the feasibility of the concept, "nobody has demonstrated it, and that's one of the things that our team is going to do in phase one." For him, "There's analysis that says you can do something and then there are simulations that say you can do something, and then there's reality. And lots of things fall apart when they get to reality."

In many respects, that's exactly what the ARCIC and PEO Ammunition folks are working on in a broader context—giving promising capabilities a better chance to succeed when they do come up against reality. And they want to do this as fast as possible.

MAKING SPEED HAPPEN

Fantastic Data and three other teams—the latter including defense industry stalwarts Orbital ATK Inc., Textron and Northrop Grumman Corp., along with nontraditional subcontractor partners—are trying to develop the GLMR capability in nine months (a very short timeline in the DOD procurement world) and at relatively low cost. The problem is not a simple one, according to Hammel. But it has the U.S. military's attention, which makes all the difference. That wasn't always so.

"We really hadn't had any significant R&D [research and development] funding or any terrain-shaping capability for deep [obstacles] in a long time," Butler said. And funding is everything. "It's been my experience … that it's very difficult to lure industry to the table if there's not a commitment by the government to do something," Hall said.

Butler added, "We had a requirement on the shelf for dominating mobility through terrain-shaping effects." Suddenly it had very high-level attention and "money became available in FY16 to begin the GLMR program," with delivery of an initial operational capability set for 2025.

That proved to be a daunting timeline for such complex work, Butler said, because "we haven't been spending money on the deep part." Rather than go through the efforts that might normally accompany a future Acquisition Category ID program, he said, "We have to go right to industry to get to those ideas," which led to DOTC, the OTAs and, Butler said, the call to industry: " 'Hey, here's our ICD [initial capabilities document] concepts and requirements, what do you have available in industry?' "

GLMR is still pre-milestone A, which means there is time to explore technologies and not get locked into requirements that won't work for the long haul. OTAs provide the flexibility to get into a back-and-forth with industry to look at potential "ilities," as Butler put it, or the "incorporation of all the system development considerations early and not just concept technologies. This is to ensure that we maximize life cycle affordability by considering systems logistics, supply chain, packaging, transportation, cybersecurity, training, demilitarization, etc."

OTAs also allow for things to be done far more rapidly. "We were able within six months to get industry on contract," Butler said. "They developed their concepts based on the requirement we wrote coming out of the Joint Terrain Shaping Working Group."

OTAs also allow industry more involvement in developing realistic and workable requirements based not just on what the Army wants, but also on what industry can do—which the Army might not even be aware of yet.

To that end, Butler said, "We had a classified briefing [to industry] up front, like, 'Hey, here's some of the challenges especially from a cyber and EW [electronic warfare] standpoint,' so that they could have their systems address some of it. But then they brought in their new ideas and technologies."

CONCLUSION

For Jerry Whiteside of Orbital ATK, which has done business with PEO Ammunition for many years, the classified briefing and industry days showed that there was a lot that industry could do that government wasn't aware of and "had things that were very high on the risk register … technically very challenging [things], and within the first few months we demonstrated the ability to address probably the top three or four risks they had on their risk register."

Whiteside said that Orbital ATK has found the more collaborative OTA environment to be a sharp contrast to handing industry a requirement that it may find overly prescriptive. Now, he said, "We are very clear that government is looking for industry to help them lead them, and ourselves—lead the product to as early a fielding as possible."

It's been appealing to collaborate "to develop those requirements, to develop what the ultimate product will look like," Whiteside said. For him and his team, that's a "very positive business relationship between the government and industry."

Hammel, whose Fantastic Data has done much of its work over the last two decades in a DARPA environment with even fewer restrictions than OTA, went a step further, expressing the sense that if competitors could work more closely, perhaps on subsets of the same problem, they might significantly speed the process of coming to the best solution and save the government time and money. But he acknowledged that the wall between competitors is understandable.

As potentially promising as that greater unity of effort sounds, the Army and DOD are not yet at that point with industry. But as they look for more diverse ideas and more sensible ways to acquire more strategically and promote innovation, it could evolve into yet a newer way of thinking.

For more information, go to ***https://www.pica.army.mil/pmccs/AreaDenial/Overview.html#nogo06****.*

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TRY IT THIS WAY

JPEO-CBD's tailored AoA process incorporates user feedback and accounts for the impacts of threat across the joint environment, while allowing it to remove the requirement to identify additional potential solution sets outside of RFI responses. JPEO-CBD has found the risk of eliminating research to be acceptable for programs in well-developed fields with known vendors, and it allows for faster execution of the AoA. (Image by U.S. Army Acquisition Support Center/Nico El Nino/iStock)

RETHINKING *the* ANALYSIS

JPEO-CBD takes a fresh look at the required analysis of alternatives and finds ways to make it a more effective, less time-consuming tool.

by Ms. Breena Berté and Mr. Marshall Kindred

A recent study by the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD) showed that the analyses of alternatives (AoAs) conducted within the Chemical Biological Defense Program (CBDP) listed, on average, 23 measures of effectiveness and 72 measures of performance to be considered before milestone A. The AoA is an essential and required step in establishing the most operationally suitable, cost-effective options to provide a needed, potentially joint capability. But, JPEO-CBD found, attempting to analyze the possible trades among that many factors required significant time and effort without improved results.

In particular, the study concluded that AoAs were taking about 18 months in attempts to collect and analyze an average of 72 measures of performance (MOPs) on every available technology, when, in the end, the JPEO found that it could not collect all those data points. Even after investing the time and resources to collect the necessary data, there were significant gaps in the available information on the cost, schedule and performance of viable alternatives. And because there was no prioritizing of MOPs, the process failed to provide the milestone decision authority (MDA) the information it needed to direct the program toward the most advantageous alternatives.

To move toward an AoA process more attuned to the needs of individual programs, JPEO-CBD is leading an effort across the CBDP to streamline the AoA process for Acquisition Category (ACAT) II and ACAT III programs. The goal is a streamlined, tailored approach that offers program managers and the MDA the precise information needed to make decisions early in the program's life cycle while minimizing wasted time and effort. To this end, the JPEO-CBD has pinpointed areas in the

Joint Capabilities Integration and Development System (JCIDS) process, which focuses on identifying needed capabilities and the associated requirements, that are adaptable while still providing specific enough information for the program to ensure affordability from the beginning.

In general, this information provides broader direction at the program's outset, with more granular analysis added if necessary as the program progresses. For example, at milestone A, it is not possible to do a robust cost analysis or to analyze specific performance parameters because the data are insufficient, but it is possible to establish a rough order of magnitude for cost and performance to guide the program. Customizing the analysis could be as simple as reviewing swatch data early in a program to acquire wearable gear, to guide design by identifying which materials show promise or could reach a higher technology readiness level by the time the program reaches production, rather than running full assessments on all possible materials from the start.

As the Hon. Frank Kendall, undersecretary of defense for acquisition, technology and logistics, has said, "Our world is complex. One-size-fits-all cookbook solutions simply don't work in many cases. … at the end of the day we have to figure out the best course of action in a specific circumstance, balancing all the complex factors that apply to a given situation." Kendall's comments come from his article "Better Buying Power Principles: What Are They?" in the January-February 2016 issue of Defense AT&L magazine.

As the Defense Acquisition Workforce moves to ensure the best value for acquisitions, there has been a push to identify and employ options in DOD Instruction (DODI) 5000.02, Operation of the Defense Acquisition System, for tailoring processes to fit the needs of a program. While there is no prescriptive list of what areas should be tailored, the general tenets of Better Buying Power can be applied to look critically at what adds value to the program. Many of the standard practices in DODI 5000.02 target ACAT I programs, but there are opportunities to customize many areas in our traditional processes for ACAT II and ACAT III programs. ACAT I programs are high-budget, large acquisition programs that come with the highest level of oversight. ACAT II and ACAT III programs have fewer oversight requirements because of their lower budgets, and therefore offer more areas of adaptability from ACAT I regulations.

In fact, DOD 5000.02 explicitly allows room for modification, permitting the MDA to make decisions that produce the right information to move a program forward.

NOT QUITE BY THE BOOK

As the only published document across DOD that prescribes how to execute an AoA, the U.S. Air Force's Analysis of Alternatives (AoA) Handbook has set the standard. The Air Force created this document to outline what is required from an AoA given the complex ACAT I programs that the service manages, requiring a mandatory and explicit approach to issues of safety and risk. However, the

PICKING AND CHOOSING

The tailored AoA approach developed by JPEO-CBD identifies the most relevant factors for the most vigorous early analysis while still providing sufficient information to the MDA. While relevant for larger ACAT I programs, the full AoA process prescribed in the Air Force handbook is an unnecessary obstacle to smooth, rapid execution of lower-budget ACAT II and III programs. (Image courtesy of the authors)

Removing the requirement to identify additional potential solution sets outside of the RFI response allows for faster execution of the AoA, since we are only analyzing alternatives that have shown the maturity and ability to provide a technology to the warfighter.

LAYERS OF ANALYSIS

To make the AoA process more efficient and effective, JPEO-CBD's streamlined approach offers program managers and the MDA the information they need to make informed decisions early in the program's life cycle. The overall approach is to provide broad direction at the beginning of a program and add more detailed analysis as needed in later stages. (Image courtesy of Olivier Le Moal/iStock and the authors)

level of detail required in AoAs for ACAT I programs, such as the F-35 Joint Strike Fighter or the M1 Abrams tank, is usually excessive when dealing with smaller, simpler, lower-budget programs.

The Air Force handbook directs that the AoA be complete before milestone A. The JPEO-CBD's revised AoA process treats the analysis as an evolution of information that will enable the project manager and the MDA to expedite programmatic decisions. This new strategy does not have a set number of required phases, for example. Instead, the initial phase of each AoA will include user feedback, an increased emphasis on threat and using screening criteria to target the most realistic options, along with prioritizing the measures of effectiveness (MOEs) and MOPs that are most relevant early in the program.

This approach envisions additional studies, or phases, as follow-ons to the initial AoA as needed to provide greater specificity of cost, schedule and performance and ensure that the program leadership chooses the alternative that will provide the best product to the warfighter.

The AoA significantly influences all aspects of an acquisition program and is a key input to other acquisition documents, such as the acquisition strategy, systems engineering plan, test and evaluation master plan and particularly the capability development document (CDD). JPEO-CPD's new process provides input to these documents before milestone A. With the standard AoA process taking upward of 18 months on average, previously it had minimal influence on acquisition documents because they were developed before publication of the AoA results. By using this new, phased approach, JPEO-CPD's goal is to provide critical information in intervals of six months or less, allowing for input to key documents from the start of the acquisition process.

KEY FACTORS FOR ANALYSIS

One key component of the new AoA process is soliciting warfighter input immediately after the materiel development decision to assess specific functional needs that will influence design, provide a guide for prioritizing the focus of the program, and address the unique cross-cutting nature of joint solutions.

While those executing the AoA have always requested this information from the combat developers, this new approach aims to add interviews directly with

FOCUS ON THE PRIORITIES

JPEO-CBD pinpointed areas in the JCIDS process that are adaptable while still providing the right information for program decisions, and now uses screening criteria to prioritize the most relevant measures of effectiveness and performance. (Image courtesy of iStock and the authors)

warfighters from all services to capture the wealth of knowledge our joint forces provide.

Early attempts at these interviews have shown some differences between what the combat developers report and what current users are reporting. In one instance, Mission Oriented Protective Posture (MOPP) gear exchange times reported in initial interviews based on actual experience were much higher than were published in doctrine. In another interview, an audience of more than 100 end users asserted that they always had their protective armor on beneath their MOPP gear, whereas requirements reported on behalf of that service stated that troops would be wearing no protective armor while in MOPP gear.

Combining the high-level input with ground-level accounts will maximize the program's relevance to the user and help prioritize MOEs and MOPs based on the concepts of operations (CONOPS) of each service or mission specialty. This also will give insight into whether a solution that overlaps all services is feasible, or if a solution needs to focus on a specific mission area. High-level analysis early in the AoA process thus can reduce the program's timeline by focusing on the highest-priority next steps.

Threat is another key consideration in JPEO-CBD's AoA streamlining. While threat has always been a factor influencing the requirements identified in the CDD, the new process increases the emphasis on incorporating threat into the initial AoA. When providing a joint capability, the threat risks vary from service to service, so understanding the threat that each service faces—in collaboration with our intelligence, requirements, combat development and warfighter communities—is critical in determining how a potential solution closes the capability gap for that service. Various services are willing

to assume different levels of performance risk based on their concepts of employment and their CONOPS, so including threat as an independent variable along with cost, schedule and performance ensures that the AoA provides the necessary information to evaluate when and how to address it.

In a third area of the AoA that JPEO-CBD has found adaptable, traditional AoAs have required the identification of additional technologies for the study report, independent of the requests for information (RFIs) that CBDP project managers release. Often, the RFI respondents are already known to the program, as only a few companies have the technology to fill that particular capability gap. This is because the CBDP is a niche field that relies on close partnerships with government science and technology agencies, industry and academia.

These ongoing partnerships make the additional survey for new technologies redundant. Removing the requirement to identify additional potential solution sets outside of the RFI response allows for faster execution of the AoA, since we are only analyzing alternatives that have shown the maturity and ability to provide a technology to the warfighter.

Although eliminating this research may be a risk, it is one that JPEO-CBD has found acceptable for many programs, especially those in well-developed fields with known vendors. The JPEO would rather pay more immediate attention to determining technology readiness levels and gaining a rough order of magnitude for the anticipated life cycle cost estimates, which will allow for a more robust trade space analysis of the cost, schedule and performance for each of the potential materiel solutions, including a close look at the threat.

CONCLUSION

The new AoA process is a big leap ahead in executing a major step in the acquisition life cycle. Executing an AoA in this way will reinvigorate the traditional approach by encouraging outside-the-box thinking to find better solutions for acquisition programs. Focusing on inputs most vital to program success can reduce the time spent collecting and analyzing information for an ACAT II or ACAT III program. In various memos, policies, white papers and other guidance on best practices, senior leaders across DOD continuously emphasize tailoring and streamlining our acquisition processes. JPEO-CBD has taken this to heart, not only tailoring the standards of the Air Force handbook but also collaboratively identifying areas to further improve the value of the AoA.

For more information on the tailored AoA approach, contact the authors at ***breena.j.berte.civ@mail.mil*** *and* ***marshall.l.kindred2.ctr@mail.mil****. For more information on JPEO-CBD, go to* ***www.jpeocbd.osd.mil****.*

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JPEO-CPD's goal is to provide critical information in intervals of six months or less, allowing for input to key documents from the start of the acquisition process.

ALLP FOSTERS KNOWLEDGE MANAGEMENT

Acquisition is a complex, multiplayer endeavor, and solid acquisition knowledge is generally hard-won. It's worth managing that knowledge carefully, and documenting lessons learned in the portal is one way to do that. (Image by Ellagrin/iStock)

JUST CAALL

A suite of changes to the acquisition lessons learned portal makes it easier to learn from others who've fought similar battles.

by Mr. Steve Stark and Mr. Robert E. Coultas

In April 2016, Karen Price needed guidance on an acquisition procedure that her office had encountered for the first time. Price is a senior logistics management specialist for the Joint Product Office for Elimination, part of the Joint Project Manager for Guardian within the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD). Her office was brand-new at the time, and she reached out to the Center for Army Acquisition Lessons Learned (CAALL), within the U.S. Army Materiel Systems Analysis Activity (AMSAA).

"As they were starting up, they realized they were somewhat similar to a previous program, so they got together with core people from that group to discuss lessons that they had and to make sure that they were aware of those and could avoid" similar mistakes, said Kevin M. Guite, team lead for Army Acquisition Lessons Learned.

Representatives from the other organization, JPEO-CBD's Joint Project Manager for Nuclear, Biological and Chemical Contamination Avoidance (JPM NBC CA), met with Price and her team to share JPM NBC CA's experiences.

"Since we were going down that path, developing products to disable or destroy chemical warfare material," Price said, "we asked if we could get together and take some of the lessons learned that they had throughout the acquisition life cycle."

A COMMUNITY OF KNOWLEDGE

Lt. Gen. Michael E. Williamson, principal military deputy to the ASA(ALT), urges the acquisition community to identify lessons learned and record them in the ALLP. It's one way to mitigate some of the bureaucratic isolation that can hamper the efficient adoption of best practices. (Image by USAASC/exdez/iStock)

NOTHING NEW UNDER THE SUN

While the products may be different, the overall processes of Army acquisition haven't changed much over the years—there probably isn't a new problem, only the same problem in slightly different form. The beauty of lessons learned is not unlike going online to watch a YouTube video to learn how to do macramé or fix a leaking faucet. It's knowledge management. So, whether the challenge is with contracting, cost overruns, scheduling, negotiations or anything else acquisition-related, someone has probably gone through it before. And if that someone has taken the time to write up a lesson learned, it's going to save the next person from having to reinvent the wheel. That's the idea behind the Army Acquisition Lessons Learned Portal (ALLP).

According to Guite, the portal grew out of a recommendation from the 2010 Army Acquisition Review (also known as the Decker-Wagner report), which recommended that the Army should develop a single database that captures "appropriate programs, issues, trends, solutions and successes in acquisition programs." In 2012, then-Army Acquisition Executive Heidi Shyu issued a memo directing that all acquisition category (ACAT) programs conduct after-action reviews (AARs) at major milestone events and program terminations. Those would then be collected in one database to be analyzed, archived and disseminated throughout the acquisition enterprise. The ALLP quickly became the authoritative source of Army acquisition lessons learned.

Interest in the portal was considerable, and Army AL&T began highlighting lessons learned in its Ground Truth column, which quickly became one of the magazine's more popular features.

LESSON APPLIED

Price and her core team met with the JPM NBC CA team representatives and a representative from the CAALL, who captured the lessons for ALLP. Their meeting resulted in a lesson learned on the ALLP portal: LL_1109: Ensuring all stakeholders are integral to the decision-making process is part of the open, honest communication and teamwork essential for successful program execution.

"We talked about the aspects of acquisition: Do you use multiple capability development documents? Where in the timeline did you have pitfalls? What were your biggest cost drivers and delays in your schedule? How did it make your product more effective? And how do you continue to do it in the future? Sharing those kind of lessons was very helpful. We now have developed our schedule to avoid those kinds of pitfalls in the future," Price said.

Price's experience is just one of many success stories of acquisition professionals coming together and finding solutions to challenges encountered on the job by sharing lessons learned on the ALLP. "The whole idea is for programs going through their milestone reviews to not keep making the same mistakes," said Guite. "They [program managers] should be learning from each other and applying lessons that already have been learned."

FLAGGING SUPPORT

Since its inception in 2012, ALLP showed a steady growth of published lessons learned, with usage peaking in 2014 with 304 lessons submitted. However, usage waned after that, dropping to 155 and 49 for 2015 and 2016, respectively.

That decline corresponds to Shyu's departure as assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)). "I think we lost a champion down in ASA(ALT) headquarters," Guite said. "Prior to that, they were pushing for people to make sure they were conducting AARs and collecting lessons learned and pushing them to us. We were sending figures [to ASA(ALT)] to let them know how many accounts we had and lessons coming, and we had slides put into program status reviews and ACAT II program reviews."

Guite said that with Shyu's retirement and the change in operational tempo at ASA(ALT) headquarters, ALLP apparently became less of a concern. "Given that they are busy and have a lot of other things to do," he said, "I think it [ALLP] was low on the priority list."

REDEFINED VISION

That is going to change, thanks to a concentrated effort led by Lt. Gen. Michael E. Williamson, principal military deputy to the ASA(ALT) and Army director, acquisition career management.

Williamson has said many times that lessons learned aren't valuable unless they're lessons applied. To capture what worked or didn't work, pitfalls and success stories, and keep them in one repository to share with the acquisition community is a simple and effective concept. But if they're not applied, they're just words. "We need to share knowledge through a common database that is both user-friendly and useful," Williamson said.

Senior leadership, including Williamson, recently noted an increase in project managers asking for guidance on challenges that they were facing—and many of those challenges had already been solved by someone else in the community and, in some cases, documented on the ALLP. "It was important to address the situation immediately by identifying the problems and finding a workable solution," Williamson said.

An analysis found that the ALLP had become low-profile: Most of the acquisition community was not aware of the portal, return users were scarce, and lessons learned input had plummeted. To address those problems, ASA(ALT) formed a task force to reinvigorate, re-emphasize and reintroduce the portal to all levels of the acquisition community as well as individual users.

"We had our initial brainstorming session, and everyone [agreed that] we have a lessons-applied problem. The site is there; therefore, the site must not be good and nobody's using it. Therefore, we were not having our lessons applied," said Maj. Shannon Thompson, 51A proponency officer for the U.S. Army Acquisition Support Center (USAASC) and team facilitator on the project.

After speaking at length with the site owners, Thompson found they'd been noting deficiencies in usage of the portal for a while. The acquisition community was either not prioritizing submitting lessons or the lessons learned process "was not deemed to be useful, because not enough people were starting the 'movement,' indicating a cultural problem."

"They had collected a lot of data and done surveys," Thompson continued, "and it turns out that the root of the problem isn't so much that the site is not useful. The root of the problem is they can't get folks to feed the system with lessons learned; that then would draw other users to pull those lessons learned and apply them to their particular situation."

Thompson suggested that raising awareness of the lessons learned portal throughout an acquisition officer's career progression would increase its recognition and usage. "If we were to get them at the basic course as captains and junior majors and say, 'Here's this tool [ALLP] out there, and by the way, we're going to do a small module and a practical exercise on how to use this tool,' [we could] make it a part of the community culture."

DON'T REINVENT THE WHEEL: SEARCH THE PORTAL

Recent updates to the lessons learned portal make it easier to search—you can save search terms, see what others in your organization are searching, and bookmark results for later. (Image by Varijanta/iStock)

EASIER ACCESS AHEAD

According to Guite, several technical improvements have been made to the portal. Gaining access to the site is simpler, and navigation has improved, thanks to recent upgrades. "We have redesigned the landing pages [for access] based on the users' account types. So if you're a PEO [program executive office] user, you'll be able to see recent lessons submitted by your organization and some of the searches that people are doing, and bookmark your favorite lessons and documents to get to them quickly."

Other enhancements include a redesigned home page with simplified menus and the capability to see lesson activity occurring throughout the portal, such as recent lessons, as well as the ability to save common search strings that can be quickly recalled and executed in future ALLP sessions. Also under consideration is a proposal to permit contract users to access the entire portal instead of limiting them to inputting lessons only. "We realize that contractors are a valuable asset. They have great experience that we want to capture. That was a restriction we had when we first set up the portal," said Guite. Getting that relaxed, he said, will lead to more users submitting their experiences and research.

Additional efforts are underway that will take advantage of social media features to further ease the exchange of lessons and best practices within the Army acquisition enterprise. Working with ASA(ALT) and the USAASC, the ALLP plans several initiatives to:

- Leverage user forum software to support discovery and sharing of timely acquisition topics;
- Provide access to podcasts and webinars, allowing acquisition experts to disseminate valuable knowledge throughout the community;
- Develop a dynamic contact list to easily identify experts across the acquisition enterprise that can support information exchange on specific acquisition challenges.

CONCLUSION

"Lessons learned [that are] properly documented and analyzed are of enormous value to the acquisition community, and go a long way toward improving the acquisition process," Williamson said. "We just need to focus the mission on the easy sharing of information between those who have the answers based on experience and those searching for them."

With the current budget climate, Guite said, "You've got to do things smarter. You want to make sure you don't repeat the same issues that others have already figured out. So if you can get on [the ALLP] and be smarter with your time and money, hopefully you can get programs out under budget and on schedule."

For more information, go to the Army Acquisition Lessons Learned Portal at ***https://apps.aep.army.mil/ALLP****.*

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LESSON *Up*

Writing up a lesson learned for the ALLP is easy

Is this lesson learned being submitted following a program milestone or termination?

Input yes or no.
If "Yes" is selected above, please indicate which program event occurred. Please refer to the Program Event worksheet for valid choices.

Lesson Learned
Provide a concise, specific, actionable statement that describes the knowledge you gained through this experience that can benefit other programs if shared and reapplied.
(Limit 200 characters)

Background: Describe the events that you observed and/or the actions that you took and why.

Recommendation: Provide details regarding the benefits of the lesson learned and how it can be reapplied in the future to benefit other programs/organizations.

In many respects, the Center for Army Acquisition Lessons Learned could not have made it easier to post a lesson learned. For most people, the biggest issue is assembling all of the documentation required. Then there are two ways to enter a lesson: You can type it directly into the portal or download the form. Upgrades that are in the works include simplifying the process for entering data directly into the portal's form. Whether using the online form or the downloadable template, the information needed is identical and presented in essentially the same format.

The template is in Microsoft Excel format (which may change in the future). That makes it easy for the folks reviewing and posting the lesson learned to import it into the portal's database. The spreadsheet has 10 tabs, the most important of which is the first, the ALL submission form.

The form is simple, with instructions in each box. Many of the areas on the downloadable form are quite straightforward, such as "enter yes or no." The most important parts are the background, which describes the events that created the challenge and how the program overcame the challenge; and the recommendation, which details the benefits of a lesson learned and how it might be applied in other areas. These areas are the real meat of lessons learned, and in many cases what those searching the database for solutions are looking for. That means it's incumbent upon those entering lessons learned to write plainly and clearly.

Cost impact: If this lesson had a positive or negative effect on your program in terms of cost, please try to quantify it and provide the base year used to derive cost savings.

Schedule impact: If this lesson had a positive or negative effect on your program in terms of schedule, please try to quantify it.

Performance impact: If this lesson had a positive or negative effect on your program in terms of performance, please try to quantify it.

Additional comments: Please add any additional comments.

Category: Please choose one or more categories that apply to this lesson. Please refer to the Category worksheet for valid choices. Multiple categories should be separated by a semicolon.

Keywords: Please choose one or more keywords that apply to this lesson. Please refer to the Keywords worksheet for valid choices. Multiple keywords should be separated by a semicolon.

Phase: Please indicate the appropriate phases to which this lesson applies (otherwise choose "Not Applicable"). Please refer to the Phase worksheet for valid choices. Multiple phases should be separated by a semicolon.

Milestone or event: Please indicate the appropriate milestones or acquisition events to which this lesson applies (otherwise choose "Not Applicable"). Please refer to the Milestone worksheet for valid choices. Multiple milestones should be separated by a semicolon.

ACAT: Please indicate the appropriate ACAT level to which this lesson applies. Please refer to the ACAT worksheet for valid choices. Multiple ACATs should be separated by a semicolon.

System: If this lesson was learned within a particular system/program, provide the name of the system (e.g., JLTV, AMPV).

Time of occurrence: If this lesson is linked to a specific time period, please indicate when it occurred.

No specific format is required.

–CENTER FOR ARMY ACQUISITION LESSONS LEARNED

Writing up a lesson learned follows common rules for grammar, syntax, spelling and usage that you'd encounter in any sort of writing. There are, however, a few rules of the road that the ALL portal staff enforces vigorously. A lesson learned is not the place to air grievances, make accusations or show disrespect to other organizations or to contractors, according to Janet O'May, an operations research analyst on the acquisition lessons learned team.

"Sometimes we get a lesson, and it's pristine. There's not a whole lot [to do]. We always check grammar and make sure it reads well and that there's nothing there that shouldn't be there—you're not slamming an organization, you're trying to be helpful. We always check that sort of thing. Last week I got a couple [of] lessons in from PEO Soldier. I had very little to do on those. There was no back-and-forth. Everything was filled out; I had to do a couple of acronym checks, but other than that, they were great.

"Others just have a skeleton of information, so we may be going back and forth four and five times. It depends on how much effort [the organization] puts into it, and whether it provides enough information to be valuable to somebody else." O'May guessed that she and her team have to go back and forth with a lesson's author an average of about three times to get the lesson ready for posting on the portal.

What that means for most portal users is that the team does its best to make sure that providing a lesson learned is as simple as possible. Perfect or imperfect, the team will help make it useful.

—MR. STEVE STARK

Unintended Benefits

USASAC's FMS efforts around the world benefit warfighters, industry and the defense acquisition community closer to home.

Like its embattled cousin acquisition reform, strategic acquisition faces long-standing challenges, among them navigating a complex, billion-dollar bureaucracy. As experts debate ways to perfect the defense acquisition process, one Alabama-based command is making an impact close to home with an international approach.

The U.S. Army Security Assistance Command (USASAC) at Redstone Arsenal, Alabama, manages security assistance programs and $176 billion in foreign military sales (FMS) cases. With support from DOD agencies, American industry and its higher headquarters, the U.S. Army Materiel Command, USASAC provides materiel, training and other services to help 150 allied nations and organizations strengthen their defense capabilities. Those efforts help achieve regional stability and international security—and also bolster the acquisition community through partner nation investments.

"Take, for example, a partner nation that is funding an FMS case. If they discover they need a technology augmented because they're fighting in a certain terrain or under particular circumstances, they may request we enhance a piece of equipment or technology," said Sean Hicks, a USASAC country program manager who oversees cases for several Middle Eastern nations. At the country's request, a portion of its FMS funds is diverted to help fund the research and development (R&D) of the desired enhancement, Hicks explained.

"Now we have this upgrade that, in some cases, the United States would have developed sooner or later, but it wasn't a driving force at that moment," he said. "The partner nation is now a co-investor in the new technology, and we both win because we are fielding a technology much sooner than expected, at a much lower cost due to the shared investment, and it is a technology that will improve the U.S. mission and the safety of our warfighters." And, although the U.S. government and partner nation share the R&D costs, Hicks noted, both the original and upgraded technology remain the intellectual property of the United States.

Partner nations can also benefit, said Hicks, in one of two ways: The United States can reimburse them for their investment, or other nations may offer to pay for use of the new technology.

BOOSTING THE BASE

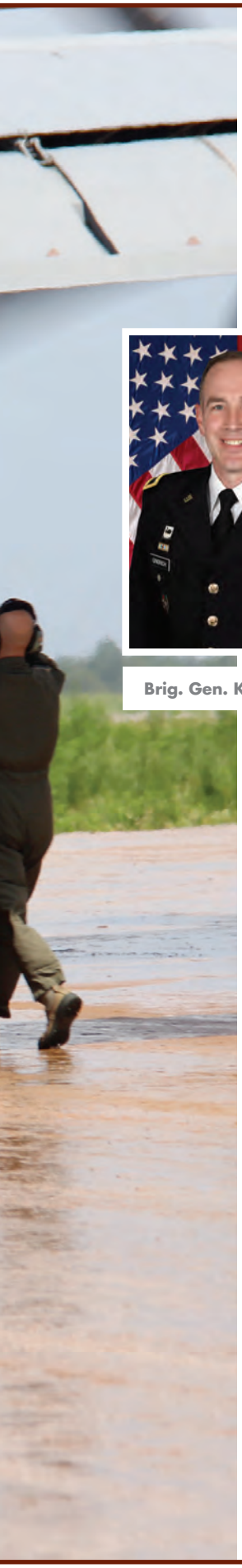
Additionally, partner-invested enhancements can mitigate workload shortages and sustain the expertise of industry workers during peacetime across the 23 depots, arsenals and ammunition plants that make up the Army's organic industrial base (OIB).

The Army's OIB is vital to Soldier readiness, said Maj. Gen. Stephen E. Farmen, the USASAC commander. "It is a national security readiness insurance policy and has to be there—up and running—the moment we need it." The OIB allows the United States to build and reset weapon systems quickly and decisively, not at the civilian sector's pace, which is hindered by a sometimes sluggish contracting process. During Operations Enduring Freedom and Iraqi Freedom, the OIB reset nearly 4 million items, a workload three times that of the Vietnam War. Since 2003, the reset workload has constituted more than $29 billion in Army equipment and more than $5.7 billion in equipment for the Air Force, Marine Corps and Navy.

FMS also benefits Army acquisition through economies of scale: The United States is able to purchase equipment at lower per-unit cost as the order size increases. "It costs less and less to produce more and more," said Hicks, adding, "At the end of the day, the positive impact of FMS has a wide reach—and not only from a national security and partner nation standpoint, but also from an OIB, industry, fiscal and acquisition standpoint."

—MS. ADRIANE ELLIOT, USASAC PUBLIC AFFAIRS

COMMUNICATIONS TO GO
The Army is providing lighter, more transportable configurations of its tactical communications network backbone, including the air-transportable High Mobility Multipurpose Wheeled Vehicle used here by the 3rd Brigade Combat Team of the 82nd Airborne Division during its recent Joint Readiness Training Center (JRTC) rotation at Fort Polk, Louisiana. The Point of Presence, shown here being unloaded from an aircraft, enables connectivity so that commanders can receive mobile mission command, including a near-real-time common operating picture from anywhere on the battlefield. (U.S. Army photo by JRTC/Fort Polk Public Affairs)



Meeting in the MIDDLE

Brig. Gen. Karl Gingrich

Brig. Gen. Karl Gingrich looks at acquisition through the eyes of an operations research analyst to bring clarity to the readiness, fielding and operations of the Army's tactical network.

by Ms. Nancy Jones-Bonbrest

It's a matter of perspective.

To ensure that the tactical network enables the readiness of operational forces, the Army must have a ready network to support them. Yet a ready network does not come solely from meeting materiel needs for better technologies. Instead, it also includes the other side of the coin: institutional readiness to put those technologies into play on the battlefield. After all, the Army can field the latest and greatest network equipment, but if Soldiers are not adequately trained or do not have the proper amount of time to train, their willingness to use it will diminish.

Listening to Soldier feedback and lessons learned, the Army is tackling both aspects. Industry partners have heard the call to make capabilities less complex, to deliver interfaces with a common look and feel, and to include simplified network management tools and initialization processes up front. To amplify those efforts, the Army is building Soldier proficiency and training that were sacrificed during back-to-back wars.

Approaching the problem from both directions—and meeting somewhere in the middle—will get the Army closer to the sweet spot, where Soldiers get the simplified and standardized technology they're asking for, as well as the time needed to train on the network as an integrated weapons system.

In an attempt to approach these complexities from a unique angle, Brig. Gen. Karl Gingrich, the new assistant program executive officer for command, control and communications – tactical (APEO C3T) for operations, readiness and fielding, is serving

as the "face" of the program executive office (PEO) to operational Army units.

Not an acquisition officer by trade, Gingrich comes to PEO C3T after serving as the director of resource management/G-8 for the U.S. Army Installation Management Command. Now, as the PEO C3T point person to work on complex issues of network modernization across the operational force and with Army partners such as the Forces Command (FORSCOM), Training and Doctrine Command, Army Materiel Command and Army Cyber Command, Gingrich is focused on the goal of readiness in the field.

Gingrich provided his perspective on his new role, what feedback he's gathered and how to implement changes so that the Army—and its network—is better positioned to ensure readiness, during a Q&A discussion in October 2016.

AWARENESS ACROSS THE BATTLEFIELD

The 3rd Brigade Combat Team, 82nd Airborne Division held its decisive action training exercise in October 2016 at the JRTC rotation at Fort Polk. Training included operational missions using the latest network-equipped vehicles, radios and mission command capabilities to provide on-the-move communications and enable advanced situational awareness. (U.S. Army photo by Nancy Jones-Bonbrest, PEO C3T)

What are the recurring themes you are hearing from the field when it comes to operating the network?

Smaller, faster, simpler, standardized and more capability—that's what everyone wants. That's what the Soldiers are asking for. If that's what they want and what we are giving them today is not meeting that, then they will be unwilling to learn how to use the system, they will not operate it to its fullest capability and their mission will be degraded. That is the challenge we are faced with today. One of the key factors is complexity. Soldier training time is a finite commodity, and often we are hearing that they don't have enough time to complete training requirements. When they do get trained on the newest equipment, they often PCS [permanent change of station] to a unit with older equipment, and that knowledge base is lost. Also, as the Army continues to field the network to lower echelons, signal Soldiers—who are at the heart of operating this equipment—are in greater demand and not always found at the company or platoon level.

We didn't get where we are overnight. We've gotten here because units are used to contractor support and they've lost the ability to do some of the basics. We were at war for almost a decade and a half. All of the Soldiers who grew up in the '80s and '90s understand the garrison Army and how we had to train ourselves and manage ourselves and manage our supplies. Then, when we went to war and went to the ARFORGEN [Army Force Generation] readiness model and we were doing one-to-one rotations or less (one year deployed, one year at home), all of that knowledge and skills atrophied. Were you going to send your Soldiers home at night, or were you going to keep them late to do a quarterly training brief, knowing they were going right back to Afghanistan or Iraq, right back to the same neighborhoods they were in less than a year ago?

So we got out of that business. We got out of the business of taking our kit with us, and we created theater-provided equipment. We lost that unit-level maintenance capability because of that, and with it we created a customer type of environment instead of an owner type of environment. Woe be to the company commander whose equipment wasn't ready in the '80s and '90s. You were vilified if it wasn't in working order. So what we're going through right now as an Army is that cultural change to get back to fundamentals. We are relearning how we do training management and unit maintenance. There's a lot that we have left to do,

and I use the term "cultural" specifically because it's going to take us time.

What can industry do to support that?

A lot of what we're doing now is organizing our field service support. Who does the unit go to if they need help? Right now, they go to whoever is in civilian clothes walking beside them at the combat training centers (CTCs) or in the motor pool. We're looking at not only how to organize that structure to make sure the unit readiness is supported adequately, but that the support is also streamlined and optimized. A lot of this comes down to training.

During CTC rotations, 95 percent of the trouble tickets that are coming in are user-level issues that could be handled by the Soldier, such as basic troubleshooting procedures and user-level maintenance tasks. Of those, 75 percent should have been addressed through training. So we need industry to look at their training packages and streamline them. It currently takes us 24 weeks to do new equipment training/new equipment fielding [NET/NEF]. We have to get better at that.

We are approaching this challenge from both sides right now. Materiel developers who are designing the next communication or mission command system need to stay focused on smaller, simpler and standardized. However, given the timelines for new capability development, this will take some time to affect unit readiness.

ON THE ROBOT'S TRAIL

Sgt. 1st Class Kyle R. Kinard, U.S. Army Training and Doctrine Command capabilities manager for explosive ordnance disposal, walks with a project site manager as they assess the capabilities of the Andros FX unmanned ground vehicle before the Army Warfighting Assessment (AWA) 17.1 in October 2016 at Fort Bliss, Texas. AWA allows industry engineers to work side by side with Soldiers to rapidly correct and improve capabilities. (U.S. Army photo by Staff Sgt. Cashmere Jefferson, 7th Mobile Public Affairs Detachment)

At the same time, we need to ensure that there are multiple opportunities, venues and means for units to train at home station and not rely so heavily on NET or the formal schoolhouse. You either make it simple on the front end when you field a piece of kit, or you pay for it on the back end with training. So we missed the front end on some of our currently fielded equipment. What we are asking industry to do, as we move forward developing capabilities, is: Don't forget simple, smaller, standardized and faster.

You've been in your new position as APEO since June. What unique perspective do you bring to the world of acquisition?

I had little preconceived notion of PEO C3T prior to arriving, other than that the PEO was providing connectivity and integration of the various programs within the portfolio to enable mission command at all echelons. Acquiring the capabilities the Army requires is extremely challenging given the complexity of the technology and the constant evolution of commercial capabilities. An even greater challenge is transferring these capabilities and technology to the operational force and ensuring their readiness.

This work is complex and data intensive. Those themes—data, complexity and operational environment—are why I'm here. The Army seized on the opportunity to leverage the operations research skills of one of its general officers while also exposing him to the broader acquisition community. What I bring is a comfort level with data, a comfort level with complexity. What we do for the Army is critical or structured thinking, helping leaders synthesize meaning from the data and clearly communicating that meaning in support of decisions.

You serve as the "face" of PEO C3T to the operational forces. What does that mean to you?

What that means to me is that rather than a series of individual project managers interfacing with the field, the program executive office is now taking on a role within that discussion. Because I'm a general officer, it allows us to now participate more readily and interact with senior leaders across the Army to help work some of these complex issues of network modernization. It starts to answer [the question], "Are we supporting the readiness of the field in the best possible way?" A civilian can absolutely do this job, but it's a little bit different when you have a military officer talking with operational commanders and leaders. Another important aspect is that as we interface with the field, it is not just what PEO C3T can do to support readiness, but also what our mission partners [the U.S. Army Communications-Electronics Command, Communications-Electronics Research, Development and Engineering Center, etc.] can do in support as well—this is a team sport.

A lot of what is fielded relates directly to the requirements. Any general thoughts on requirements?

Over the past couple of years, we have seen probably a bit more friction between the requirements side of the Army versus the acquisition side, and that's not appropriate. It's not healthy. Honestly, part of the acquisition reform the Army is undertaking under the leadership of the secretary of the Army and chief of staff is really getting back to the basics of the requirements community focused on the requirements and working them through their channels, and the acquisition community focusing on acquiring and procuring those capabilities based on those requirements. It's almost disciplining the system. When we were at war, lines blurred because we were trying to do the very best we could as fast as we could, and that line between requirements and acquisition turned from black and white to gray. Now we need to separate them, and we need to make sure it's a healthy separation.

I'm not suggesting this is done in a vacuum; there still has to be dialogue. The requirements community can draft better requirements when supported closely by acquisition professionals. Likewise, the acquisition community can make better program decisions when working collaboratively with the requirements community. I think that is another niche I fill, in helping to bridge that gap, helping to make sure that there are productive lines of communication.

A QUESTION OF BALANCE

Brig. Gen. Karl Gingrich, who served on a fielding and sustainment panel hosted by the Armed Forces Communications & Electronics Association–Aberdeen Proving Ground, Maryland, chapter, in September 2016, says that simplicity in communications technology is key: The simpler the equipment is, the less time it will take to train Soldiers on it. (U.S. Army photo by Nancy Jones-Bonbrest, PEO C3T)

What we're going through right now as an Army is that cultural change to get back to fundamentals. We are relearning how we do training management and unit maintenance.

RESCUE TRAINING

U.S. Special Forces Soldiers conduct a downed-pilot simulation for the AWA 17.1 exercise at Fort Bliss in October 2016. The simulation was conducted using new gear to assess operational effectiveness. (U.S. Army photo by Pfc. Alexander Holmes, 55th Combat Camera)

Is there anything you would like to add?

Again, this is a team sport. In addition to taking a look at ourselves, our requirements and what we are doing today in support of readiness, we're now opening the aperture and looking more holistically at training from initial entry to deployed environment. Gary Martin, the program executive officer for C3T, has established a series of home-on-home engagements with our institutional partners at the [the Signal School at the U.S. Army Cyber Center of Excellence at Fort Gordon, Georgia] to ensure that we are synchronized and optimized with respect to individual and collective training. We want our Soldiers to arrive at their unit trained on the equipment they will use. By looking at training all the way back to the institution and ensuring that it is in line with what we are fielding on the front end, we can get out of the cycle we are currently in. We are looking at the various home station mission command initiatives that will include our capabilities at installations aligned to our divisions and headquarters, to allow Soldiers to have an instantiation of their systems on hand. This way they wouldn't have to pull everything out of the motor pool to train, but instead would have a standing suite of capabilities. We are cutting the NET/NEF timeline by weeks and encouraging FORSCOM [U.S. Army Forces Command] to provide units with more time between fielding and their CTC rotation. We've stood up an advanced user course, published a quick reference guide, and are working closely with the mission training centers to target training. There are many training opportunities out there, and we need to make sure Soldiers and leaders are aware of them.

For more information, go to the PEO C3T website at ***http://peoc3t.army.mil/c3t/*** *or contact the PEO C3T Public Affairs Office at 443-395-6489.*

MS. NANCY JONES-BONBREST is a staff writer for Data Systems Analysts Inc., providing contract support to PEO C3T. She holds a B.S. in journalism from the University of Maryland, College Park. She has covered the Army's tactical network for several years, including multiple training and testing events.

CHESS HAS ANOTHER MOVE

Reverse auctions turn sellers into bidders and drive competition.

by Ms. Stacy Watson

REVERSE AUCTIONS, IN BRIEF

The author, shown here briefing the capabilities of CHESS's reverse auction platform at Fort Belvoir, Virginia, in July 2016, says it is a valuable tool for obtaining the best prices on commodities. The platform also allows government subject matter experts to maintain direct oversight as vendors bid to provide a service, software or hardware. (Photos by Tricia Shelley, CHESS Public Affairs)

In January 2016, Computer Hardware, Enterprise Software and Solutions (CHESS) launched its reverse auction capability through the CHESS IT e-mart website, designed to drive down the total cost of acquisition and increase savings for buyers. A reverse auction is a method of procurement in which the roles of buyer and seller are reversed to lower prices by increasing competition among vendors.

In a traditional auction, buyers compete with one another by offering higher prices to purchase an item from a seller. In a reverse auction, the sellers compete with one another by offering lower prices to sell an item to the buyer. When the market is booming and demand is high, vendors will compete more directly for the ability to sell to the government. When the market is slow and there are fewer opportunities, vendors will battle one another to offer the lowest bid each time. This approach to the procurement process supports Better Buying Power principles and the Army's initiative to increase competition and drive costs down.

CHESS, part of the Program Executive Office for Enterprise Information Systems, is the Army's designated primary source for commercial off-the-shelf (COTS) information technology (IT), leveraging the buying power of the Army to offer streamlined acquisition vehicles open to DOD, federal and Army customers. CHESS provides a no-fee, flexible procurement strategy through which an Army customer may request quotes or proposals for COTS IT hardware, such as laptops and desktops; software products, from desktop office applications to modeling and simulation software for engineering projects; and IT services, such as program management and database administration. All of this is hosted on the CHESS IT e-mart (**https://chess.army.mil/**).

HOW IT WORKS

Ordering on all CHESS contracts is decentralized, meaning CHESS does not initiate or develop delivery orders. Instead, these functions are carried out by the requiring activities or their local contracting office, who submit requests and place orders directly with vendors based on their own unique needs. CHESS acts as a mediator and provides guidance to the contracting office, the vendors and the customers as needed.

Say a customer needs to order 100 printers for the office. The CHESS IT e-mart serves as the marketplace for the customer and vendor to meet. The customer submits a request for quote (RFQ) or request for proposal (RFP) to CHESS vendors through the RFx Tool on the IT e-mart. CHESS vendors then respond to the RFQ or RFP with a bid: the price at which they are willing to sell 100 printers.

This is where a reverse auction becomes a valuable tool for obtaining the best prices on commodities. In a conventional auction, a seller places an item for sale and buyers place higher and higher bids until the close of the auction, at which time the item goes to the highest bidder. A reverse auction does the opposite. The buyer submits an RFQ for an item required, and the sellers place bids for the price at which they are willing to sell that item. Rather than submitting only one bid in a regular RFQ, offerors have the opportunity to lower their prices based on new bids from the other vendors in a competitive, dynamic bidding process until the auction closes. The reverse auction process offers the ability to conduct robust, real-time price competitions. Rounds of bidding typically start out slowly, but as the bid deadline draws closer, bidding activity increases. This type of bidding leads to continuous price reduction and strengthens competition.

Before the January 2016 launch of CHESS's reverse auction capability, there were only two platforms for Army users to conduct reverse auctions: one operated by a commercial vendor, FedBid Inc., and one by the U.S. General Services Administration. Their platforms are designed to help contracting officers and agencies identify the proper contract vehicles for their requirements and receive the best value possible for their procurement needs. These platforms support a wide variety of supplies and services for the federal government—not just IT requirements.

IMPLEMENTATION

With reverse auction spending goals established for Army users and the continuing popularity of reverse auction as a procurement method continuing, CHESS vendors already were competing for IT requirements, but on third-party platforms that assessed a fee. Seeing a need for more direct Army oversight of IT reverse auctions previously conducted through a third party, and to further cut procurement costs, CHESS stepped into the reverse auction field. CHESS's reverse auction capability focuses on IT hardware and software and complements existing platforms. The CHESS reverse auction capability makes possible real-time price competitions for IT hardware and software, without any CHESS fees, and is hosted on the same website as the IT contracts themselves.

CHESS saw an opportunity for cost savings in the increasing number of RFQs flowing through the IT e-mart. The RFQ tool hosted on CHESS, designed with the decentralized ordering on CHESS's contracts in mind, allows customers to submit RFQs to vendors on specific contracts and view the requirement description, vendor responses and any questions in one place. The selection menus and options route a customer to the appropriate contract and require that the information typically needed for a legitimate quote be filled out. For example, a customer who needs to order printers would select the Printers from the Product Category drop-down menu. The RFQ tool would then direct the customer to the Army Desktop and Mobile Computing-2 contract, which covers commodity purchases of COTS hardware such as printers, and select all vendors from the contract.

The CHESS technical team developed the reverse auction platform using the existing framework of the CHESS RFQ tool familiar to Army customers, providing customers with the same user-friendly experience as submitting an RFQ. Through the reverse auction process, users can solicit quotes from vendors to compete with alternating lower-priced bids from the CHESS contracts. Products available include commodity IT hardware such as laptops, desktops, monitors and printers and a wide variety of software, such as multimedia and design tools, that are guaranteed to have a certificate of networthiness granting approval to run on the Army network.

VALUE ADDED

The ability to provide an efficient, cost-effective, IT-focused alternative to Army customers sets the CHESS reverse auction apart from other reverse auction platforms. Because there's no fee for using CHESS's reverse auction capability, Army customers who have used it have achieved significant savings. From its deployment in January 2016 through September 2016, the CHESS reverse auction capability processed 153 auctions resulting in cost avoidance estimated at more than $2.5 million (calculated

by comparing the initial bid to the lowest bid; this number does not take into account fee savings).

In addition to cost avoidance, the advantage of using CHESS's reverse auction capability is direct Army oversight of the entire reverse auction from submission to auction close, resulting in reduced lead time from solicitation to award. Contracts available through the CHESS reverse auction capability are managed by CHESS product leaders—contracts experts in the field who know the market and the customer and directly manage the administration of the contracts and relationships with both customers and vendors—and CHESS's contracting office, Army Contracting Command – Rock Island, Illinois. Customers have direct access to the product leaders that oversee each contract should any issues arise.

CONCLUSION

CHESS's reverse auction capability is a prime example of making acquisition more efficient and economical. It provides continuous vendor competition for best value to maximize cost avoidance and support the Army's buying power. It is a cost-effective procurement method for Army customers to meet their reverse auction goals and lower COTS IT procurement costs. The reverse auction capability continues CHESS's dedication to innovation and capability advancements, and to providing competitive contracts that offer economical, value-added and networthy IT products.

For more information on CHESS and the reverse auction, go to the CHESS IT e-mart at ***https://chess.army.mil/*** *or contact the CHESS Customer Support Center at* ***armychess@mail.mil*** *or 888-232-4405.*

MS. STACY WATSON is the Enterprise Solutions Division director for CHESS at Fort Belvoir. She previously served as the Women-Owned Small Business program manager for the Army Office of Small Business. She holds a B.S. in business administration with a concentration in procurement and logistics from Alabama Agricultural and Mechanical University. She is a member of the Army Acquisition Corps, and is Level III certified in contracting and Level II certified in program management.

MAKING IT WORK

Jerry Warden, left, and Cortland Polk, members of the CHESS technical team, discuss the reverse auction platform and its capabilities. The capability was deployed on the CHESS IT e-mart in January 2016 and has processed over 153 auctions since its inception.

OFFICIAL POLICY ENCOURAGES USE OF REVERSE AUCTIONS

The Army is increasingly encouraging the use of reverse auctions while giving contracting offices reverse auction spending goals for simple, fixed-price supplies and commercial services procurements, as reverse auction policy recently issued by the Office of Federal Procurement Policy (OFPP) and the deputy assistant secretary of the Army for procurement (DASA(P)) policy make clear. The U.S. Government Accountability Office published a report in December 2013 noting the increased use of the reverse auction at a number of agencies, leading to the recommendation that the OFPP issue guidance to help ensure that agencies capture savings. In accordance with OFPP and DASA(P), a U.S. Army Contracting Command memo released in February 2013 outlined reverse auction goals for contracting offices at the following levels:

- 25 percent use of reverse auction for continental United States (CONUS) actions that involve firm-fixed-price supplies and commercial services with a dollar value greater than $15,000 and less than or equal to $150,000.
- 10 percent of CONUS actions for supplies and commercial services that have a value greater than $150,000 and less than or equal to $6.5 million.

Need to meet your reverse auction goal?

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REVERSE AUCTION

capability via the CHESS IT e-mart with **NO FEE!**

The Ideal Option for Lowering COTS IT Procurement Costs

For additional questions or to attend a reverse auction training, contact
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ARMY CHESS
COMPUTER HARDWARE, ENTERPRISE SOFTWARE AND SOLUTIONS

CHESS is the Army's designated primary source for commercial I.T.
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SYSTEMIZING COTS IT

New initiative leverages the standard Army supply system to support COTS IT within the C4ISR domain.

by Mr. Dan J. Quinn, Mr. Allen J. Hardison and Chief Warrant Officer 5 Ernest "Joe" Sylvester

READY FOR ACTION

AFATDS, a joint and coalition forces fire support command and control system, is transitioning into the standard Army supply system used for weapon system repairs. (U.S. Army photos)

The Army's standard supply system is the well-established backbone for requisitioning replacement parts and returning unserviceable items for repair. Yet, for commercial off-the-shelf information technology (COTS IT) Army units are directed to go outside the normal logistics system.

This often requires units to contact the original equipment manufacturer or vendor to find out if the COTS IT component, such as a laptop, is still under warranty. In addition, every warranty differs. Units often must pay for add-ons such as packaging, handling, shipping and transportation and, if the item is no longer under warranty, for the item's repair. This ad hoc commercial repair process may be lengthy, provides little prioritization and does not track system readiness. Most importantly, this process is not easily replicated on the battlefield.

With the goal of improving unit and system readiness, an initiative is underway that will leverage the standard Army supply system to support COTS IT within the command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) domain.

This new initiative, between the U.S. Army Communications-Electronics Command (CECOM) and the Program Executive

Office for Command, Control and Communications – Tactical (PEO C3T), will move C4ISR COTS IT systems into the standard Army supply system by FY18. The move will significantly simplify the process for Soldiers, by making use of a system they already know and use regularly.

BACK TO CENTER

In the 2000s, when new digital capabilities and systems first flowed into Afghanistan and Iraq during Operations Enduring Freedom and Iraqi Freedom, the Army stood up and financed contractor regional support centers to meet the demand for replacement parts and repairs. Soldiers could quickly put in work orders for repair of C4ISR COTS IT on-site. It was an effective and immediate solution.

Since then, with the drawdown of forces in the Middle East, many of the regional support centers there have closed, leaving deployed Soldiers without easy access to repair parts and spares. Although much of COTS IT hardware is under warranty, the process of using it is often convoluted, placing the burden of leveraging and managing the warranty on the unit. That can reduce the system's readiness when Soldiers are required to manage the warranty actions for items that are not covered because of expired warranties or when damages are considered "other than fair wear and tear," resulting in lengthy turnaround times for replacement parts and repairs.

In many cases, it would be significantly simpler, and therefore faster, to turn in a COTS item and requisition parts or service through the standard supply system that Soldiers use for other weapon systems. The Army supply system, which leverages both unit-level resources and depots for repairs and replacements, also prioritizes requisitions based on the unit's mission and urgency of need. In contrast, a warranty simply satisfies the terms of a contract without regard to priorities among units and equipment.

CONTROL WELL IN HAND

PFEDS, used by forward observers and fire support teams to transmit and receive fires support messages, is one of many mission command systems that could transition into the standard Army supply system.

Furthermore, program managers and sustaining organizations must consider structuring warranties in a way that provides insights into the execution of the warranty program, to make it possible to assess sustainment support options beyond the initial warranty provisions (i.e., whether to extend the warranties or fund repair services based on failure and repair data collected during initial warranty periods).

These efforts are linked to the Army's goal of reducing reliance on contractor logistics support by training Soldiers to serve as the first line of defense for field maintenance. Requiring Soldiers to manage time-consuming warranties reduces the pace of battle and places undue burden on them. Feedback from the field indicates that Soldiers want to maintain C4ISR COTS IT systems in the same way they do their other weapon systems. They want to use a singular organic logistics system and simply push a button to order the repair part they need and receive it in a timely manner.

DEPOT REPAIR AND MAINTENANCE

Force XXI Battle Command Brigade and Below Blue Force Tracking (FBCB2/BFT) is the Army's premier command and control and situational awareness capability at the tactical level and on-the-move. Currently, FBCB2/BFT components and repair parts are supported by the standard Army supply system and repaired by Tobyhanna Army Depot, Pennsylvania. While FBCB2/BFT components are not

This ad hoc commercial repair process may be lengthy, provides little prioritization and does not track system readiness. Most importantly, this process is not easily replicated on the battlefield.

ANTICIPATION

With the goal of improving unit and system readiness, an initiative is now underway that will leverage the standard Army supply system to support COTS IT within the C4ISR domain.

COTS IT, these components are considered "modified" COTS IT repair parts and include such things as integrated circuit cards, which transitioned well into the standard supply system.

To set FBCB2/BFT support up for success, the Project Manager (PM) for Joint Battle Command – Platform (JBC-P) issued spares to the tactical supply support activities during total package fielding. Also, depot maintenance technical manuals, training support packages and test fixtures were developed, and depot technicians were trained. This traditional supply support and depot repair model is now being replicated for JBC-P, the latest incarnation of FBC2/BFT. This model will be leveraged and replicated to also transition C4ISR COTS IT systems into the standard supply support system and depot repairs.

Already, CECOM and PEO C3T have moved COTS IT "consumable" repair parts such as cables and peripherals into the standard Army supply system, supported by the Defense Logistics Agency. The next step will be to move COTS IT "repairable" equipment such as hand-held devices, laptops and server components into the standard Army supply system supported by CECOM.

GETTING IT RIGHT

PEO C3T's Product Manager for Fires Support Command and Control (FSC2), working hand in hand with CECOM, anticipates all its systems will be in the standard Army supply system within the next 24 months. The capabilities leading the pack from FSC2 include the Pocket Sized Forward Entry Device (PFEDS) used by forward observers to capture target data and pass it to the fire support officer; the Advanced Field Artillery Tactical Data System (AFATDS), which provides fully automated support for planning, coordinating, controlling and executing fires and effects such as mortars, field artillery cannons, rockets and missiles, and close air support; and CENTAUR, a lightweight hand-held device that calculates indirect fires data. Not far behind are the systems within the Product Manager for Strategic Mission Command portfolio, including the Command Post of the Future, an automated system that enables the warfighter to visualize the battlefield and plan missions. In FY19, when the Command Post Computing Environment—part of the Army's larger move to a common infrastructure known as the Common Operating Environment—is fielded, it will debut as part of the standard supply system.

To address the consistent challenge of complexity, PEO C3T, which is responsible for developing and fielding many C4ISR capabilities, and CECOM, which is responsible for the sustainment of C4ISR capabilities, are using lessons learned and attempting to stay ahead of the new logistics processes the Army is implementing.

For example, the move to transition COTS IT hardware into the standard system falls in line with the Global Combat Support System – Army (GCSS-A), which is fielding now and will integrate all supply, maintenance, property and tactical finance data into a single automated

system. This system is expected to revolutionize the way the sustainment community supports the Army as it provides improved accountability, accuracy and timeliness and enables economies of scale. The standard Army supply system will be folded into GCSS-A. Making COTS IT already part of that system will enable better management, oversight and tracking, not to mention lessening the burden on Soldiers.

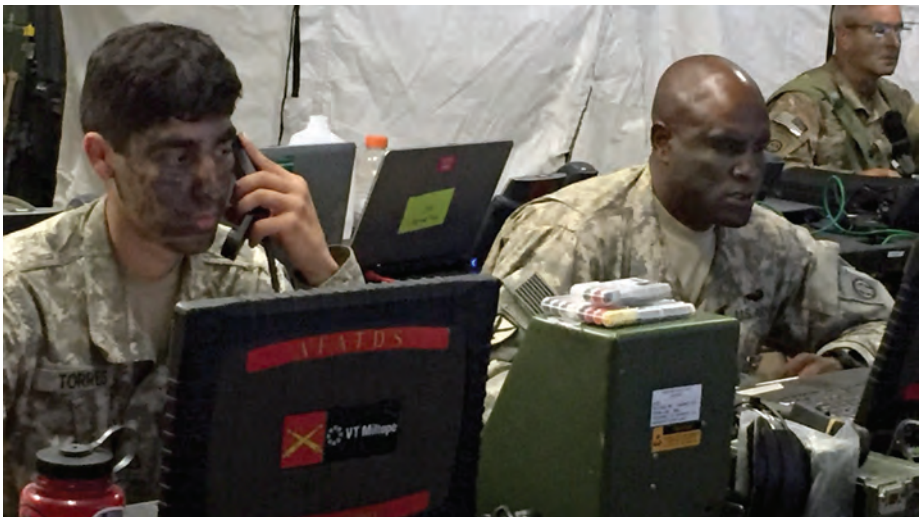
Another critical element for integrated product support is technical data with the objective to identify, plan, resource and implement management actions. The ultimate goals are to operate, install, maintain and train on the equipment to maximize its effectiveness and availability; effectively catalog and acquire spare and repair parts, support equipment, and all classes of supply; and define the system's hardware and software configuration baselines to effectively support the warfighter with the best capability at the time it is needed. Without technical data, hardware sustainment can't function. A lesson learned when procuring COTS IT is the need for project managers to acquire the appropriate technical data and technical documentation to enable provisioning of repair parts in the standard Army supply system.

CONCLUSION

While COTS IT presents a unique set of challenges for organic item management, using proven and standard practices at the unit level that Soldiers are familiar with, coupled with creative solutions at the depot level, could be an effective and efficient solution.

In the past 12 years alone, more than 1 million pieces of COTS IT hardware have been pushed to the field. With sustainment accounting for nearly three-quarters of the lifetime costs for a weapon system, total life cycle system management must be thought through before the first piece of equipment is ever fielded. Shortcuts in the beginning of the life cycle can cause havoc on the back end when sustainment kicks in. By forging strong partnerships and reaching across the aisle while embracing smart approaches between the acquisition and sustainment communities, the Army will meet the challenge of lessening the burden on Soldiers at the same time it is equipping them with next-generation communication technologies.

For more information, go to PEO C3T's website at ***http://peoc3t.army.mil/c3t/*** *or the CECOM website at* ***https://www.army.mil/cecom****.*



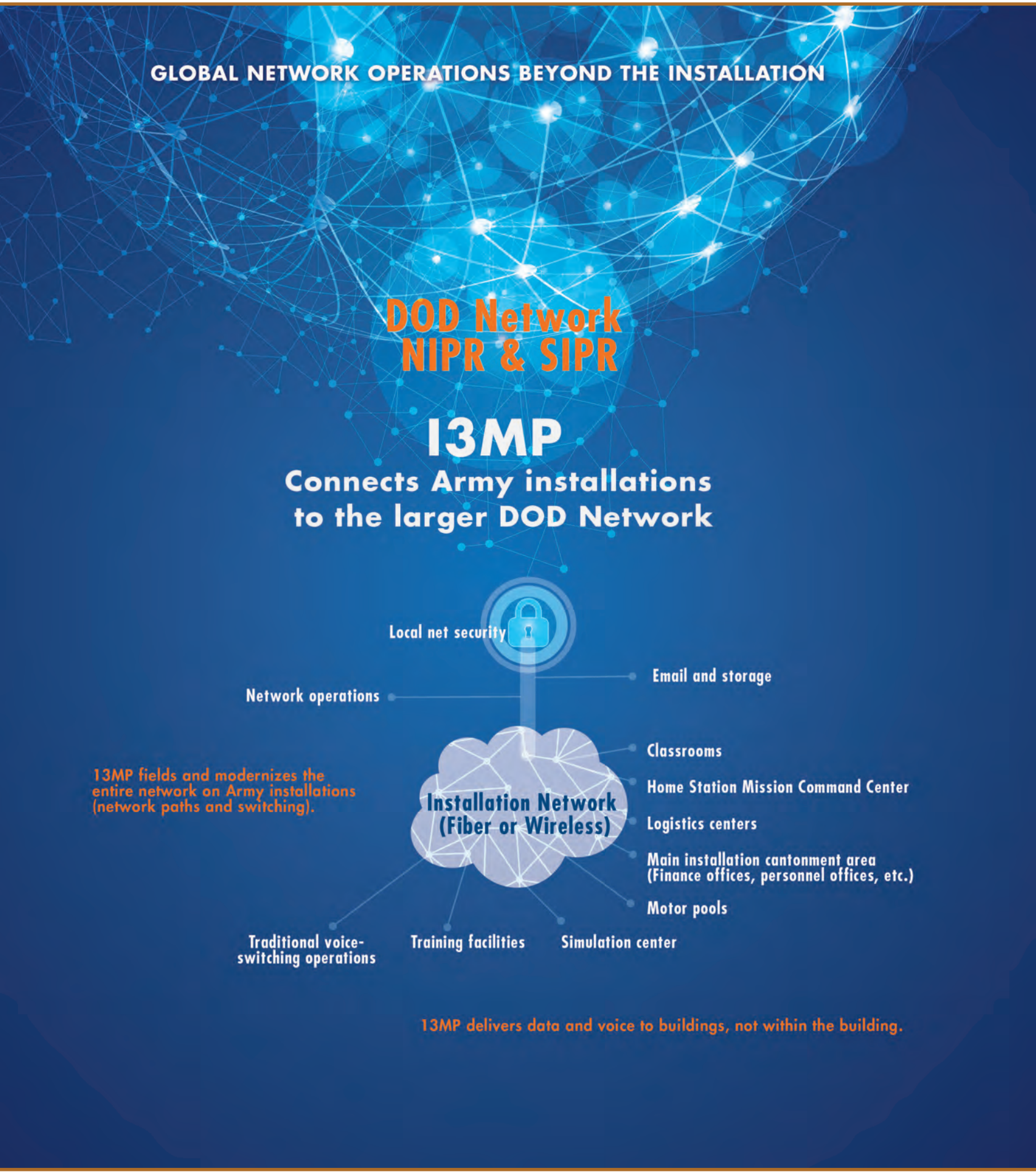
ALWAYS VIGILANT

The Army's well-established supply support and depot repair model is now being replicated for JBC-P, the Army's command and control and situational awareness capability.

MR. DAN J. QUINN is the product support manager for PEO C3T's PM for Mission Command at Aberdeen Proving Ground, Maryland. He has an M.S. and a B.S. in information technology from the University of Maryland University College, and an associate degree in general science from the University of South Carolina. He is Level III certified in life cycle logistics and Level II certified in project management, and is a member of the Army Acquisition Corps (AAC).

MR. ALLEN J. HARDISON is the deputy director for the CECOM Integrated Logistics Support Center's C3T Directorate. He has an M.S. in management from the Florida Insitute of Technology and a B.S. in management from Southern University. He is a member of the AAC, and is Level III certified in life cycle logistics and program management.

CHIEF WARRANT OFFICER 5 ERNEST "JOE" SYLVESTER is the PEO C3T senior adviser for product support and readiness in the Readiness Management Division. He is the first chief warrant officer 5 assigned to PEO C3T through a joint initiative with the Ordnance Corps and the assistant secretary of the Army for acquisition, logistics, and technology to place senior warrant officers with various PEO headquarters.


GLOBAL NETWORK OPERATIONS BEYOND THE INSTALLATION
DOD Network
NIPR & SIPR
I3MP
Connects Army installations
to the larger DOD Network
Local net security
Email and storage
Network operations
Classrooms
Home Station Mission Command Center
Logistics centers
Main installation cantonment area
(Finance offices, personnel offices, etc.)
Motor pools
Simulation center
Training facilities
Traditional voice-
switching operations
Installation Network
(Fiber or Wireless)
I3MP fields and modernizes the
entire network on Army installations
(network paths and switching).
I3MP delivers data and voice to buildings, not within the building.

FACES *of the* FORCE

PRODUCT MANAGER INSTALLATION INFORMATION INFRASTRUCTURE MODERNIZATION PROGRAM

Enabling information dominance: PM I3MP's team of leaders ensures comms readiness

by Mr. Scott Sundsvold

In an Army for which readiness is the top priority, Soldiers need a network that provides a secure, integrated, standards-based environment that ensures uninterrupted global access and enables collaboration and decisive action throughout all operational phases and across all environments. The Product Manager for Installation Information Infrastructure Modernization Program (PM I3MP) is helping to make this vision a reality.

Comprising 104 civilians, military personnel and contractors, PM I3MP enables information dominance by rapidly delivering innovative and cost-effective information technology solutions to connect the global Army.

"Providing programmatic oversight to the procurement and installation of the Army's information infrastructure is challenging and dynamic work," said Brendan Burke, PM I3MP. "We work in a complex environment, and to meet this challenge, we nurture holistic awareness, giving everyone—Soldiers, civilians and contractors—a stake in the fight. When we empower our people, we thrive."

To keep pace with the maturation of technology and the technological challenges of sustaining a global information infrastructure, the Army needs leaders who can outthink and outsmart ill-structured, "wicked" problems.

MAJ. ALEYZER MORA

TITLE: APM for command centers, I3MP, Program Executive Office for Enterprise Information Systems

YEARS OF SERVICE IN WORKFORCE: 4

YEARS OF MILITARY SERVICE: 20

DAWIA CERTIFICATIONS: Level III in program management

EDUCATION: M.S. in acquisition and contracting, Florida Institute of Technology; MBA, Touro University; B.S. in business administration, Methodist University

AWARDS: Bronze Star Medal, Defense Meritorious Service Medal, Meritorious Service Medal (1 oak leaf cluster (OLC)), Army Commendation Medal (4 OLCs), Army Achievement Medal (4 OLCs), Joint Meritorious Unit Award, Army Good Conduct Medal, National Defense Service Medal (1 star), Iraq Campaign Medal, Global War on Terrorism Service Medal, Korea Defense Service Medal and Humanitarian Service Medal

WHAT DO YOU DO, AND WHY IS IT IMPORTANT TO THE ARMY OR THE WARFIGHTER?
Our organization provides upgrades to Army and Army-supported combatant command centers that include voice, data and video teleconference systems for unclassified and multiple classified networks. Our organization enables commanders to execute uninterrupted expeditionary mission command through all phases of the operation as part of the mission command network vision. We also enable Army divisions, corps and theater headquarters to deploy and distribute warfighting functions and watch sections across the mission command nodes according to the commander's intent.

WHAT ADVICE WOULD YOU GIVE TO SOMEONE WHO ASPIRES TO A CAREER LIKE YOURS?
Concentrate on getting education early, and transition to the Acquisition Corps as early as possible to acquire the experience to perform at higher levels. Start networking with other acquisition professionals. Complete pertinent Defense Acquisition University courses and stay connected. This is a field that requires a lot of exposure. Learning the intricacies of the profession can be challenging if senior military members and Army civilians do not share their "secret sauce." The acquisition workforce needs the contracting education to establish the right vehicles that complement this complex process and serve the taxpayers in the best way possible.

"We're working hard to align the resources that we have today to ensure that the force of tomorrow has the required systems to fight our nation's future wars."

For example, how can the Army keep its global force connected? Or how can the Army network be as mobile as our Soldiers? I3MP addresses these challenges through professionalism, dedication to the mission and putting the right people and resources in place to procure, install and sustain the information infrastructure. It has three assistant managers helping to lead that work, providing information technology (IT), infrastructure modernization and life cycle management of the Army's stateside Installation Campus Area Networks and strategic command centers.

"At the commander level, the operational need is real. You can see quickly how these systems provide the commander critical decision-making information and how that commander is effectively using it in making command decisions," said Alberto Dominguez, assistant product manager (APM) for IT capability modernization efforts within the continental United States (CONUS).

Dominguez's team provides Army bases, posts and stations with foundational installation capability sets, including data network modernization, outside plant modernization and voice network modernization. These projects enable the implementation of network modification and Home Station Mission Command Center (HSMCC) capabilities, which are managed by Maj. Aleyzer Mora and Kevin Chinn.

With decades of experience in the Army acquisition community, Dominguez has delivered IT capability modernization projects at multiple military installations across the world. These projects created robust and scalable network information infrastructure improvements that provided base services and support in a broad spectrum of training, operational and Soldier sustainment needs. For example, Dominguez's team in 2015 had oversight of the IT modernization efforts at Fort Gordon, Georgia, worth approximately $17 million. IT modernization included robust outside-plant fiber and Voice over internet Protocol (VoIP) capabilities supporting 7,000 voice users and providing network modernization capabilities to 23,000 users.

Together, he and his team lead Army efforts for accomplishing outside-plant infrastructure installation of copper and fiber-optic cable and gigabit ethernet data network modernization worldwide. This work involves outside-plant copper and fiber infrastructure modernization that allows Army posts to expand network bandwidth and access capacity. The designing and planning involved in these efforts are no different than planning the development of a small city to support bandwidth growth within the next five to 10 years.

WRAPPING UP

Dominguez, standing, rear right, conducts a briefing on modernization efforts at Fort Stewart, Georgia, in November 2015. Dominguez and his staff are projected to complete modernization efforts at eight sites this year. (U.S. Army photo)

By supporting the Army's telecommunications infrastructure, data networks and voice-switching modernization efforts, Dominguez and his team enhance the delivery of IT services to Army customers. The work is highly technical and can include unforeseen technical risks involving environmental and historical site conditions. For example, providing a needed VoIP capability requires Dominguez's team to work with multiple experts from the information technology, information assurance and commercial market communities.

"Our work is highly technical, the tasks are challenging and our responsibilities are great, but the mission is clear: Soldiers first," said Dominguez. He takes tremendous satisfaction in his role as a project manager when he can directly support the Soldier. "This job gives you a different compass and set of values, where everything you do has a set purpose, a timeline and a sense of urgency in meeting the operational needs and system-critical performance objectives."

MISSION COMMAND FROM HOME STATION

Mora is the APM for HSMCC. An Army chief information officer/G-6 initiative, HSMCC is the Army's evolutionary approach to providing corps, divisions and select other commands the capability to host and operate mission command systems at home station. Once it's fully functional, the HSMCC

KEVIN CHINN

TITLE: APM for network modernization – CONUS

YEARS OF SERVICE IN WORKFORCE: 6, following 19 as a contractor

DAWIA CERTIFICATIONS: Level III in information technology

EDUCATION: B.S. in finance, Virginia Tech; associate degree in business administration, Northern Virginia Community College

WHAT DO YOU SEE AS THE MOST IMPORTANT POINTS IN YOUR CAREER WITH THE ARMY ACQUISITION WORKFORCE, AND WHY?
Experiencing the "doing" part of fielding hardware and software products across the Army enterprise gives me an appreciation for the hard work and dedication to mission by our Soldiers and civilians to get the job done. I always try to keep those experiences in mind as an assistant product manager so that the decisions we make as a team take into account the perspective of the customer.

WHAT'S THE GREATEST SATISFACTION YOU HAVE IN BEING PART OF THE ARMY ACQUISITION WORKFORCE?
Providing Soldiers and civilians with a new or improved capability that enables them to complete their assigned missions with greater effectiveness and efficiency. When you help someone or an organization solve a problem with a new technology or business process, you see that "aha" moment on their face. It is extremely gratifying to see them think about the possibilities of applying that new technology to improve their job or organization, and expanding the technology across an enterprise.

ALBERTO DOMINGUEZ

TITLE: APM, CONUS, and contracting officer's representative

YEARS OF SERVICE IN WORKFORCE: 30

YEARS OF MILITARY SERVICE: 3 1/2

DAWIA CERTIFICATIONS: Level III in program management and engineering; Level II in information technology

EDUCATION: B.S. in electronic engineering, University of Puerto Rico; graduate of the Defense Language Institute

AWARDS: Army Meritorious Service Medal, Army Service Ribbon

HOW DID YOU BECOME PART OF THE ACQUISITION WORKFORCE, AND WHY?
Early in 1983, I joined the Army as a research and development engineer and had the opportunity to contract out research with major universities such as the University of Arizona, the National Institute of Standards and Technology in Boulder, Colorado, and the Massachusetts Institute of Technology. The Army gave me the opportunity to mentor Hispanic high school students to become engineers or to continue education in a technical career. In 1987, I became the Army's lead project officer for the fielding and integration of multiple personnel and financial systems over the Defense Data Network. I fell in love with project management—being a leader, and taking the lead in getting the fielding of the systems done.

CAN YOU NAME A PARTICULAR MENTOR OR MENTORS WHO HELPED YOU IN YOUR CAREER? HAVE YOU BEEN A MENTOR?
To name a few, Lt. Gen. Emmett Paige Jr. (USA, Ret.), Nino Giordano, Col. John Barnes (USA, Ret.), Col. Skip Dekanter (USA, Ret.) and Col. Robert Mikesh. All are great leaders with different management styles but are "outside" thinkers, value everyone's ideas and allow you to assume certain measureable risks to accomplish the mission. Our work is about the mission and placing Soldiers' needs first.

I have been a mentor for Hispanic engineers, and I volunteer in the Special Olympics. I get great satisfaction from being a mentor and challenging everyone to compete and do their best.

will provide a suite of standardized capabilities to support expeditionary mission command during all operational phases.

Mora is directly involved in program oversight of the technical refresh of the audiovisual and data network infrastructure and equipment at select operations centers. The first four sites for 2016 are the operations centers for the 4th Infantry Division at Fort Carson, Colorado, 25th Infantry Division at Schofield Barracks, Hawaii, 1st Infantry Division at Fort Riley, Kansas, and 3rd Infantry Division at Fort Stewart, Georgia.

PM I3MP is responsible for the overall project management, system design, procurement, technical oversight, information assurance assessment, system integration and testing, and system transition of the HSMCC hardware technical refresh phase. "We're working hard to align the resources that we have today to ensure that the force of tomorrow has the required systems to fight our nation's future wars," said Mora.

He is quick to recognize the mentors who have helped him in his career. "They have been able to show me the ropes of how to engage with functionals, vendors, combat developers, materiel developers, testing experts, logisticians and all the stakeholders. … I hope that one day I'm able to influence the acquisition workforce the same way that only they know how to do it: through positive leadership."

NETWORK MODERNIZATIONS

Chinn is APM of network modernization – CONUS, or NETMOD-C. He assists the I3MP product manager with upgrading all stateside Army IT infrastructure, with the goal of improving the Army's command and control through unified voice, video and data capabilities.

NETMOD-C standardizes U.S. Army installation network architectures and collapses more than 30 separate networks into a single Army system, enhancing network security. As a result, Chinn and his team work with Army installations to establish a single end-to-end system, modernized from home station to the Soldier's tactical edge.

In the process, NETMOD-C is helping the Army move from speeds of 1 gigabyte per second (Gbps) to speeds of 10 Gbps and consolidate multiple smaller, local area networks into larger regionalized networks. The net effect is standardized network operation and management that enables Soldiers to deploy anywhere and still maintain connectivity. The extra bonus in these modernization efforts is the additional cost savings. By combining multiple networks into one network and passing more data through less cable, the Army reduces the cost of installing and sustaining the network.

For example, Chinn's team started this massive information infrastructure hardware upgrade in 2014, affecting nearly 1 million end users at 79 major military installations worldwide. NETMOD-C continues this work in 2017, conducting network modernizations at 20 additional sites in CONUS. As a result of NETMOD-C, Chinn said, "Network bandwidth should no longer be an issue when a Soldier needs a new capability."

Sites will receive upgraded core and Defense Information Systems Agency routers, capable of supporting speeds up to 10 Gbps. These modernization efforts will continue until 2019, when the final group of sites receives the upgrades. Chinn and his team will start the rotation process all over again in 2020, doing modernizations at the sites they completed in 2014.

Despite budgetary difficulties over the past several years, network modernization has remained a high priority for the Army. And even with the rising cost of technology and continuing budget shortfalls, Chinn and his team remain dedicated to accomplishing the mission. "Achieving the goals set out each year is a challenge that requires innovative products, solutions and services, achievable only by a team working collaboratively across the enterprise," he said.

CONCLUSION

PM I3MP continues to rapidly deliver innovative and cost-effective IT solutions to connect the global Army. Dominguez and his staff are projected to complete modernization efforts at eight sites. Mora and his team are planning to complete the HSMCC technical refreshes at the first four sites and initiate planning for several more operations centers within the United States, while NETMOD-C will continue to enable global collaboration by ensuring that bandwith will no longer be an issue. The net effect is the diligent pursuit of information dominance for every Soldier.

MR. SCOTT SUNDSVOLD is a strategic communications analyst for Engility Corp., providing contract support to PM I3MP. He holds an M.S. in international relations from Troy University and a B.A. in the critical study of cinema and television from the University of Southern California. A U.S. Army veteran, he has 10 years of communications experience working with the U.S. military.

EQUIPPED TO CARE

1st Lt. Chuck Venable, a resident in the 10th Combat Support Hospital (CSH), and Sgt. Ravalene Butler, an aviation medical noncommissioned officer of the 140th Aviation Regiment, 40th Combat Aviation Brigade (CAB), treat a simulated patient at a tactical combat casualty care lane at Camp Buehring, Kuwait, in February 2016. CSHs can treat any patient in theater and handle everything from dispensing prescriptions to performing oral surgery. (U.S. Army photo by Staff Sgt. Ian M. Kummer, 40th CAB Public Affairs)

Lifesaving *Life Cycle* Management

Central management of medical materiel keeps four fully stocked combat support hospitals at the ready.

by Maj. Nikki L. Davis

More than a dozen years of combat have offered many lessons learned for Army medicine. As a medical materiel life cycle manager, the U.S. Army Medical Materiel Agency (USAMMA) has learned that every equipping decision has to be both affordable—including life cycle logistics costs—and cost-effective in addressing the known capability gaps. Over-procurement of medical materiel to close a specific gap may hamper our ability to close other gaps and support today's expeditionary Army.

One way we achieve greater and sustainable medical readiness is through centralized management of high-value, high-volume materiel. An example of this centralized management is the Medical Materiel Readiness Program (MMRP), which began in 2007 under the authority of the Office of the Surgeon General.

MMRP consists of four complete 248-bed combat support hospitals (CSHs) that comprise complex equipment that requires annual maintenance on a rotational basis and must be continually updated by USAMMA personnel at Sierra Army Depot, California. USAMMA biomedical maintenance engineers perform technical inspections and calibration on biomedical maintenance-significant equipment for one CSH per quarter. USAMMA funds Sierra Army Depot to perform care of supplies in storage and repairs on the nonmedical associated support items. The ability to request specific elements or an entire CSH allows the four MMRP CSHs to offset the requirement for the U.S. Army Reserve Command to maintain 16, 248-bed CSHs, and supports the U.S. Army Forces Command's seven 164-bed companies.

UNPRECEDENTED LIFESAVING

To fully understand the MMRP, envision a CSH, which is the Army's most complex medical unit. Each CSH contains thousands of medical equipment items that are packaged and transported in hundreds of military-owned cargo containers.

CSHs have provided unmatched Role 3 combat health support with a 98 percent survivability rate—the highest in the history of American warfare. The CSH provides hospitalization and outpatient services for all categories of patients within theater. It has four wards providing intensive nursing care for up to 48 patients and 10 wards providing intermediate nursing care for up to 200 patients. The CSH offers pharmacy, psychiatry, public health nursing, physical therapy,

clinical laboratory, blood banking, radiology, nutrition care services, emergency treatment receiving, triage and preparing incoming patients for surgery. Within the hospital, surgical capabilities include general, orthopedic, thoracic, urological, gynecological, and oral and maxillofacial—based on six operating room tables staffed for 96 operating table hours per day. Consultation services for inpatients and outpatients include area support for units without organic medical services.

Role 3 capabilities include resuscitation, initial wound surgery, postoperative care and more advanced ancillary services. To maintain their success rate, CSHs need significant maintenance support as well as regular modernization to keep them updated and fully operational. Additionally, many pieces of lifesaving medical equipment, such as CT scanners, are expensive and technically sophisticated, requiring specialized equipment care and calibrations performed by certified maintainers. By centrally managing four CSHs through the MMRP, USAMMA is able to ensure that medical materiel requiring a significant level of regular maintenance is fully operational at all times and capable of being deployed to support active and reserve units based on the needs of the mission.

Though the MMRP was first developed as part of the Army Medical Department investment strategy to support the Army force-generation model, the program now supports the sustained readiness model, underscoring the need for all Army units to be ready to deploy at all times. As mission demands grow and resources shrink, it is imperative that these four CSHs are sustained at the highest state of readiness. Anything less is not an option.

Since its development, MMRP has been called on by the Army several times. In

FULL SPECTRUM OF CARE

A nurse from the 212th CSH attends to a simulated victim at a mass casualty (MASCAL) event in June 2016 during Exercise Anakonda 2016, a Polish-led multinational exercise of about 31,000 participants and a premier training event for U.S. Army Europe. CSHs can offer intensive nursing care for up to 48 patients and intermediate care for up to 200. (Photo by Sgt. 1st Class John Fries, 326th Mobile Public Affairs Detachment)

CSH SUPPORTS CASUALTY EXERCISES

Lt. Col. Anita Lesure, a Soldier with the 801st CSH and head nurse of the operating room, examines a patient's chart to decide further treatment during a MASCAL exercise simulating a helicopter crash with 32 casualties at Fort Hunter Liggett, California, in May 2016. Medics gave battlefield aid and evacuated the casualties to the CSH. (U.S. Army photo by Sgt. Kimberly Browne, 350th Public Affairs Detachment)

MEDICINE IN THE FIELD

The 21st CSH at Fort Knox, Kentucky, provided medical care to 15,000 personnel at the 2016 Cadet Summer Training, during which Army ROTC cadets spent two months preparing to become second lieutenants. A CSH contains advanced biomedical equipment that degrades if not used and maintained regularly, so the Sierra Army Depot, through MMRP, performs technical inspections and calibrations each quarter. (U.S. Army photo)

SAVING MONEY TO SAVE LIVES

21st CSH Soldiers provide medical care during a summer 2016 exercise at Fort Knox. Keeping the many moving parts of a 248-bed hospital up to date and ready to be dispatched to the field at a moment's notice is a complicated and expensive undertaking. MMRP centrally manages four complete CSHs, thereby spreading out the costs of upgrading and maintenance. (U.S. Army photo)

2009, USAMMA deployed medical assets from MMRP in support of 31st CSH deployment to Operation Enduring Freedom. During that period, MMRP provided more than 60 pieces of medical equipment valued at over $4 million to support the 31st CSH. The most recent use of MMRP was in July 2016, when USAMMA issued three dental medical equipment sets to the 28th CSH, making advanced dental care available to both U.S. and allied forces.

The goal of MMRP is to deliver efficient and sustainable medical readiness. The MMRP ensures that four centrally managed CSHs are maintained at a maximum state of readiness for their entire life cycle—from when they are assembled throughout their usage until they are modernized or divested. To reduce costs where possible, the MMRP focuses on efficiently managing maintenance, inventory, spare parts and storage. When compared with the costs of having to field and sustain all previous active companies and reserve CSHs, MMRP reaps an annual cost savings for the Army of $12.3 million in reduced care of supplies in storage and approximately $500,000 in sustainment costs.

CONCLUSION

Central management of medical materiel makes sense—both in terms of cost control and sustainable readiness. MMRP is a solution that provides greater value to today's Army, for which resources are limited and readiness is not an option but rather the No. 1 priority.

For more information or questions and details about the MMRP, contact USAMMA Centrally Managed Programs at 301-619-4462. Or, see USAMMA Supply Bulletin (SB) 8-75-S7, Chapter 6 and Appendix C – Template for Request for Release of MMRP.

MAJ. NIKKI L. DAVIS is chief of centralized contingency programs at USAMMA, Fort Detrick, Maryland. She holds an M.A. in human services from Liberty University and a B.S. in social work from East Carolina University. She was commissioned a distinguished military graduate through the Reserve Officers' Training Corps in December 2002 as a Medical Service Corps officer. Her military education includes the Army Medical Department Officer Basic Course; the Medical Logistics Management Course; the Army Medical Service Captains Career Course; and the U.S. Army Command and General Staff College. She is Level II certified in program management.

MR. JAMES "JAY" CLARK

COMMAND/ORGANIZATION:
Architectural Branch, Civil Structures Division, Engineering Directorate, U.S. Army Engineering and Support Center, Huntsville, Alabama

TITLE: Architect

YEARS OF SERVICE IN WORKFORCE: 32

DAWIA CERTIFICATIONS:
Level II in facilities engineering

EDUCATION:
Master of architecture and bachelor of architecture, Oklahoma State University; registered architect

AWARDS:
Commander's Award for Civilian Service; Employee of the Year (2), U.S. Army Engineering and Support Center; U.S. Army Corps of Engineers Architect of the Year

Excellence by design

What began as a summer job with the U.S. Army Corps of Engineers (USACE) turned into a career for James "Jay" Clark, thanks to a boss's encouragement and an early assignment that provided a young architect the opportunity to do more than just design restrooms.

Clark started with USACE in 1982 while he was in college. "I only expected to be there for that one summer," he said. "But I received a nice letter of commendation for the work I had done, plus my boss had told me he really wanted me back the next summer, so I reapplied and came back the following year." After a couple of summers, the Army offered Clark a temporary position at a higher level than most young architects. "Also, I had been involved in actual design projects, not just doing toilet details like would have been the case at a large architectural or engineering firm," he said. "Even before I graduated, I was put in charge of a project at Fort Sill, Oklahoma, to develop final working drawings."

Much of Clark's work over the past 30 years has been in standard designs for several types of facilities, including physical fitness facilities, child development centers, school-age centers, youth centers and fire stations. "Developing these standards has led to major improvements in the quality of life for Soldiers and their families across the Army, while at the same time conserving taxpayer dollars," he noted.

He was also involved in establishing centralized procurement of furniture for unaccompanied housing, providing a uniform level of quality and durability across the Army and reducing the amount of money the Army spends on furniture. His work has taken him to physical fitness facilities in Germany, DOD schools in Puerto Rico and planning meetings in Alaska, as well as sites across the United States for a wide variety of projects. He credits his career longevity to that diversity and to the satisfaction of a job well done.

"I think what is most memorable for me now are the facilities that were built in the last 10 years to the standards I developed," Clark said. Around 2000, he was involved in a complete overhaul of the standard design for physical fitness facilities, providing uniform criteria, guidance and conceptual plans similar to those found in college and municipal fitness facilities.

Following the revision, he took part in the design and construction of the Aquatics Training Center at Fort Bliss, Texas, working with the design-build contractor, users and the Little Rock District of the Corps of Engineers. It's not exactly your dad's gym: The center has three different pools—with color-changing LED bulbs for the underwater lighting—as well as a half-court basketball court and a rock climbing feature with waterfalls. "I find it very rewarding to visit those facilities now that they're completed—to hear all of the positive feedback and to hear from the facility managers how popular the new facility has become, mainly due to a number of the features that I incorporated within my standards."

One of the biggest changes he has seen over the past four decades is in technology. "We used to draw on Mylar sheets using plastic lead in our mechanical pencils. Everything was done by hand." Clark was one of the first architects in the Corps to use computer-aided design and drafting (CADD) when the organization introduced it in the mid-1980s, and he used CADD to create the first standard designs. "In fact, to make the drawings look better, I created the drawings on CADD and the [text] on a word-processing type of computer, and stuck the text onto the drawings with clear sheets."

The other noteworthy change Clark has seen is the role of the architect in USACE. "When I started back in the Tulsa [Oklahoma] District in 1982, they had just created the architectural section, and we only had one or two licensed architects. The role of the architect within USACE at that time was also not well-known or defined. Over the years, the value of the architect to a product team has become much more apparent and accepted."

In spring 2016, he applied for a temporary promotion to serve as chief of the newly formed Interior Design Branch in the Civil Structures Division at Huntsville. Over the summer, he applied for the permanent position and got the job. The new role represents a big change, managing nearly 30 interior designers and handling architectural designs, criteria and review, but it is one that Clark takes on without hesitation.

"When I started here, architecture wasn't a common profession within the Corps. Over my years here, I have helped grow the role. Now I feel it's time for me to give back. Interior design has not had a predominant role in the Corps, and I'm really committed to this great group of designers and to changing that culture, like the architects did."

—MS. SUSAN L. FOLLETT

UPON FURTHER REVIEW

Clark reviews architectural drawings at the U.S. Army Engineering and Support Center, Huntsville. (Photo by Debra Valine, U.S. Army Engineering and Support Center Public Affairs)

POLISHING THE SILVER

Rashad Scott, an engineering technician at the Edgewood Chemical Biological Center's (ECBC) Advanced Design and Manufacturing Directorate, uses a direct metal laser sintering machine to remove a platform of stainless steel parts for partners at the U.S. Army Research Laboratory's (ARL) Materials Manufacturing Technology Branch. ARL and ECBC work together to share additive manufacturing knowledge as well as additive manufacturing capabilities for R&D support. (U.S. Army photo by Conrad Johnson, RDECOM)

A *NEW* DIMENSION *Of* ACQUISITION

RDECOM explores new ways of using 3-D printing to meet Soldiers' needs quickly and inexpensively while minimizing the logistics footprint.

by Ms. Argie Sarantinos-Perrin

A Soldier heads back to camp, grabs a power bar and unloads his gear. The power bar, which was "printed" minutes earlier, contains all the nutrients his body currently needs, according to sensors that are embedded in his uniform.

While this sounds like something from a sci-fi movie, engineers and scientists at the U.S. Army Research, Development and Engineering Command (RDECOM) are looking at ways to use additive manufacturing (AM, also known as 3-D printing) to meet Soldiers' needs. Using AM to supply Soldiers with customized nutrient-dense food, repair critical parts on demand or print new cells to repair burned skin will not only lighten the logistics burden but also make the acquisition process more efficient.

"The vision is to be able to have additive manufacturing as a tool in the toolbox so that Soldiers can manufacture and produce a product as close to the point of need as possible," said Andy Davis, program manager for the Army's Manufacturing Technology program (ManTech). Part of RDECOM, which is a major subordinate command of the U.S. Army Materiel Command (AMC), ManTech works closely with Army organizations to identify and fund projects that support the overall Army science and technology strategy.

PRINTING UP THE FUTURE

These parts were made using additive manufacturing, which creates plastic items and other durable components by adding material, layer by layer, using 3-D printers. (U.S. Army photo)

EVOLUTION OF AN IDEA

This breaching tool, which is used to open doors and crates or to cut wires and other material, evolved from the initial pattern on the left to the final product on the far right. Based on Soldier feedback on the original design, the Ex Lab team added contouring to the handle for safety and grip. The team also added quick-change blades and hex holes in the handle so that it can be used as a wrench. (U.S. Army photo)

One type of AM—fused filament fabrication—produces parts from plastic and other durable materials by adding material, layer by layer, using 3-D printers. The material, which resembles heavy fishing line or weed-eater string, is pushed precisely through a print head in the pattern of the item being built.

A key benefit of AM is that it uses only the material necessary to make a part, minimizing waste and saving money. Another important feature is that AM can be used to recycle waste and make new products. For example, RDECOM's U.S. Army Research Laboratory (ARL) is working on a process that takes unwanted material, such as the packaging from Soldiers' Meals, Ready to Eat and water bottles, shreds or melts it and then processes it into a string that is used to make items such as a door handle or a rack. Recycling waste on the battlefield will not only minimize the cleanup process for Soldiers, but also eliminate the wait time for new parts, which can be days or weeks. The amount of time that it takes to print a part using AM depends on the material that is used and the part that is made, but overall it is quicker than waiting for a part to be shipped.

"One of the challenges associated with AM, however, is that it's still new, and our understanding of the process down to the level that lets us repeat it and get the same results over and over again is not there yet," said Davis.

PROVIDING HELP AT THE POINT OF NEED

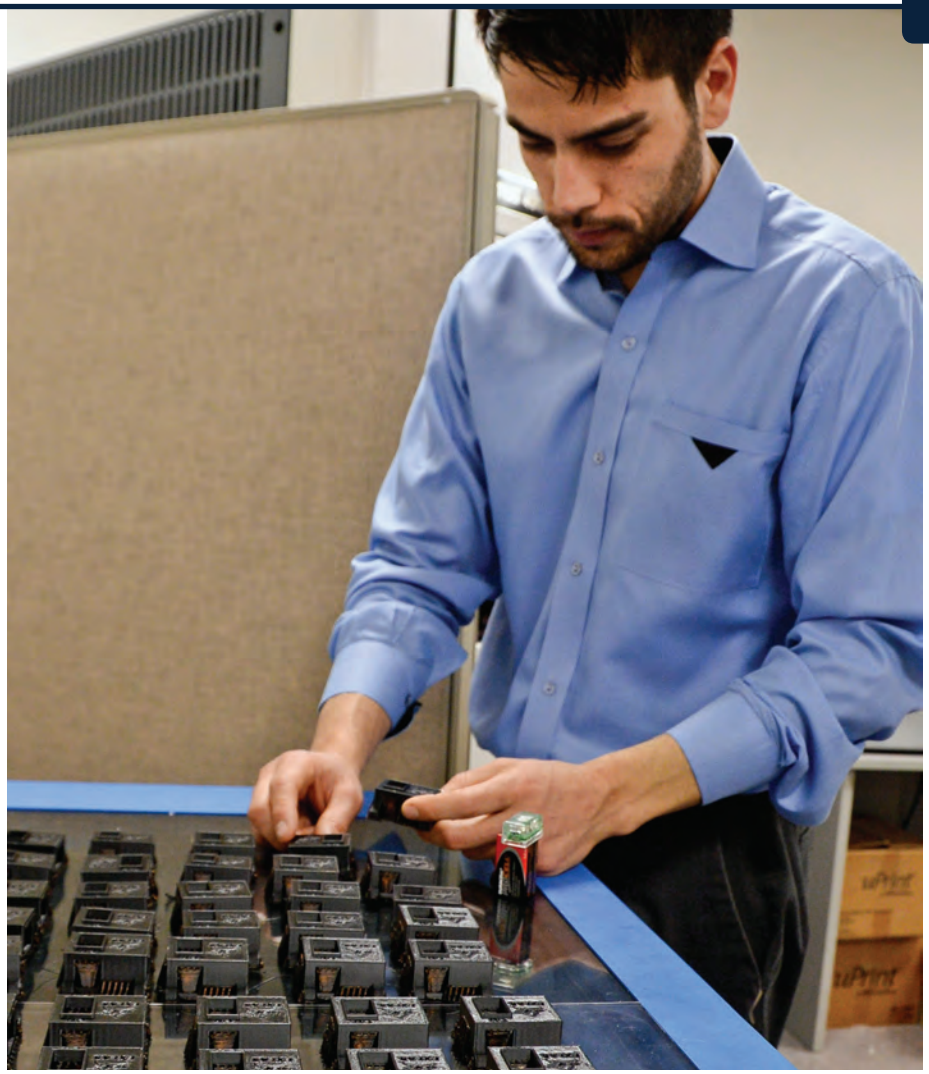
To support forward-deployed Soldiers, RDECOM partners with the Rapid Equipping Force (REF) to help manage, staff and support expeditionary labs (Ex Labs), which can be deployed worldwide. The Ex Labs are designed to get innovative items to the Soldiers as quickly as

possible; one lab is currently at Bagram Airfield in Afghanistan and another lab is at Camp Arifjan, Kuwait.

Each lab is built into a 20-foot shipping container and two ISU-90 containers, customized containers that hold a 3-D printer, supporting equipment and a computer-aided design (CAD) workstation. CAD is used to create virtual working models before they are sent to a 3-D printer. Once a design is perfected, it will be stored in an enterprisewide product data management (ePDM) system that RDECOM and the U.S. Army Materiel Command are creating. Other organizations will have access to the ePDM, fostering data-sharing and eliminating the need to make every design from scratch. The labs are also stocked with traditional tools, equipment and software to design and fabricate metal and plastic parts.

"The labs have an open-door policy so the Soldier can come in and describe his mission capability shortfalls, and the [Ex Lab] team immediately starts brainstorming ideas and solutions," said Angel Cruz, RDECOM Ex Lab project lead. "If the item doesn't work or fit right the first time, then the [Ex Lab] team can revise the design on the spot. AM allows us to produce different iterations of a solution very quickly in order to get it just right."

The on-site Ex Lab team includes an REF noncommissioned officer in charge, an RDECOM lead engineer, a support engineer and a machinist. Together, they develop solutions using textiles, electronics, subtractive manufacturing and additive manufacturing. AM is used for parts that are difficult to machine or as a substitute for parts that would normally be made using injection molding, which is expensive and requires specialized equipment. Other projects require traditional manufacturing or subtractive manufacturing, which takes away material by cutting, grinding, milling and other methods.



MAKING IT BETTER

Angel Cruz, a mechanical engineer who is RDECOM's Ex Lab project lead, displays an Ex Lab project to improve the infrared beacons issued to Soldiers for identification, recovery and site marking. Soldiers approached the Ex Lab to design an adapter for the beacon that included an on-off switch, provided mounting tabs and enabled quick, one-finger operation. The design went through several iterations as a result of the requesting unit's feedback. (U.S. Army photo by Conrad Johnson, RDECOM)

When the Ex Lab cannot complete the work because of a lack of subject matter expertise, required supplies or time to complete the project, RDECOM's Edgewood Chemical Biological Center provides reachback support across the RDECOM network of engineers, scientists and technicians.

RDECOM plans to develop AM in three phases. Phase one will use AM to repair or replace existing parts. Phase two will reduce multipart assemblies from a series of parts to one part. For example, the receiver on a machine gun comprises titanium parts that are welded together in a multipart assembly; the goal is to print all of the parts as one part using AM, thereby reducing the number of parts and cost. Phase three will use AM to create new parts that don't already exist.

PUTTING THE PIECES TOGETHER
Sgt. 1st Class Justin Fulk, Ex Lab noncommissioned officer in charge, welds parts at Bagram Airfield, Afghanistan. Ex Labs are well-stocked with traditional tools, equipment and software to design and fabricate metal and plastic parts. A second lab is located at Camp Arifjan, Kuwait. (U.S. Army photo)

"RDECOM envisions AM's evolution across the Army's acquisition and life cycle management ecosystem," said Davis. "It is a crawl-walk-run approach that simultaneously targets low-hanging fruit such as nonstructural repairs using additive manufacturing and longer-term material development activities such as designing new components using additive manufacturing."

PARTNERING WITH INDUSTRY AND ACADEMIA

In addition to RDECOM engineers and researchers who are developing new and innovative ways to use AM, the Army is partnering with industry and academia to share information and pool resources. The Army has partnered with General Electric Co. (GE), for example, and plans to leverage its experience and knowledge for future Army products.

After years of research, GE has developed a way to produce a metal part for the fuel system on its LEAP engine using AM, which will yield 1 to 2 percent higher fuel economy. The LEAP engine is used on one of GE's commercial airliners, and GE has a dedicated production facility that produces the part. ManTech is also working with GE to mature AM production for parts on the T700 engine, which is owned by GE and used on the Army's Black Hawk and Apache aircraft. GE hopes to draw upon the benefits of AM to create parts that will reduce engine weight and improve efficiency.

"GE will take what it has developed plus what we have incentivized them to develop for Army engines, and then transition that technology and process into the next-generation Army engine, which will be beneficial for many decades," said Davis.

STILL EARLY IN AM

A fundamental challenge for Armywide adoption of AM is the need to have a comprehensive understanding of the specific AM process that will be used to produce a given part as well as the materials that will be processed.

"The vision is to be able to have additive manufacturing as a tool in the toolbox so that Soldiers can manufacture and produce a product as close to the point of need as possible."

Material property and process data are paramount to the qualification and certification process of any part, whether produced by AM or traditional manufacturing. In traditional manufacturing, most processes (e.g., casting) and the properties and tolerances of the materials used (e.g., steel) are universally understood, documented and accepted. However, with AM, new processes and materials are being developed rapidly, and information about the performance of the parts that are produced is often insufficient. ManTech is making investments through several projects to create the capability and infrastructure required to capture, store and share this data across the Army.

"We hand off the data that we have collected after we mature technologies to a certain level," said Davis. "Then we look at the materials and what we want to do with them and find a program office that has potential applications and timelines that we can support."

CONCLUSION

AM is an exciting area of research and one that promises dramatic results in the not-too-distant future. With a sophisticated AM printer nearby, Soldiers deployed in remote outposts around the world will be able to "print" virtually everything they need, from food to shelter to weapons.

If a Soldier gets burned, a 3-D map of his injury will determine what types of cells should be printed and exactly where the cells need to go in order to grow new skin. Before a platoon moves to a new location, Soldiers will recycle any waste, making cleanup quick and easy. Without a cumbersome logistics process, the Army will be able to provide more capabilities at a lower cost. Parts will be printed on the spot, eliminating the shipping process.

While there is much work to do, AM is gathering speed. In time, AM will not only make Soldiers' lives easier, but also change how the Army conducts business.

For more information, go to ***www.army.mil/rdecom****.*

MS. ARGIE SARANTINOS-PERRIN is a public affairs specialist for Camber Corp., providing contract support to RDECOM. She holds an M.S. in professional writing and a B.A. in mass communications from Towson University. She has 11 years of public affairs experience supporting DOD.

A TECHNOLOGY ROAD MAP FOR AM

As the result of rapid growth in AM capabilities over the past several years and the Army's increasing interest and need in using AM to improve readiness, the Army established an AM community of practice (COP) in 2014. The COP, with representatives from across the Army enterprise, meets quarterly to share information, coordinate projects and activities and leverage resources, ultimately avoiding duplicating efforts, improving AM and promoting its use across the Army. COP meetings also serve to identify capability gaps in AM and provide recommendations to Army leadership regarding areas where additional research and development are needed.

The Army recently completed an AM technology road map, which was sponsored and managed by ManTech. The project, which began this year, includes RDECOM, program executive offices, the acquisition community and Soldiers, and provides strategic guidance across the Army materiel and life cycle management communities.

The road map has four key areas that are critical to using AM efficiently and effectively:

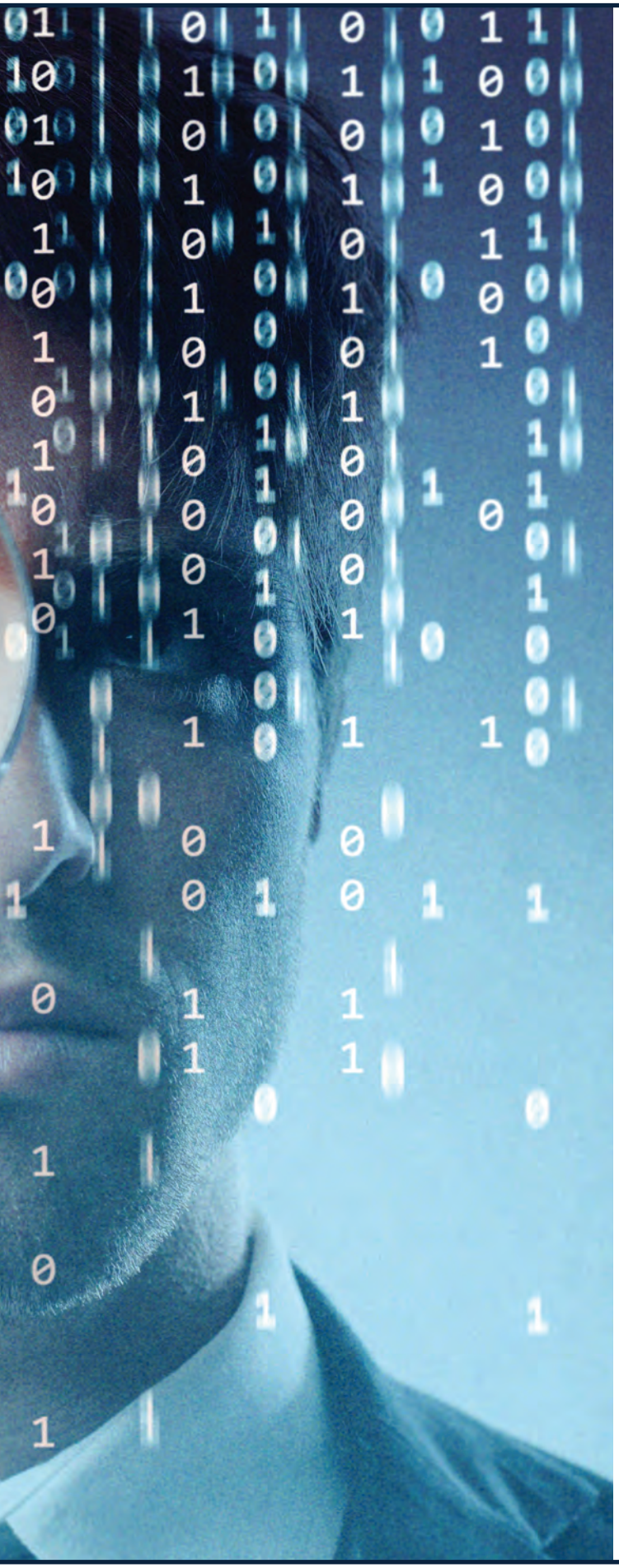
- **Materials:** what needs to be done to develop, mature and capture associated data for materials used in AM.
- **Design:** how to develop and use advancements in the CAD and engineering fields for AM products, and how to best use the capabilities.
- **Process:** what AM processes can be used to make AM parts, and what process capabilities are needed.
- **Value chain:** the most efficient and cost-effective way to use AM and the infrastructure required to support it.

The AM technology road map will be used to inform industry and academia on how the Army plans to use AM, as well as issues that need to be addressed. The Army's road map, along with individual AM road maps from the Navy, the Air Force, the Defense Logistics Agency and the U.S. Special Operations Command, were integrated into an overarching DOD-wide AM plan that was rolled out in December 2016.

"I don't know of any other time when organizations across the Army and DOD came together to develop a road map that involves everyone from the requirements community to the user community and all the way to the sustainment community," said Andy Davis, ManTech program manager.

—MS. ARGIE SARANTINOS-PERRIN

MAGNIFYING OPEN SOURCE ADVANTAGES



ARL releases its first open source software and explores the options, benefits and challenges of making similar releases in the future.

by Mr. Joshua Edwards

Army computer science innovators have started peeling away the barriers to publicly releasing software from the military to the open source community. This means that users around the world will have the ability to see and modify the actual code of those government projects to suit their needs, and potentially pass those changes back to the Army if they prove useful.

The U.S. Army Research Laboratory (ARL) made its first open source release nearly two years ago—Dshell, a network forensics analysis framework for security analysts to easily read and process network activity following an attack. The Dshell team faced extensive requirements related to liability, intellectual property and operational security before its tool was posted to an online repository.

The challenge of publicly releasing computer code is not a new one, and not just for ARL, but across the federal government, as more agencies look into the best way to release open source software. The approval process and other requirements that the Dshell team endured have gradually formalized into the ARL Software Release Process for Unrestricted Public Release, announced in November 2016, just three months after U.S. Chief Information Officer (CIO) Tony Scott and the White House called for a greater release of custom code created by federal agencies in federal source code policy memorandum M-16-21.

PILOT RELEASE

Before it was publicly released, Dshell had a small, informal community of users in several other government organizations. Analysts, inside ARL or out, could use the tool and customize it to find and parse the exact information they needed from network data, such as

MORE EYES, MORE UPDATES, STRONGER SOFTWARE
Sharing network security software on open source forums yields dual benefits: Other security teams get a tool to keep their networks secure, and the overall quality of the product is improved as others download, debug and upgrade it. (Image by U.S. Army Acquisition Support Center)

domain name lookups, reassembled website requests or decoded malware traffic.

According to Tracy Braun, a computer scientist in the Network Security Branch of ARL and the team lead for the Dshell project, the ability to customize the tool and quickly share the changes within its small community made it a good candidate for open sourcing to the wider scientific community.

ARL released Dshell to GitHub, one of many websites that hosts repositories for open source content, for two primary reasons. First, Dshell is a useful tool for keeping networks safe. By sharing it with the world, more security teams gain another specialized tool to keep their networks secure. It improves ARL local security by improving the security of the Internet as a whole. The second is common to all open source software: to improve the quality of the tool by increasing the number of skilled eyes looking for bugs and potential improvements throughout the code.

GitHub was chosen for Dshell also because it allows members to easily download software code and store edits they make, and provides a mechanism to offer feedback to the original software authors.

The Dshell team is aware of the risks of putting security-related government code into the wild. However, the benefits, in many cases, outweigh the risks. The Dshell team decided that providing the means for good actors to review the code and identify any weaknesses exploitable by bad actors is of greater value than attempting to keep it secure through obscurity.

Users can create copies of Dshell and do what they want with it. ARL, in this case, or the host organization of any open source release, has no control over the copies. This is a lot like sending someone a favorite recipe. You cannot stand over his or her shoulder to make sure the recipe is followed to your exact specifications. However, if savvy cooks make improvements to the recipe, they can be passed to you the next time you meet, making your version of the recipe better. The same is true with open source. If others in the community make improvements to the code, they can easily share them with the development team to incorporate into the official version. And that is just what happened.

As of June 2016, users have created more than 11,000 copies of the Dshell tool and have offered 62 suggested modifications. The shared modifications, formally named "pull requests," do exactly what was hoped. Community members found and fixed bugs that the Dshell team missed, and even added new features that improve ARL's ability to detect malicious actors. Additionally, rolling the enhancements into the official version makes it easier to share the software across organizations. Instead of emailing files or sending CDs, collaborators can be pointed to the GitHub page to download the latest updates.

OPEN SOURCE EXPANSION

Some agencies, like NASA, adopted open source early. In 2014, NASA released more than 1,000 of its projects in one mass distribution. Others—like the National Security Agency, the National Guard and the Air Force Research Laboratory—joined more recently.

The most all-inclusive DOD guidance for open source software came from the DOD CIO in 2009. The memorandum addressed a popular misconception that open source software is forbidden by the DOD Information Assurance Policy.

Cem Karan, a computer engineer at ARL working to develop ARL's formal open source process, described the more realistic hurdles for releasing Dshell and other ARL projects. "As an individual, open sourcing software means simply adding a user name and an email address, and then uploading or downloading software as I wish. Conversely, if I publish on behalf of ARL, I

have a lot more to consider," he said. That, he continued, includes "legal concerns with issues like trademark, copyright and patent law. For instance, open source code is generally released under a standard license that relies on copyright as an enforcement mechanism, but federal government works do not have copyright protection."

The problem is that such licenses govern limits of liability and warranty, as well as how intellectual property can be used and shared. Without a license (or with a license that was declared invalid), releasing software may open the door to significant litigation against the government, and against anyone that uses or contributes to government open source projects, Karan said.

"The White House has published a very high-level policy," Karan said. "It will be up to individual agencies how to implement it."

Open source DOD projects remain few. Though military organizations differ, there are three major reasons why more projects have not yet been released as open source—visibility, operational security and paperwork.

Releasing software to the world means just that: The world can see it. There is a certain amount of fear, even within the Dshell team, that releasing software could decrease its effectiveness because others will know how it works and how to avoid it. The risk has to be weighed against the benefits.

Open source is also not necessarily always a good fit for Army projects. Obviously, anything classified is precluded. Even something unclassified may not be releasable if it ties back to close-hold methodologies.

Publicizing software also comes with certain responsibilities. Once a project is released, a community will form around it, and the community will expect a certain amount of feedback. It will expect answers to questions, responses to concerns and regular updates.

When deciding on software to release, Karan said, "it will take scrutiny of each project as we go forward into a new level of transparency."

The U.S. CIO's push for change makes it easier for organizations like ARL to realize the benefits of open source software with the new policy. Dshell's full-on jump into the ocean of open source projects helped find the path and potential pitfalls in the release process, and that should help future projects more easily achieve a public release. ARL is looking for more ways to open public access that are both meaningful to the Army and beneficial to the software community.

CONCLUSION

Karan has coordinated ARL's open source policy for publication to GitHub in hopes that other agencies would copy, use and change the document in a way that allows ARL to easily incorporate any feedback. The posting also allows other agencies to use ARL's policy as a starting point for their own open source initiatives. "There is no point for everybody building from scratch, which is part of the reason for open source," Karan explained.

In November 2016, U.S. CIO Tony Scott launched the new website Code.gov, which ARL will use alongside other options to share computer code to support basic and applied research. For a research laboratory, releasing projects to the open source community provides an easy way to share the code and methods used in published papers, simplifying external peer review.

Karan described a recent experience with one of his projects. "I have a simulator project that showed amazing results—that is, until I found the bug that was making it so perfect. Once I fixed that bug, it went back to what you would actually expect. If I had published that paper and had the code out there, experts could debate the results and find the glitch. I would have had to retract the paper in that case, but I would have improved the science."

Releasing research projects to the open source community provides wider visibility of computational expertise at the lab. It encourages openness and sharing in a constructive way that can potentially improve projects and processes.

"If we have projects that get traction, that's a big success," Karan added. "More importantly about putting the code out, it helps us to improve the science."

For more information about Dshell or about the ARL software release process for unrestricted public release, go to ***https://github.com/USArmyResearchLab****.*

MR. JOSHUA EDWARDS is a software developer with ICF providing contract support to ARL. He holds a B.S. in information technology with a concentration in database technology and programming from George Mason University. He was instrumental in ARL's Dshell release, and has been working in the cybersecurity realm within the Network Security Branch of ARL for nearly seven years.

PROTECTION FROM ELECTRONIC WARFARE

Enhancing electronic protection of U.S. radio communications is critical for mission success. (Image by the U.S. Army Acquisition Support Center)

REUSE, REFINE, RESOLVE

The Joint Tactical Networking Center shares lessons learned in providing software-defined radio products to enable strategic acquisition.

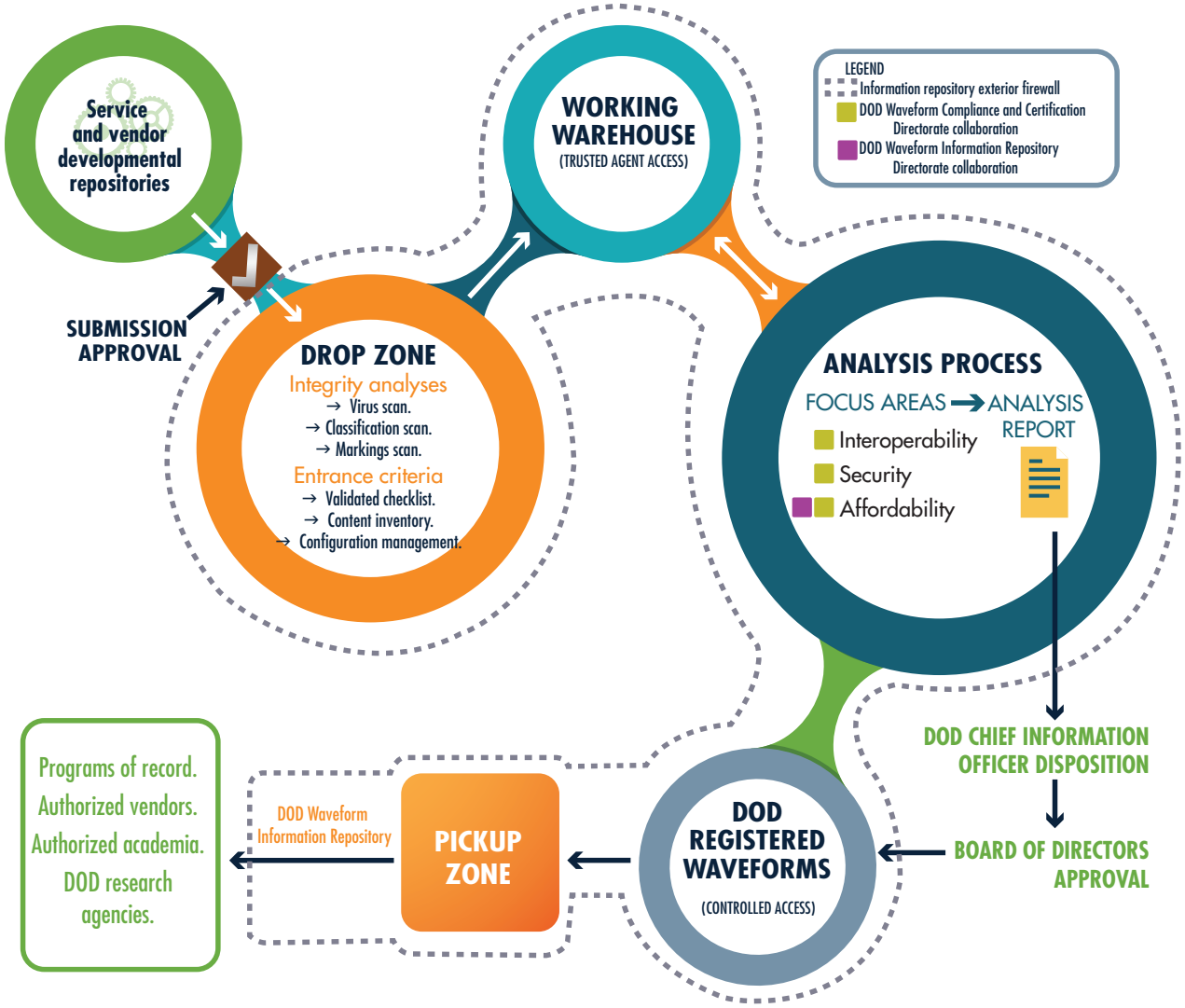
by Lt. Col. Matthew A. "Matt" Jury

It is much easier to define the concepts of strategic acquisition—making it more efficient, more economical and more sensible throughout the life cycle—than to put them into practice for any given program. While the concepts make sense, executing truly strategic acquisition requires process improvements, culture changes, modifications to DOD issuances and reinforcement of strategic guidance, such as that in Better Buying Power (BBP) 3.0.

Since its establishment in 2012 to offer technical expertise on wireless communications, the Joint Tactical Networking Center (JTNC) has assisted program management offices with practical recommendations as they strategically plan software-defined radio (SDR) products. Simply put, today's SDRs are communications devices analogous to smartphones, with common software (waveforms) that allows the devices to wirelessly transmit or receive information.

JTNC's objectives for SDRs are to maximize reuse of waveform software code, refine DOD issuances to keep up with current technology and threats, and implement open-systems approaches. In the process, JTNC has observed certain trends in the acquisition and implementation of tactical waveforms that suggest possible areas for strategic improvement: in electronic protection, early consideration of exportability, open-systems approaches, security gaps, and waveform procurements and deliveries to the government.

FIGURE 1



FROM START TO FINISH

JTNC's core functions are to manage and provide configuration control and technical analyses for its DOD Waveform IR products, providing waveform standards and software communications architecture, and serving as technical adviser to JTNC's board of directors, co-chaired by the USD(AT&L) and the DOD CIO. (SOURCE: JTNC)

ELECTRONIC PROTECTION

BBP 3.0 guidance to achieve "dominant capabilities" requires improvements to SDRs' electronic protection, tailored to current threats. Electronic protection involves actions taken to protect personnel, facilities and equipment from any effects of friendly or enemy use of the electromagnetic spectrum that degrades, neutralizes or destroys friendly combat capability. To accomplish this, we need detailed current threat intelligence and testing that accurately simulates both the main threat and tactical circumstances and tactics. These improvements are necessary to evade interception, jamming and platform destruction, mitigate GPS denial or deception for network fragmentation, and mitigate the effects of friendly and adversarial jamming.

JTNC recommends changes in DOD issuances and procedures for design and testing of tactical radio systems and waveform components to enhance the reliability of communications when subjected to adversaries' electronic warfare systems and tactics.

A recent JTNC white paper, "Electronic Protection (EP) of Tactical Radio Systems," highlights specific electronic protection areas the acquisition community can address strategically. JTNC security analysis of waveforms includes examination of requirements for, and verification of, effective electronic protection against interception, GPS denial or deception, and jamming against electronic warfare capabilities of probable adversaries. Analyses to date consistently indicate that improvements are necessary in intelligence collection targeting, design and testing requirements, test execution, and tactics to enhance electronic protection of radio communications when subjected to our likely adversaries' electronic warfare capabilities.

In the white paper, JTNC recommends quantifying performance thresholds for electronic protection. These quantified electronic protection requirements should be aimed at the threats the intelligence community identifies as most likely to be encountered. These include threats to waveform detection and identification, which allow the adversary to disrupt communication capabilities.

Associated with the development of waveform electronic protection requirements is the development of electronic protection test procedures and representative threat electronic warfare systems to quantify waveforms.

EXPORT CONSIDERATIONS

Integrating exportability considerations at the waveform source code level is more important than ever, given the current nondevelopmental item approach to acquisitions and the continued improvement of existing (and development of new) waveforms for SDR platforms. Developers obtaining waveforms from the DOD Waveform Information Repository on export during a system's design, development and implementation.

CONSIDERING EXPORTS

The JTNC Export Office provides the following practical recommendations in the two areas of requirements and documentation, and training and awareness.

REQUIREMENTS AND DOCUMENTATION

- DOD offices identified as waveform "sponsors" should develop waveform-specific program protection plans that identify any critical program information, critical technologies and known and potential vulnerabilities. Identifying critical information and vulnerabilities ahead of time will make it easier to determine which waveforms and pieces of source code can be exported without risk to U.S. capabilities.

- Identify exportability requirements in the formal requirements process so program management offices have the resources to determine exportability throughout product development. As mentioned in BBP 2.0, program managers (PMs) should increase the incorporation of defense exportability features in initial design. The Joint Capabilities Integration and Development System manual states that exportability should be identified in the capability development document prior to the milestone B decision, and the capability production document prior to the milestone C decision. (See Figure 2, Page 96.)

- Modify DOD issuances, including changing DOD Instruction 5000.02 from "will consider" to "shall address" export.

- Review pertinent program documents to ensure that exportability is better integrated into the overall DOD business case, including the acquisition strategy, acquisition program baseline, technology development strategy, security classification guide, technology assessment and control plan, and data distribution list. Together these documents help enable sound and timely decisions

TRAINING AND AWARENESS

- Update the Defense Acquisition Guidebook based on changes to the formal requirements and acquisition processes to support exportability plans for PMs and acquisition professionals, including the Defense Exportability Features Pilot Program.

- The guidebook should provide example language for typical acquisition activities, such as requests for information and requests for proposals, to help PMs and industry consider future exports in the responses and bids to DOD. This is another way to encourage strategic acquisition planning.

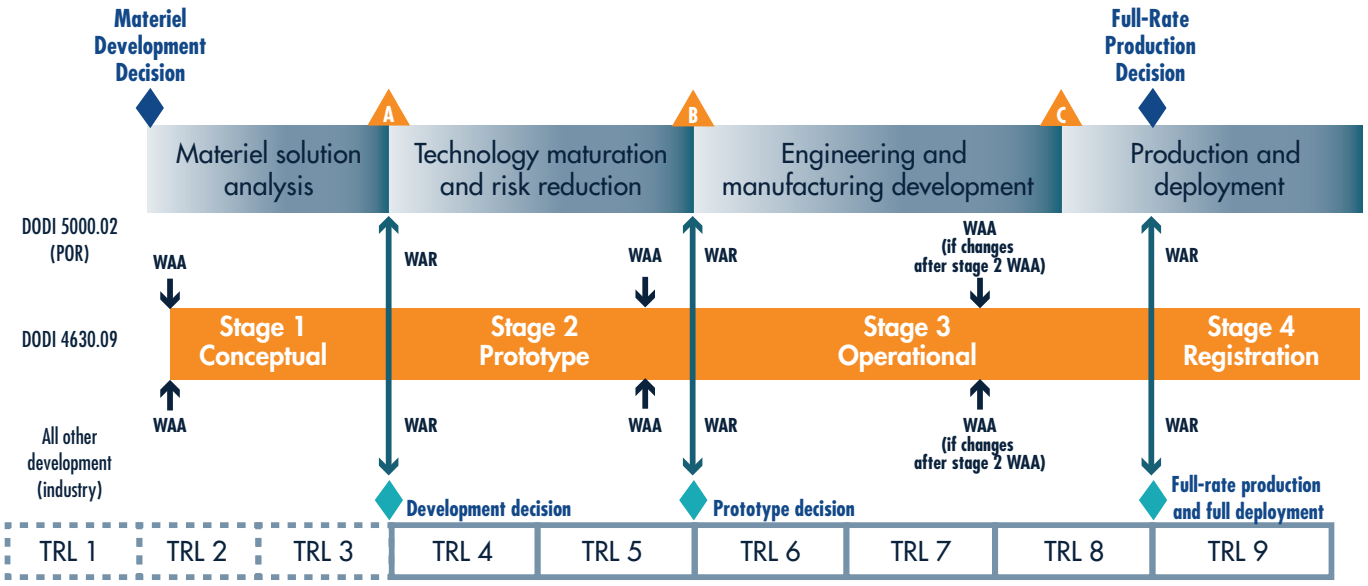
- Emphasize exportability training throughout the Defense Acquisition University's curriculum, in line with BBP 3.0.

- PMs should become familiar with the Defense Exportability Features Pilot Program, which encourages DOD acquisition programs that are nominated by their component acquisition executives and selected by the International Cooperation Directorate of the undersecretary of defense for acquisition, technology and logistics, to assess, design and incorporate defense exportability features in their systems to facilitate foreign sales.

These practical recommendations, along with other changes across the requirements and acquisition processes, could better institutionalize DOD planning for export. This improved planning will help support the DOD industrial base in reducing unit costs and protecting DOD systems, and will provide solutions that interoperate with our foreign partners from the early requirements and into the design phase.

—LT. COL. MATTHEW A. "MATT" JURY

FIGURE 2



STEP-BY-STEP ANALYSIS

The staged waveform analysis approach facilitates the analysis of waveforms throughout the development life cycle and is aligned with DODI 4630.09, Communication Waveform Management and Standardization, dated July 15, 2015. (SOURCE: JTNC)

Key

DODI: DOD Instruction
POR: Program of record
TRL: Technology readiness level
WAA: Waveform analysis application
WAR: Waveform analysis report

(IR) need this exportability guidance early to fully consider acquisition decisions regarding SDR development and potential future sales.

In the past, when the U.S. exported communications equipment to our allies, it was often thought about in the form of a properly secured hardware platform (a radio). As SDRs continue to be developed worldwide, our allies are beginning to request SDR waveform source code to put on their national SDRs.

Accordingly, JTNC technical analysis of DOD Waveform IR products includes exportability. Several JTNC reviews to date indicate the program documentation needs to include consideration of waveform source code export. Unfortunately, in many cases, the documents and artifacts reviewed are vague and do not lend themselves to straightforward observations. To ensure that critical technologies are not inadvertently exported, while enabling allied interoperability by making prudent export decisions, a comprehensive internal analysis of the waveform is needed to develop exportability positions and gain an understanding of any potential vulnerabilities. (See Figure 1, Page 94.)

OPEN SYSTEMS

Implementing open systems approaches requires persistence and effective dissemination of collaboratively generated standards. The culture shift to open systems approaches is challenging, but the benefits of implementing collectively developed and agreed-upon standards include reusability and interoperability. Open systems and architectures are DOD's preferred path to reusability, interoperability and competition, as the April 2015 implementation directive for BBP 3.0 notes: "In accordance with DoDI 5000.02, PMs are responsible for applying open systems approaches in product designs wherever feasible and cost effective. Such approaches should be considered for enabling competition for upgrades, facilitating reuse across the joint force, easing technology insertion, and aiding adoption of incrementally upgraded software."

The JTNC DOD Waveform Standards Directorate is proactively engaging with government and industry entities on the evolution of the software communications architecture and application program interfaces to enable alignment with industry standards and DOD acquisitions. To date, JTNC has 37 tactical radio standards registered in the DOD

Information Technology Standards Registry (DISR). While the DISR hosts many standards, JTNC-developed standards originated in, and apply to, tactical SDRs.

JTNC recently developed an Open Systems Architecture Procurement Requirements Guide for Waveforms and Tactical Radios. The guidance is modeled after language from DOD Instruction (DODI) 5000.02, the BBP 3.0 implementation directive, DOD Open Systems Architecture Contract Guidebook for Program Managers version 1.1, and recently released DOD requests for information and proposals. The intent of the document is to increase DOD and industry adoption of open systems architecture. It is useful to program management offices procuring affordable SDR products and capabilities, providing recommendations for input to solicitations.

The JTNC DOD Waveforms Standards Directorate continues to lead the effort based on proactive implementation of BBP 3.0 through collaboration with the open systems community. In FY16, the directorate engaged with more than 20 PM offices (leaders and technical experts) across the services, eight other government organizations, 14 industry stakeholders, three standards organizations and two allies via working groups, meetings and training events. The collaborative effort and open systems approach enabled the development of Software Communications Architecture (SCA) Specification 4.1, the architecture framework that assists SDR development and meets military and commercial application requirements.

SECURITY GAPS

While SDRs offer substantial improvements in communication capabilities, PM offices should strategically address identified security gaps. The team analyzing waveform security has observed waveform security gaps that require strategic solutions.

The SDR development environment for security was created in 2005 based on National Security Agency Type 1 certification requirements to ensure trusted communication of classified information on radio platforms and pre-evaluation of waveform applications. Since SDRs are indeed software-based, the code is as potentially vulnerable as any other code. But because of the importance of this link in the digital chain, the security of the code is even more important. Cybersecurity threats and defensive techniques have both evolved to a new level of sophistication, increasing the risk of compromise to the current products as a result. Development efforts compliant with SCA 4.1 mitigate security risks based on incorporated architectural measures against more contemporary threats.

Coupled with outdated security controls is recognition that current DOD security reviews are too limited. The DOD information assurance certification and accreditation process and risk management framework (RMF) control application are not focused on software-level requirements. DOD needs to invest in the development of an expanded life cycle approach for waveform software based on the RMF controls.

To maximize the benefit to the government of funded software development, PMs should be specifying, at a minimum, government purpose rights software and appropriate waveform documentation. Over the course of five in-depth analyses, JTNC has developed an experience-derived checklist of waveform artifacts (including source code) that the team uses to make observations in the areas of interoperability, security, affordability and exportability. This list, referred to as entrance criteria for a JTNC waveform analysis, is a resource that PM offices can obtain by contacting JTNC and leverage during waveform procurement to improve the end product.

CONCLUSION

JTNC will continue to execute its mission toward the vision assigned by the undersecretary of defense for acquisition, technology and logistics and the DOD chief information officer for "interoperable, secure, and affordable waveforms and wireless communications in support of service, multiservice and coalition forces." With a uniquely interagency perspective, experience base from waveform analyses and recommended standards from an open systems approach, JTNC will continue to fulfill its role as technical adviser and share observed trends along with associated recommendations.

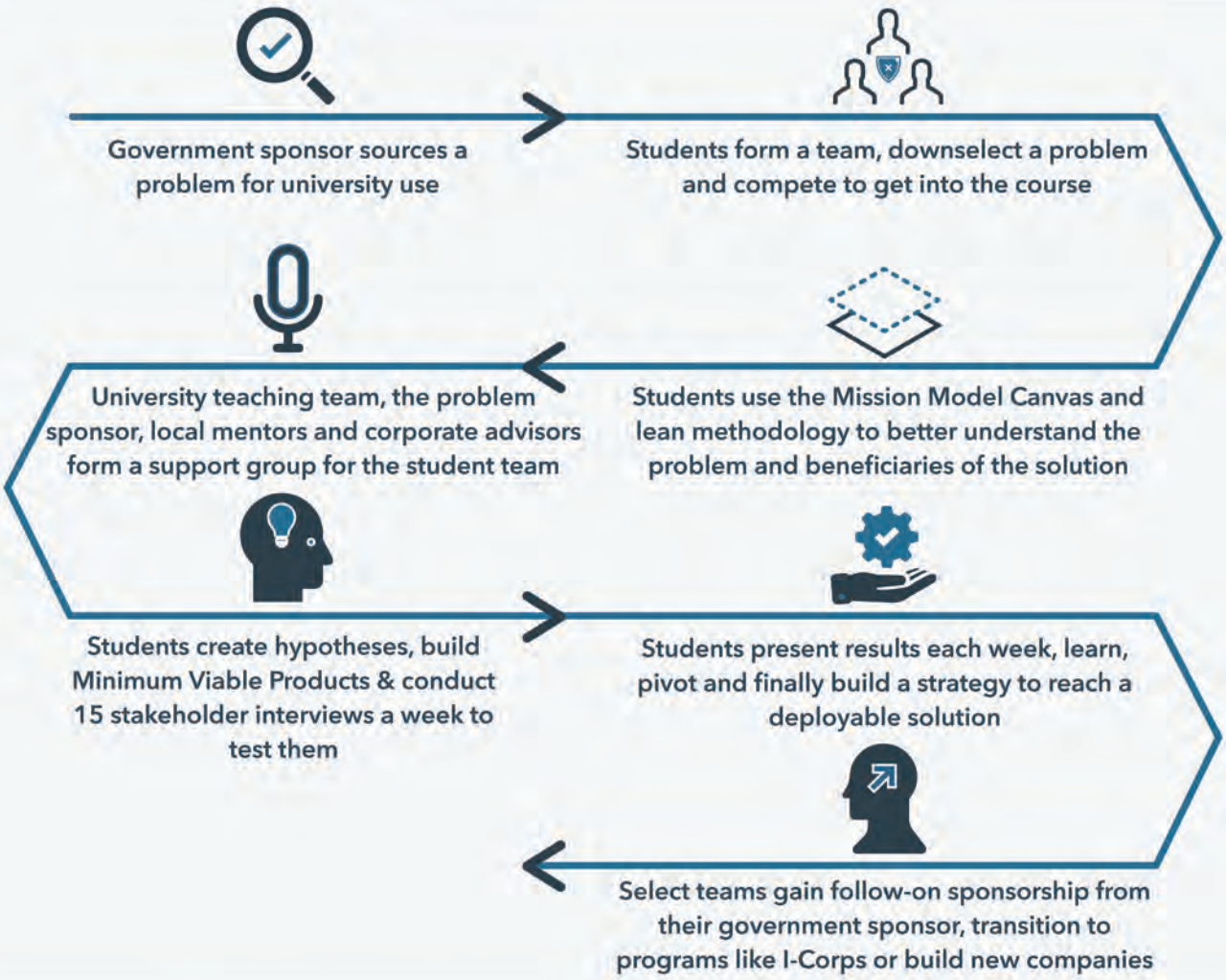
For more information or to request the white paper "Electronic Protection (EP) of Tactical Radio Systems," contact the JTNC Public Affairs Office at ***JTNC.Public.Affairs@navy.mil****. For CAC-enabled access, go to* ***https://www.dodir.mil/jtnc_docs#****.*

LT. COL. MATTHEW A. "MATT" JURY is deputy director of JTNC, San Diego, California, responsible for providing oversight and management in the execution of tactical and strategic plans. He has a master's degree in acquisition management from Florida Institute of Technology and a bachelor's degree in environmental engineering from the U.S. Military Academy at West Point. He is Level III certified in program management and a member of the Army Acquisition Corps.

HACKING FOR DEFENSE™ | H4Di

Overview

Hacking for Defense ™ is a for-credit class that gives students the opportunity to build solutions for real-world problems from the Department of Defense and Intelligence Community that address the nation's emerging threats and security challenges. The class is a student-led format that uses lean methodology with hypothesis and stakeholder validation to build solutions.



Partners & Sponsors

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Learn More

The H4Di community is growing daily. Please contact us at contact@h4di.org or visit h4di.org if you would like to learn more.

HACKING *for* DEFENSE

Started at Stanford and soon to be nationwide, this class turns college students loose on national security problems, and expects results.

by Mr. William Treseder and Mr. Darren Halford

Team AquaLink started off in the wrong direction. The team, part of a class at Stanford University called Hacking for Defense, was working on a problem for U.S. Navy divers, who work for sometimes 12 or more hours at depths of 60 to 200 feet. Currently divers have no way to monitor their core temperature, maximum dive pressure, blood pressure or pulse, which would provide early warnings of hypothermia or decompression sickness (the bends). The goal was to provide a wearable sensor system and apps that would allow divers to monitor their physiological conditions while underwater.

As they began to understand the SEAL divers' workflows and pains, Team AquaLink's members realized that providing health monitoring would just be a Band-Aid on a larger problem: The divers were spending greater periods of time than necessary underwater because of disorientation and inaccurate positioning. Moreover, the divers underwent many time-consuming and risky decompressions in order to surface to check their location. Team AquaLink decided to create a solution that

HOW H4D WORKS

This is the process that students work through in a Hacking for Defense class. After its inaugural course at Stanford, H4D is expanding to approximately 15 campuses in late 2016 and early 2017, and has the potential to grow to approximately 100 campuses. (Graphic courtesy of BMNT Partners LLC)

THE ORIGINAL HACKERS

From left, instructors Peter Newell, Steve Blank and Joe Felter, a former U.S. Army Special Forces colonel and a co-founder of BMNT, observe an H4D class. The three, who together taught the first Hacking for Defense class at Stanford, are writing a book on Hacking for Defense, which publisher John Wiley & Sons is expected to release this fall. (Photos by Rod Searcey, Stanford News Service)

would provide geolocation to the divers while they remained at depth. After interviewing more than 100 SEALs and other underwater experts and designing many minimum viable products (MVPs, a tenet of Hacking for Defense founder and instructor Steve Blank's Lean Startup methodology) to test their hypotheses, the team ultimately built and successfully tested a GPS buoy.

The members of Team AquaLink—Hong En Chew, Rachel Olney, Samir Patel and Army Maj. Dave Ahern, a Downing Scholar at the U.S. Military Academy at West Point's Combating Terrorism Center—were taking the pilot class of Hacking for Defense, a new DOD tool for solving problems.

The class grew out of an encounter in 2015 between a decorated Army colonel and a legendary Silicon Valley entrepreneur. Peter Newell, the managing partner of BMNT Partners LLC—a consultancy that brings together government and Silicon Valley groups to solve complex, critical problems—had retired in 2013 from a 30-year Army career, spending his last three years in uniform as head of the Rapid Equipping Force. (For more on BMNT, see "Speed and Urgency in Silicon Valley," Page 116.) Steve Blank, who retired in 1999 from a 25-year career in Silicon Valley, was teaching his Lean LaunchPad entrepreneurship course at Stanford, and one of his students, a former Army Special Forces Soldier earning his MBA, advised him to meet Newell.

Newell and Blank were scheduled to meet for 30 minutes but ended up talking for more than three hours. Newell was trying to make Soldiers more lethal and safe. Blank was trying to help entrepreneurs build great companies. Each saw the overlaps in the other's approach. Both understood that the secret to innovation is not brainstorming sessions or whiteboards. Instead, innovation results from a disciplined and strategic approach to solving problems. Their joint brainchild is now known as Hacking for Defense (H4D).

H4D—the methodology, and the class that teaches it—is on a mission to accelerate the speed at which national security organizations solve their problems. The core program is a 90-day process in

"As a student, you accept that only your grade reflects the impact of your hard work. H4D breaks that norm because you see your work making a difference for service members."

which the customer works with BMNT to rapidly validate the understanding of a problem, recruit a coalition of users and partners to work on it, build MVPs to test the main aspects of the solution and develop pathways to quickly deploy what works.

The H4D approach has worked on automated orchestration in cybersecurity operations; data visualization for analysts; wearable medical devices; secure near-field networks; advanced manufacturing and rapid prototyping; underwater and airborne drones; and commercial space technologies.

H4D GOES VIRAL

Hacking for Defense rapidly expanded beyond BMNT's work with U.S. government agencies to include the class at Stanford. Since its pilot there in spring 2016, the H4D course has been expanding to universities nationwide in collaboration with MD5, the National Security Technology Accelerator, a partnership among DOD, New York University and other top U.S. research universities to promote civil-military technology cooperation. In addition, other courses are underway and in development to apply H4D methodology to problems associated with diplomacy, space and urban resilience—a collaboration with local, state and federal agencies to solve problems related to emergency response, disaster recovery, domestic relief operations, etc.

In the first step of program expansion, Stanford is currently offering a Hacking for Diplomacy course. (Secretary of State John Kerry paid a visit in October 2016.) Other universities that are holding or will soon offer Hacking for Defense courses include Stanford; Georgetown University; the University of California, San Diego; the University of Pittsburgh; James Madison University and Boise State University.

H4D is not easy work, for either sponsors or students. Sourcing a problem to H4D does not mean organizations get to hand off grunt work to Silicon Valley or academia. Sponsoring organizations are actively involved in the H4D process, whether by sending a team to BMNT or by facilitating interviews and MVP testing with their student teams. That means that organizations interested in solving tough problems through this rigorous process should make sure they are prepared for the workload.

Teams conduct dozens of interviews during H4D, questioning, breaking down and validating their problems. Participants are required to get in touch directly with operators and experts. And sometimes they even spend time wearing the gear and engaging in part of the mission.

AN IMMERSIVE EXPERIENCE

The first H4D at Stanford attracted a diverse group of students that included engineers, law students, MBA students, veterans and military fellows, and even foreign veterans. Students were drawn to the challenge of solving tough real-world problems, and applied their carefully honed technical and management skills in a high-pressure environment that replicated a fast-paced startup company. They were excited to work on problems well outside the academic sphere and relished the opportunity to perform a national service.

"As a student, you accept that only your grade reflects the impact of your hard work. H4D breaks that norm because you see your work making a difference

TAKING A DEEP DIVE

Team AquaLink—from left, Hong En Chew, Rachel Olney, Army Maj. Dave Ahern and Samir Patel—originally set out to develop wearable sensors to warn Navy divers when they were at risk of hypothermia or the bends. But after interviews with SEALs, the team realized hypothermia and the bends were symptoms of the true problem they needed to solve—that divers were underwater longer than necessary because they couldn't pinpoint their location without surfacing periodically.

Both [Newell and Blank] understood that the secret to innovation is not brainstorming sessions or whiteboards. Instead, innovation results from a disciplined and strategic approach to solving problems.

for service members," said Sam Gussman, a member of Team Skynet during Stanford's H4D pilot. The class was a lot of work, Gussman said, "but opportunities like this are why I came [to Stanford]."

Students had to apply to take the class; from nearly 60 applicants, 34 were accepted. The students formed eight teams, each applying as a team to solve a specific government-sponsored problem. Accepted teams then prepared for their first class by interviewing 10 stakeholders—typically front-line military personnel experiencing the problem firsthand. During the next 10 weeks, each team interviewed between 100 and 150 users, tested countless hypotheses and prepared weekly presentations that demonstrated how fast the teams were learning about their chosen problem.

H4D motivated the teams to get outside the building to experience their challenges. For Team AquaLink, this meant gearing up in Navy dive suits. Team Right of Boom donned explosive ordnance disposal suits to experience impeded mobility, in order to determine the feasibility of a virtual tool to help foreign national military and law enforcement agencies counter improvised explosive threats. Team Skynet, working to increase the situational awareness of small tactical teams and reduce their cognitive load through the use of drones, simulated the cognitive strain of combat by running an obstacle course carrying 40-pound sandbags. Across the board, all teams invested time, sweat and tears to search for solutions.

CONCLUSION

H4D continues to expand, driven by demand for passionate and talented student teams to work on national security problems. Both the students and the sponsoring government organizations derive tremendous value from the intensive and challenging process. Several of the teams' solutions are going forward—some funded by private investors and others by government agencies—but that is not the point of H4D.

Students in an H4D course learn a new way of thinking about problems. What's more, they are able to experience national service in a unique way. H4D lets students work on difficult problems that affect the people who protect them. The students develop an empathy and affinity for the military, and many are now considering careers in national security.

In addition, participating government organizations learn the lean methodology alongside H4D students and gain a common language for innovation. Government participants and students also build relationships that will improve networking and collaboration, particularly as students build careers after graduating. These shared lessons and relationships are the essence of the H4D "Innovation Insurgency": training and educating current and future leaders in government, academia and industry with a goal of hardwiring the national security enterprise to solve mission-critical problems with speed and innovation.

For more information for universities and government sponsors interested in H4D, Georgetown University will host the next H4D Educators and Sponsors Course Jan. 17-19; email ***contact@h4di.org*** *for details. For more information on Hacking for Defense Inc. (H4Di), go to* ***http://www.h4di.org/****.*

MR. WILLIAM TRESEDER, a U.S. Marine Corps veteran, is co-founder and a partner at BMNT Partners LLC. In addition to directing Hacking for Defense, he is a co-founder of WorkScouts, which connects manufacturing companies with veterans, and a co-founder of NeuBridges, which trains West African entrepreneurs and educates investors about the rewards and risks of doing business in West Africa. He holds a B.A. in science, technology and society from Stanford University.

MR. DARREN HALFORD is a principal at BMNT and is executive director of H4Di, the nonprofit organization expanding Hacking for Defense classes. A retired U.S. Air Force colonel with 25 years of service, he has flown more than a dozen different aircraft from the MC-130E to the MC-12 to the U-2, and completed three Pentagon assignments that included Air Force International Affairs and the Joint Staff J5's Iran Division. He holds an M.A. in organizational management from George Washington University, an M.A. from the Air Force School of Advanced Air and Space Studies and a B.S. in mechanical engineering from Cornell University. He is also a graduate of Air Command and Staff College, the U.S. Army War College and the U.S. Department of State (Foreign Service Institute) National Security Executive Leadership Seminar.

TECHNICALLY SPEAKING

ROBOTS DEVELOPING MUSCLE MEMORY

Rosie the robot learns about the world, with help from a plethora of ARL-designed sensors.

by Dr. Joseph Conroy and Mr. Earl Jared Shamwell

If you ever watched "The Jetsons," an animated sitcom (1962-1964) about a family living in fictional Orbit City in the 2060s, you likely remember the iconic depiction of a futuristic utopia complete with flying cars and robotic contraptions to take care of many human needs. Robots, such as sass-talking housekeeper Rosie, could move through that world and perform tasks ranging from the mundane to the highly complex, all with humanlike ease.

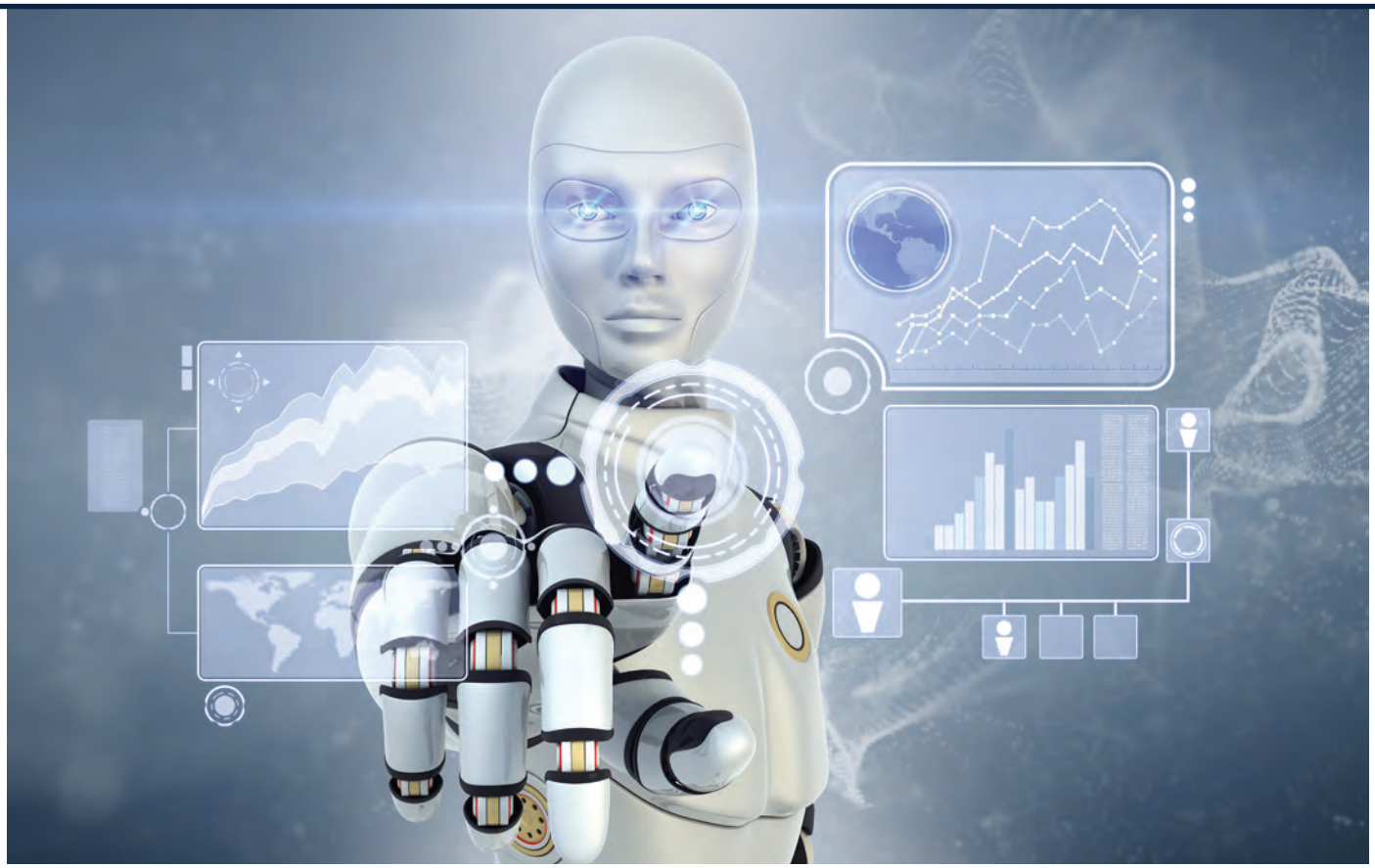
In the real world, however, robotic technology has not matured so swiftly.

What will it take to endow current robots with these futuristic capabilities? One place to look for inspiration is in human behavior and development. From birth, each of us has been performing a variety of tasks over and over and getting better each time. Intuitively, we know that practice, practice and more practice is the only way to become better at something. We often say we are developing a "muscle memory" of the task, and this is correct in many ways. Indeed, we are slowly developing a model of how the world operates and how we must move to influence the world. When we are good at a task—that is, when our mental model well captures what actually happens—we say the task has become second nature.

'WHAT A PIECE OF WORK IS A MAN'

Let's consider for a moment several amazing tasks performed by humans just for recreational purposes. Baseball players catch, throw and hit a ball that can be moving faster than 100 miles per hour, using an elegant fusion of visual perception, tactile sensing and motor control. Responding to a small target at this speed requires that the muscles react, at least to some degree, before the conscious mind fully processes visually what has happened.

The most skilled players of the game typically have the best mental models of how to pitch, hit and catch. A mental model in this case contains all the prior knowledge and



THE MANAGER OF THE FUTURE

Researchers at ARL are exploring methods for robots to learn and use models that enable faster autonomy by assessing when and under what conditions different methods of sensing perform well or poorly. (Image by iLexx/iStock)

experience a player has about how to move his or her body to play the game, particularly for the position. The execution of an assumed mental model is called "feed forward control." A mental model that is incorrect or incomplete, such as one used by an inexperienced player, will reduce accuracy and repeatability and require more time to complete a task.

We can assume that even professional baseball players would need significant time to adjust if they were magically transported to play on the moon, where gravity is much weaker and air resistance is nonexistent. Similarly, another instance of incorrect models can be observed in the clumsy and uncoordinated movements of quickly growing children; their mental models of how to relate to the world must constantly change and adapt because they are changing. Nevertheless, humans are quite resilient to change and, with practice, they can adapt to perform well in new situations.

A major focus of much current research at the U.S. Army Research Laboratory (ARL) is creating a robot like Rosie, capable of learning and executing tasks with the best precision and speed possible, given what we know about our own abilities.

NOT QUITE 'INFINITE IN FACULTY'

In general, we can say that Rosie-like robot performance is possible given sufficient advances in the areas of sensing, modeling self-motion and modeling interactions with the world.

Robots "perceive" the world around them using myriad integrated sensors. These sensors include laser range scanners and acoustic ranging, which provide the distance from the robot to obstacles; cameras that permit the robot to see the world, similar to our own eyes; inertial measurement sensing that includes rate gyroscopes, which sense the rate of change of the orientation of the robotic device; and accelerometers, which sense acceleration and gravity, giving the robot an "inner ear" of sorts. All these methods of sensing the world provide different types of information about the robot's motion or location in the environment.

Sensor information is provided to the algorithms responsible for estimating self-motion and interaction with the world. Robots can be programmed with their own versions of mental models, complete with mechanisms for learning and adaptation that help encode knowledge about themselves and the environment in which they operate. Rather than "mental models," we call these "world models."

'IN FORM AND MOVING HOW EXPRESS AND ADMIRABLE'

Consider a robot acting while assuming a model of its own motion in the world. If the behavior the robot actually experiences deviates significantly from the behavior the robot expects, the discrepancy will lead to poor performance: a "wobbly" robot that is slow and confused, not unlike a human after too many alcoholic beverages. If the actual motion is closer to the anticipated model, the robot can be very quick and accurate with less burden on the sensing aspect to correct for erroneous modeling.

Of course, the environment itself greatly affects how the robot moves through the world. While gravity can fortunately be assumed constant on Earth, other conditions can change how a robot might interact with the environment. For instance, a robot traveling through mud would have a much different experience than one moving on asphalt. The best modeling would be designed to change depending on the environment. We know there are many models to be learned and applied, and the real issue is knowing which model to apply for a given situation.

Robotics today are developed in laboratory environments with little exposure to the variability of the world outside the lab, which can cause a robot's ability to perceive and react to fail in the unstructured outdoors. Limited environmental exposure during model learning and subsequent poor adaptation or performance is said to be the result of "over-fitting," or using a model created from a small subset of experiences to maneuver according to a much broader set of experiences.

CONCLUSION

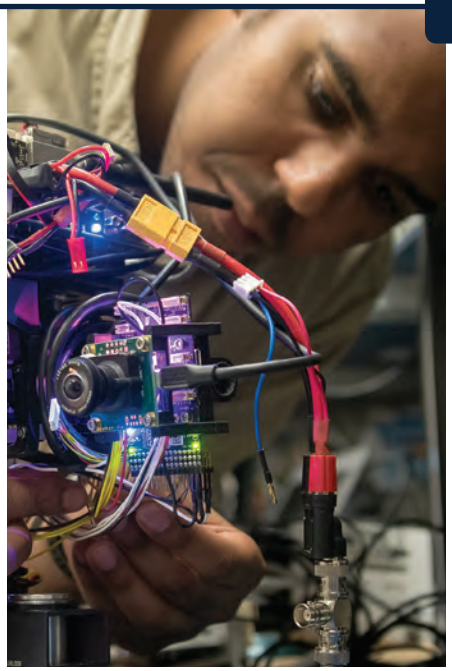
At ARL, we are researching specific advances to address these areas of sensing, modeling self-motion and modeling robotic interaction with the world, with the understanding that doing so will enable great enhancements in the operational speed of autonomous vehicles.

Specifically, we are working on knowing when and under what conditions different methods of sensing work well or may not work well. Given this knowledge, we can balance how these sensors are combined to aid the robot's motion estimation.

A much faster estimate is available as well through development of techniques to automatically estimate accurate models of the world and of robot self-motion. With the learned and applied models, the robot can act and plan on a much quicker timescale than what might be possible with only direct sensor measurements.

Finally, we know that these models of motion should change depending on which of the many diverse environmental conditions the robot finds itself in. To further enhance robot reliability in a more general sense, we are working on how to best model the world such that a collection of knowledge can be leveraged to help select an appropriate model of robot motion for the current conditions.

If we can master these capabilities, then Rosie can be ready for operation, lacking only her signature attitude.



WIRED FOR DISCOVERY
Earl Jared Shamwell, one of the authors, sets up a multisensor robotics test bed to collect images, light detection and ranging data and inertial measurements. Researchers aim to improve robotic performance by closing the gap between what a robot expects to happen and what actually happens. (Photo by Jhi Scott, ARL)

For more information about ARL collaboration opportunities in the science for maneuver, go to ***http://www.arl.army.mil/opencampus/****.*

DR. JOSEPH CONROY is an electronics engineer in ARL's Micro and Nano Materials and Devices Branch, Adelphi, Maryland. He holds a doctorate, an M.S. and a B.S., all in aerospace engineering and all from the University of Maryland, College Park.

MR. EARL JARED SHAMWELL is a systems engineer with General Technical Services LLC, providing contract support to ARL's Micro and Nano Materials and Devices Branch. He is working on his doctorate in neuroscience from the University of Maryland, College Park, and holds a B.A. in economics and philosophy from Columbia University.

MR. ANTHONY C. DUNAWAY

COMMAND/ORGANIZATION:
411th Contracting Support Brigade, U.S. Army Expeditionary Contracting Command

TITLE:
Government Purchase Card Branch chief; supervisory procurement analyst

YEARS OF SERVICE IN WORKFORCE: 6

YEARS OF MILITARY SERVICE: 24

DAWIA CERTIFICATIONS:
Level III in contracting; Level I in logistics and program management

EDUCATION:
MBA, University of Phoenix; B.S. in resource management, Troy University

AWARDS:
Commander's Award for Civilian Service; Army Achievement Award (Civilian)

TRAINING CARDHOLDERS AND CUSTOMERS
The GPC Branch provides live training to cardholders. Dunaway and his team ensure that cardholders use their government-issued cards appropriately—work that won recognition from the deputy assistant secretary of the Army for procurement. (Photos by Lt. Col. Steven D. Gutierrez, 411th CSB)

The challenges and rewards of OCONUS work

Anthony Dunaway is a busy guy. As Government Purchase Card (GPC) Branch chief and supervisory procurement analyst for the 411th Contracting Support Brigade (CSB) at Yongsan Garrison, South Korea, he manages a robust program of more than 1,200 card accounts, supporting warfighters in the U.S. Forces Korea (USFK) theater of operations. The operational tempo is high, with many of the situations supported by Dunaway and his team time-sensitive or requiring immediate action to fulfill mission requirements.

Between Oct. 1, 2015, and Sept. 30, 2016, the branch reviewed and monitored 32,446 transactions that totaled $31.44 million and processed more than 2,300 applications from cardholders and billing officials. The branch also provided GPC live training to more than 1,500 cardholders, billing officials and resource managers, and provided timely GPC support to 28 rotational units supporting the 2nd Infantry Division. For that work, the branch received an "exceptional" rating during a July-August 2016 procurement management review conducted by the Office of the Deputy Assistant Secretary of the Army for Procurement.

"We support all of the branches of service here in USFK, so the phone calls, emails, office visits and requirement requests flow in at a high rate each and every day," said Dunaway. "Something new or different always seems to surface, and it's never the same

thing twice. I've never had a job where I worked hard all day and left to go home with more work [remaining] to do the next day—and there is never an idle moment."

The biggest challenges he faces? Turnover and time differences. "A large number of our customers are here on one-year tours, so once we establish a good rapport, they leave and it is déjà vu all over again," said Dunaway. "We do our best to overcome this by keeping communications open so we are prepared for the transitions to make them as seamless as possible."

The time difference in Seoul—14 hours ahead of EST—adds another layer of complexity. "Sometimes it is a challenge to communicate with vendors that are located stateside," he said. "And, because we are geographically separated from the United States, the shipping and receiving of critical parts can take longer than desired."

Given the OCONUS location, finding a vendor to meet some of the requirements can be a challenge, Dunaway said, and the language barrier often further complicates things. To combat that hurdle, the team includes people fluent in English and Korean. Having a good team of attorneys also helps, he added. "The business practices here are much different than what I was accustomed to: Local vendors will attempt to 'reward' the procuring activities with gifts during the holidays. Fortunately, we get great ethics briefings from our offices of counsel on how to handle those situations."

Dunaway came to the Army after a three-decade career in the Air Force. "I initially planned to join for four years, as a way to pay for my college education. I left 24 years later, having also earned an MBA, so I'd say it was an excellent decision." He retired in 2010 as a master sergeant, after spending most of his career in weapons and acquisition logistics. During his Air Force service, he was a billing official in a program that was managed by the Army and he became interested in how well the Army supported Air Force requirements. "When I retired from the Air Force, I had an opportunity to work for the Army in the GPC program, and it has been a pleasure right from the beginning," he said.

The transition from one branch of service to another has been relatively smooth, he added. "There is really not much difference between Army contracting and Air Force contracting, with the exception of service-unique requirements that allow the Air Force to procure items that the Army doesn't and vice versa," he said.

KNOWLEDGE TRANSFER
Open lines of communication and keeping training current are priorities for Dunaway's GPC Branch, given high turnover in the customer base. Many of the cardholders Dunaway assists are in Korea on one-year tours.

Helping to make that change fairly easy was an early supervisor: Andre Pelliccia, GPC agency and organization program coordinator and certified charge card manager with the Business Oversight Branch in the Fort Worth District of the U.S. Army Corps of Engineers. "He was an excellent mentor, as he assisted me with the change from the Air Force climate to the Army climate, and he was also an advocate of education and self-improvement," Dunaway said. "Acquisition is a constantly changing environment, so it is important to continuously learn to keep up with the changes."

For Dunaway, the best learning opportunity so far has been the Army Acquisition Intermediate Contracting Course; he was able to obtain all of the necessary requirements to achieve Level II certification in contracting in four weeks. But one class isn't sufficient, he noted. "Earn a bachelor's degree in business and perhaps a master's degree as well," he said. "And keep an open mind: Acquisition is fast-paced. Take advantage of all of the education and training opportunities that the Army has to offer."

—MS. SUSAN L. FOLLETT

(Image by the U.S. Army Acquisition Support Center)

SPEED CONTRACTING

DIUx, DOD's outreach to the tech community, has developed 'commercial solutions opening,' an OTA mechanism that moves from first contact to final contract in 60 days or less. And DIUx is sharing its guidebook to CSO with the rest of the federal government.

by Mr. Michael Bold

When Secretary of Defense Ash Carter started the Defense Innovation Unit Experimental (DIUx) in August 2015 in a bid to re-establish DOD's once-robust ties to the technology innovation of Silicon Valley, DIUx needed to find a way to move "at the speed of business."

Silicon Valley considered the department a bad customer, if it considered DOD at all. The federal government's normal contracting process, guided by the Federal Acquisition Regulation (FAR), could take six months to a year (and in some cases considerably longer). Silicon Valley's tech companies expect to move from proposal to contract in a couple of months, if not weeks.

When Carter announced a refocused DIUx 2.0 in May 2016 under its new managing partner, U.S. Air Force fighter-pilot-turned-entrepreneur Raj Shah, he also announced that he had requested $30 million to direct toward nontraditional companies with technologies—already commercially available or soon to be released—that could be used to meet military needs. (Carter has since opened a DIUx office in Boston and a presence in Austin, Texas.)

X FOR EXPERIMENTAL

Secretary of Defense Ash Carter is greeted by DIUx Managing Partner Raj Shah as he arrives at Moffett Field, California, to deliver remarks on May 11, 2016. With them is Maj. Gen. Nick Tooliatos, commanding general of the U.S. Army Reserve 63rd Regional Support Command. Carter "refocused" the experimental unit, with Shah at the helm, on finding ways for DOD to do business as quickly as the tech companies innovating and experimenting in DOD areas of interest. (Photo by Senior Master Sgt. Adrian Cadiz, Office of the Secretary of Defense Public Affairs)

A JOINT EFFORT OF DIUX, ACC

Seeking ways to get DOD up to Silicon Valley's speed of business, DIUx, with help from the Army Contracting Command – New Jersey (ACC-NJ), came up with the commercial solutions opening (CSO). In contracting parlance, a CSO is a solicitation instrument allowing for the award of other transaction authority (OTA) agreements that DIUx has used to award $36 million in contracts so far. Using a CSO, the time from when a Silicon Valley entrepreneur with a promising company or technology first responds to a DIUx proposal to when a contract is signed has averaged 59 days, said Lauren Schmidt in an October 2016 interview with Army AL&T. Schmidt is pathways director for DIUx and a former special assistant to the principal deputy assistant secretary of the Army for acquisition, logistics and technology. The fastest contact-to-contract was 31 days, she said.

The National Defense Authorization Act for Fiscal Year 2016, signed in November 2015 by President Obama, encouraged broader, more effective use of OTA agreements, which are not subject to FAR documentation and reporting requirements. In late November 2016, DIUx released a guide on CSOs and OTAs to enable other federal government organizations to set up their own innovative contracting vehicles. "Our goal from DIUx is that more organizations in DOD can use this type of authority and design particular processes that meet their particular needs," Schmidt said. "It doesn't have to be exactly the way that we did the CSO. There's lots of ways you can design a process so it meets the needs of your particular organization."

STRAIGHTFORWARD SYSTEM

The CSO process is fairly simple, Schmidt explained. First, DIUx posts basic areas of interest on its website. These aren't detailed requirements, she said, but descriptions of a problem DIUx is trying to solve or a technology it's interested in. Interested companies submit a paper—fewer than five pages of text, or briefing charts—on the company or its technology, generally required within about two weeks. "We want to have a low barrier of entry to companies that have not worked with DOD before, have not put together a government proposal before," Schmidt

The CSO process at a glance:

- Open to nontraditional companies and traditional defense companies under certain conditions.
- A streamlined application process requiring only minimal corporate and technical information.
- Flexibility to use best practices with relief from the FAR.
- No mandatory cost accounting standards or reporting requirements.
- No requirement for certified cost and pricing data.
- Fast-track selection timelines, with most awards within 30 calendar days of proposal submission.
- Negotiable payment terms.
- Nondilutive capital (financing that does not dilute company owners' shares).
- Negotiable IP rights.
- Direct feedback from operators, customers and users within DOD to help product teams develop and hone product design and functionality.
- Potential follow-on funding for promising technologies and sponsorship of user test cases for prototypes.
- For successful products and technologies, possible eligibility for accelerated procurement by DOD.

(SOURCE: DIUx)

said. "So for this first step, they can just use information they probably already have on hand," instead of what can often be a costly and time-consuming proposal development process.

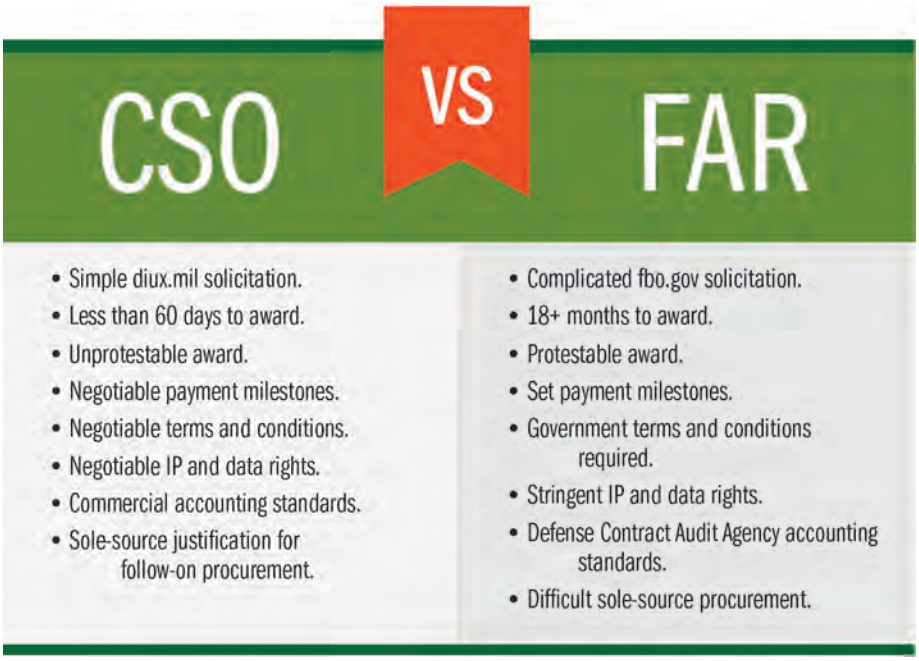
Next, DIUx, acting in a sort of venture capitalist role, selects companies to pitch their technologies to its DOD customers. (DIUx officials are quick to point out that it is not a venture capitalist.) Finally, if DIUx, ACC-NJ and the DOD customer think the company or technology has promise, the company is invited to submit a full proposal and negotiate an OTA. Under a CSO, nearly all terms, including intellectual property (IP), are negotiable.

"This whole process is fast, flexible and collaborative, and these three attributes are really critical to our ability to work with a lot of these nontraditional companies," Schmidt said. Most important, she noted, is the collaboration. "Rather than the government issuing a detailed RFP [request for proposal] that the contractor has to respond to behind a firewall, in isolation and without discussions with the DOD customer, we actually burn down that firewall and design projects together after we issue an RFP."

DIUx's CSO is a pilot in the use of this type of contracting instrument, said Paul Milenkowic, ACC-NJ executive director. "We can move quicker in that we're not bogged down on a lot of procedural time frames or steps that don't apply to other transaction agreements," he said. "So one benefit is that we can focus more on the desired outcome versus 'are we following the proper steps.' "

FLEXIBILITY ALLOWS SPEED

The key to the CSO's speed is the flexibility that OTAs allow as opposed to the FAR, Milenkowic said. "The FAR's going to define steps and time frames—a lot of them are dictated by the regulation," he said. "With that flexibility in the commercial solutions opening, we've created efficiencies in the process that we wouldn't otherwise have the ability to do under the FAR. … The FAR is more rules-oriented versus the other transaction authority."



THE DIUX DIFFERENCE

How DIUx does contracting, versus the standard way. For high-tech products made by smaller, nontraditional defense contractors, the CSO contracting method can work better than the methods that often work with big defense firms. (SOURCE: DIUx)

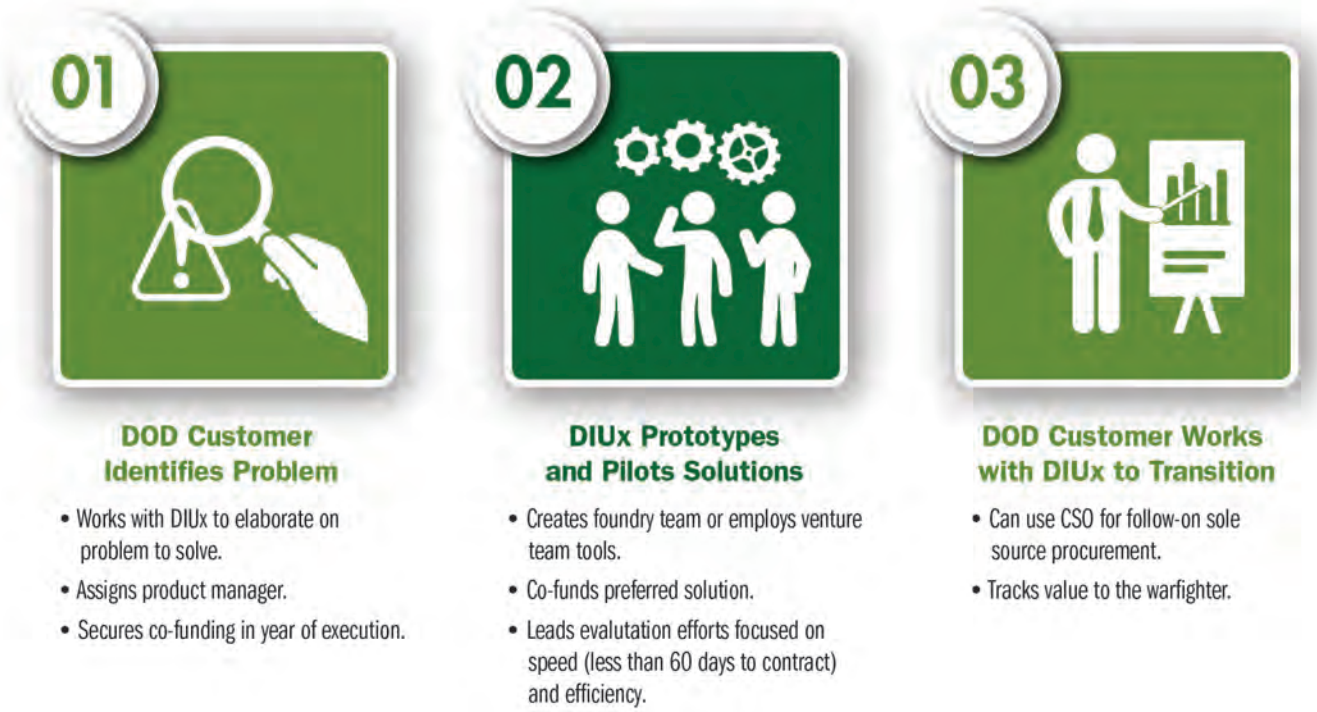
But moving quickly doesn't mean sloppiness, Milenkowic emphasized. "We're not doing speed at the expense of quality." Ensuring quality requires two things, he said. "The first is people. … We have a mature staff here that we've developed over the past few years at ACC – New Jersey, and to me that's essential, as there's a higher level of engagement, communication and interaction required and one has to feel comfortable taking this additional responsibility on."

The second is a solid partnership. "The other thing that's helped us is the entire DIUx team has been highly aligned in that we're all on the same page, we understand the process that we laid out, and we understand the goals we're working toward. The team also has a high degree of commitment, and that includes the staff at DIUx, the staff here at ACC – New Jersey and our local legal support as well," he said.

ENHANCED COLLABORATION

CSOs provide an element of collaboration that's not possible under the FAR, Milenkowic said. "Essentially, the CSO has turned the process on its head by asking commercial firms to provide a solution to our problem statement, and this is typically not what the government does," he said. "We usually are dictating a solution, and here we are asking for one. And therefore we might have vastly different approaches to solving a problem."

CSOs also allow enhanced interaction between the stakeholder and the contractor. Once a contractor is selected—typically a



DOD FINDS PROBLEM, INDUSTRY FINDS SOLUTION

DIUx sought to simplify its processes enough so that businesses of any size could compete to provide solutions to defense problems. The venture team mentioned in the second step functions like a venture capital firm, while a foundry team is similar to a technology incubator. (SOURCE: DIUx)

company that hasn't done business with DOD or the government before—ACC-NJ and DIUx will help with the content of the proposal and the scope of the project. The collaboration with the contractor, Milenkowic said, "allows us to adjust the project as we go along and as we conclude negotiations. We're getting more insight and input from the contractor in that process. So we like to think that in the end we're going to be optimizing that solution in a better manner."

CONCLUSION

In recent years, senior leaders in DOD and the congressional armed services committees have focused on reform as a way to speed up the acquisition process. Their efforts have resulted in new authorities and organizations designed to help DOD access the technology it requires, particularly from new commercial sources.

Founded as a way to reach into Silicon Valley's innovation culture, DIUx, with ACC-NJ's help, finds itself at the forefront of a trend in acquisition innovation. DIUx has pioneered ways to bring in nontraditional defense contractors to provide next-generation capabilities that in the past would have been out of DOD's reach. Among its early agreements are plans for unmanned sailboats to collect climate and other data; small unmanned aerial vehicles that provide Soldiers critical situational awareness in caves and buildings; and hands-free, ears-free, two-way removable communication devices hidden in the mouth that integrate wirelessly with radios and offer clear communications in high-noise environments.

The November release of DIUx's guidebook provides the means for organizations across the DOD acquisition enterprise to break up logjams in filling capability gaps, working in timelines of days and weeks instead of months and years.

For more information, go to ***https://www.diux.mil/****.*

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CONTRACT OPTIMIZATION PAYS BIG DIVIDENDS

Being a good steward of taxpayer dollars means thinking and acting decisively. That's just what expeditionary contracting organizations in Afghanistan did—examining and consolidating the contracts under their purview to make it easier and cheaper for operational commanders to obtain services for their troops.

by Mr. Gordon Jones

Sustaining joint forces to train, advise and assist the Afghan National Police and Afghan National Army requires the efficient use of contract resources. Within 30 days of standing up the Contingency Contract Administration Service (CCAS) team's mission in Afghanistan, senior staff elements of U.S. Forces – Afghanistan (USFOR-A) approached the U.S. Army Expeditionary Contracting Command – Afghanistan (ECC-A) for assistance to move to a single service provider in southern Afghanistan.

Maj. Gen. Jeffrey L. Bannister, then deputy commanding general of USFOR-A, directed a comprehensive optimization of all contracting actions to eliminate duplicate services, improve operational efficiency, reduce costs, reduce contractors in the battlespace and improve government oversight. Termed Operation Firm Investment, the optimization initiative looked at Kandahar Airfield (KAF), where two major service providers were providing essentially the same basic life support services.

A COMPLEX EVALUATION

To provide this assistance, Col. Carol M. Tschida, ECC-A commander, tasked the senior CCAS staff to perform best-value analysis that focused on operational efficiencies aligned to organizational structures. The desired result of that analysis was to provide cost reductions and benefits to the U.S. government without impacting the readiness of the warfighter.

"This analysis was one of the most complex evaluations I have been involved with because of the fundamental differences between the two primary service providers involved at KAF," Tschida said. On one hand is the Logistics Civil Augmentation Program (LOGCAP), which uses a cost-plus-fixed-fee contract that provides a matrix of services over more than 80 performance work statements. The work statements are aligned to functions, such as facilities maintenance, roads and grounds and power generation, so any individual requirement might involve multiple statements.

POINTING OUT THE DETAILS
ECC-A property book officer Michael L. Mangum, left, and Maj. Reuben T. Joseph, chief of the Regional Contracting Office – South, discuss the operations of the main reverse osmosis water purification unit at KAF. Joseph was the KAF transition coordinator for the ECC-A Regional Contracting Office – South, ensuring that services were provided without interruption during the transition from NATO contracts to LOGCAP. (Photos courtesy of the author)

Three LOGCAP contracts are multiple-award task order contracts. These three contracts require compliance with the Federal Acquisition Regulation (FAR), Army regulations and technical compliance regulations.

The other service provider is the NATO Support and Procurement Agency (NSPA), which uses firm-fixed-price contracts that are geared toward meeting a particular requirement or group of requirements in a holistic manner. These NSPA contracts are exempt from compliance with U.S. contract law or the FAR, and the contract compliance and oversight requirements are not as stringent or structured as those under LOGCAP. This disparity in contract methodology added a layer of complexity to the analysis and comparison that was unlike anything one normally experiences during a contracting career.

After several months of intense deep-dive analysis, Bannister decided to move toward LOGCAP as the primary service provider in southern Afghanistan, citing performance synergies obtained across the hub-and-spoke performance locations in the region, the increased contract performance surveillance networks available through DOD and the lower cost to the government. This decision reinforced migration toward a single service provider—LOGCAP—which also is the U.S. Army's logistics program of record to support contingencies.

The decision encompassed locations across southern Afghanistan, including KAF and forward operating bases at Shorab and Dwyer, and involved a phased approach whereby LOGCAP would assume functions over time as the existing NSPA contracts reached the end of their periods of performance, in order to avoid early termination penalties.

It also resulted in a single "belly button," or responsible party, for most services, to ease the burden on the operational commanders to obtain faster and more cost-effective services for their troops. "This decision was a win-win for USFOR-A, the Resolute Support commanders and the taxpayers," Tschida said, "as movement to LOGCAP is projected to result in savings of over $30 million per year."

LOGCAP TRANSITION

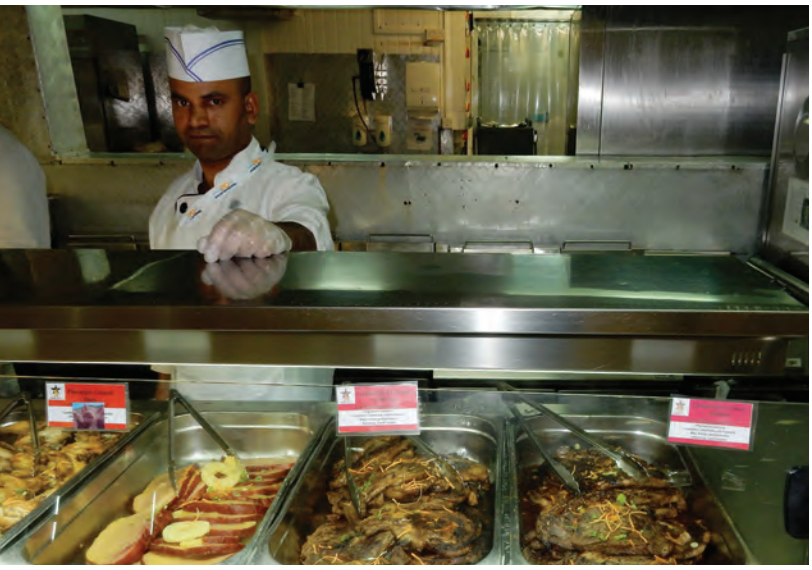
Following the USFOR-A decision to move to LOGCAP, the overall involvement of the CCAS team was just beginning. Because of the timing of the USFOR-A decision, less than 45 days remained for the initial transition to occur between LOGCAP and NSPA. In a contingency environment, the transition had to be seamless: a lapse in service could have a negative impact on ongoing operations.

To assist in the transition, Tschida immediately increased the number of quality assurance (QA) specialists and sent a property book officer and property administrator to coordinate the inventory and conversion of NATO-furnished property to government-furnished property accountable under the LOGCAP contract. This in itself was a challenge because transferring NATO property laterally to a U.S. contract is a new area, requiring innovative processes and solutions.

Next, CCAS QA specialists conducted training for all of the contracting officer's representatives (CORs), including providing assistance with generating and implementing detailed contract performance surveillance checklists and schedules to ensure contractor compliance with the terms and conditions set forth in the contract. This, too, proved challenging: Under NSPA, all oversight was provided by the NSPA Program Office, so there were no U.S. CORs on ground and familiar with the specific tasks being performed. This meant that CORs had to be nominated, trained, approved, appointed and added to the DOD COR Tracking Tool, all in a matter of days.

MAPPING IT OUT

Lt. Col. Gregory C. McMahan, USFOR-A Joint Engineering, discusses the layout and electrical generation capacity with LOGCAP contractor employees assigned to the North Prime Power Plant at KAF, where two contracts provided essentially similar life support services. KAF was one of the locations analyzed under Operation Firm Investment, a comprehensive optimization of all contracting actions that aimed to eliminate duplicate services, improve operational efficiency and reduce contractors in the battlespace.



CONSIDERING THE OPTIONS

Analyzing which contract vehicle was best to support dining facilities like this one and other services at KAF was complicated by differing contract terms and structures, and implementing the change to the better option was made difficult by the lack of appropriate contract support personnel in theater.

Maj. Reuben Joseph was the KAF transition coordinator for the ECC-A Regional Contracting Office – South. "The transition involved countless issues, each having the capability to result in an unacceptable gap in service," Joseph said. "The transition had a very short suspense, made more complex as it was simultaneously occurring at three different locations. Obviously, you tend to concentrate on the life, health and safety issues—power, water and food—but each of the secondary functions had to be checked and cross-checked to ensure that uninterrupted continuation of services was maintained. Because of the hard work on the part of LOGCAP and their prime contractor, the transition was nearly flawless and executed without a gap in any of the services."

CONCLUSION

When Bannister first approached ECC-A to assist in this analysis, his guidance was clear: "Nothing is off the table. Consider all strategic, operational and fiscal variables; the process and end state is to measure twice, cut once." Working from this vision, the ECC-A team joined forces with the USFOR-A Operational Contract Support and J4 cells to form a cohesive unit and deliver a viable recommendation to the leadership.

"Despite the complexity of the transition, the end result was a resounding success," said Tschida, "a team effort from start to finish." The success of this effort will serve as a springboard for phase II of the transition, she said, scheduled to occur on Jan. 1, 2017, when the additional services of laundry, janitorial, chemical latrines and the Giant Voice system move from NSPA to LOGCAP. "We'll be ready," said Tschida. "We have a great team that is committed to the mission and [has] never lost sight that the ultimate objective was to provide uninterrupted service to the warfighter and all supporting personnel. The decision to expand the LOGCAP operations in southern Afghanistan will result in increased contract obligations of approximately $750 million over the next five years for ACC."

With ECC-A, it was, is and always will be, "one team, one fight." We remain engaged, capable and committed.

For more information, contact the author at ***gordon.jones.civ@mail.mil****.*

MR. GORDON JONES is coordinator for CCAS, ECC-A. He holds an MBA, a B.S. in physics and biology and a B.A. in management from the University of Alabama in Huntsville. He is Level III certified in contracting and Level II certified in property management, and is a member of the Army Acquisition Corps.

SOLVING THE PUZZLE

Steve Blank, a retired Silicon Valley serial entrepreneur and a lecturer at the business schools of Stanford University and the University of California, Berkeley, introduced then-Col. Peter Newell to his "Lean Launch-Pad" methods: Identify the problem, validate it with end users and then test possible solutions. The two men realized that Newell had been doing essentially the same thing with the REF. When Newell retired from the Army and joined BMNT, he and Blank got to work refining the approach to solve U.S. military challenges with help from Silicon Valley. (Image by U.S. Army Acquisition Support Center (USAASC))

SPEED AND URGENCY IN SILICON VALLEY

Peter Newell

Jackie Space

With a startup mindset, military know-how and a wide-ranging network of technology partners, Peter Newell, the former head of the Army's Rapid Equipping Force, and Jackie Space, a former Air Force officer and space systems program manager, work to construct a bridge between DOD and the high-tech innovators of Silicon Valley through BMNT Partners.

To get lifesaving technologies to the battlefield, BMNT brings together defense officials, warfighters and experts in computing, big data, cybersecurity, energy, robotics and other areas that have military applications—and which are now dominated by tech companies, not traditional defense contractors. Using cutting-edge methodologies developed in Silicon Valley, BMNT gets a diverse roomful of people working together on finding rapidly deployable solutions to battlefield problems.

BMNT was founded in Palo Alto in 2011 by Joe Felter, a retired U.S. Army Special Forces colonel, after he returned from Afghanistan, his final deployment. Felter had earned a doctorate at Stanford University in 2005 and was a U.S. Army War College fellow at Stanford's Hoover Institution from 2008 to 2009. During his time in Palo Alto, Felter developed a strong network of entrepreneurs, investors, engineers and academics interested in national defense. At the fledgling company, named BMNT after the military term meaning "begin morning nautical twilight," the time of day when the sun is still below the horizon but light is just beginning to appear (the best time to attack and the worst to defend), Felter used this network to find consulting and advisory work focused on helping tech companies interested in working with the military.

In 2012, Felter met Army Col. Peter Newell, director of the Army's Rapid Equipping Force (REF), who was visiting Stanford faculty members to get ideas for the REF. The Army had given Newell command of the REF after he served two tours in

SHOW OF HANDS
BMNT co-founder and managing partner Peter Newell, right, interacts with students in Stanford University's Hacking for Defense (H4D) class. Like BMNT, the class leverages a problem-solving mentality and a diverse set of viewpoints to focus on finding rapidly deployable solutions. (Photo by Rod Searcey, Stanford News Service)

Iraq, including leading an infantry task force in the second Battle of Fallujah, in 2004, for which he was awarded a Silver Star, and later commanding a brigade combat team in the southern Iraq border region, responsible for halting the inflow of weapons and fighters from Iran.

During Newell's many trips as REF chief to Silicon Valley, Felter organized "garage crawls" to expose Newell to potential tech solutions for REF's problems. BMNT's website notes one particularly important trip, when a senior Google executive was blunt:

" 'We don't want your money; we want your problems.' This reinforced to Pete what he already suspected—that the key to engaging Silicon Valley was not through government money, which is limited and difficult to access, but by challenging these entrepreneurs and visionaries with DOD and other government agencies' problems."

Although many believed Newell was in line to get a star and remain in the Army, instead he retired and later joined Felter and William Treseder, a Marine veteran and Stanford alumnus, to form a new company called BMNT Partners LLC. Today they simply refer to the company as BMNT.

As Newell was driving across the country to take the reins at BMNT, he got a phone call from Jackie Space, a former U.S. Air Force officer who had worked with Newell when he headed REF, coordinating his West Coast operations. "I called him up and said, 'Hey, can I come help you out in whatever it is that you're doing with the startup?' And that's when I became the first employee at BMNT," Space said in an October interview she and Newell did with Army AL&T.

While Newell was getting started with BMNT, he met Steve Blank, a Silicon Valley legend and serial entrepreneur. (See sidebar, Page 126.) After either founding or working for eight startups during a 21-year career, Blank had begun teaching his "Lean LaunchPad" methods at the business schools at Stanford and the University of California, Berkeley. Newell and Blank realized that what Blank was teaching was precisely what Newell had been doing with REF: finding a battlefield problem and assembling a team to validate the problem, test possible answers and develop technologically informed solutions. BMNT dubbed the process Hacking for Defense, or H4D. Later, BMNT and Blank combined to teach a class at Stanford also called Hacking for Defense, in which students formed teams to find solutions to problems provided by government defense and intelligence agencies. (See "Hacking for Defense," Page 99.)

BMNT's work has gotten the Pentagon's attention, and Forbes magazine recently included BMNT in its list of the top 25 veteran startups. One of the company's clients is the Defense Innovation Unit Experimental (DIUx), Secretary of Defense Ash Carter's outreach to the tech community. (See "Speed Contracting," Page 108.) Other clients include the Joint Improvised-Threat Defeat Organization, the National Geospatial-Intelligence Agency, the Defense Intelligence Agency and the MD5 National Security Technology Accelerator, which is part of the Manufacturing and Industrial Base

Policy office in the Pentagon. Newell and Space are also visiting senior research fellows at National Defense University. They talked about the evolution of BMNT with Army AL&T magazine.

Army AL&T: When you took over REF, and correct me if I'm wrong, you didn't know it existed.

Newell: No, I didn't. I got a note from the Colonels Management Office that said, "Congratulations, you're going to take over the Army's Rapid Equipping Force at Fort Belvoir, Virginia." And I literally had to Google it to figure out what it was. Considering that I was one of only six brigade [commanders] in Iraq, that wasn't a good thing.

I moved to D.C. in July, and I think took over REF at the end of the month. I knew nothing about acquisition, nothing about money, nothing about how things work in the Pentagon. I had all this fresh experience from theater, and I was pissed off that the organization had "overlooked" my brigade in Iraq.

We've been maybe viewed as being competitive to defense contractors, which I think is silly. We know that the more work that gets done like this, the better off the programs will end up being when the government goes to write the requirements.

As I started my transition, I was given a list of people to talk to by my predecessor and warned ahead of time that there were many people in the Pentagon out to shut down REF, and that I should avoid talking to them until I had done the list of REF fans. I decided to take the opposite track and talk to those who weren't fans of REF so I could get an unbiased feel for what REF was doing, just to get a sense of where the problems were.

Back then, REF was, I would best say, on a targeting board by most of the folks in the acquisition community for their behavior over the past couple of years. Their relationship with the asymmetric warfare group was horrible, and the relationship they had with senior leaders in the acquisition community was horrible. Fortunately, because I hadn't yet formed an opinion, I had a great opportunity just to hear what people had to say. It was good for me.

Shortly after that, I took off and went to Afghanistan for a visit because I had not been there in several years and because that's where the bulk of our work was being done. I think it was October 2010. At that point, REF's headquarters in Afghanistan was in Bagram and there was a satellite office in Kandahar.

One of the stops included the product integration facility that RDECOM [U.S. Army Research, Development and Engineering Command] had just opened there. It was essentially a small manufacturing facility on Bagram that was the size of a warehouse, where they could make just about anything they wanted. It struck me that you could hear a pin drop in the place, because there was nothing happening. After my visit there, I went back to the REF office, where the REF lab guys [were] working night and day doing something in a room the size of a closet. I asked the guy that ran the place, "Why are you guys doing all this stuff internally when you've got that big old facility on the other side of the base?" I never really got a good explanation on why it was, other than, "This is the way we've always done it."

I took a flight down to Kandahar to see the other REF office and to visit units working there. I just happened to bump into a guy I had served with in the Ranger Regiment several years before. He was now in Kandahar commanding the first brigade that had gone into the city as part of the surge in 2010. We were standing at the edge of the airfield talking, and he looks like a cadaver. He'd been in this country, I think, six weeks. And at the time, he's losing, I don't know, 10 to 15 people a day.

At one point I asked him, "What can I do for you?" And his response to me kind of set me back a little. He just looked at me and said, "What I need most is for people to quit asking me what they can do, and just do something." What he meant was that he was so busy trying to fight the daily fight and keep people alive that he didn't have time to do analysis of what his problems were. What he really wanted was for somebody to look over his shoulder and anticipate what was going on, and hand him potential solutions for his guys to try. And he wanted it done in real time.

After that, I went to see the guy who commanded the second surge brigade into Kandahar. When I asked him what I could do to help, he said, "We're having a seriously hard time with IED [improvised explosive device] attacks against our

FROM SKETCH TO SOLUTION
Sketching out a problem on a napkin, while it may seem a crude approach to solving difficulties that Soldiers face on the battlefield, is a valuable form of intellectual currency in Silicon Valley, as BMNT co-founder Peter Newell discovered when he met his first startup CEOs. He learned that they thrived on tackling big problems and adopted the "napkin sketch" approach himself. (Image by USAASC)

dismounted squads. … Do something about that." I'd had all the briefings by the division staffs and everybody else, and IED attacks against dismounted forces didn't show up on anybody's priority list. Nowhere.

Later, I made one more stop, this time back at Bagram, where I went to see the guy who was the commander of the Joint Special Operations Task Force, another officer I had served with years earlier. When talking about the IED attacks, he became even more direct in what he wanted. He said, "Yeah, my biggest problem is my guys are getting whacked on the way to the objectives as they're walking in." And he said, "I need you to take all of that big, heavy-ass stuff you're building, you know, to go up and down roads, and I need you to shrink it down so it fits in the back of a Chinook and will operate long enough for us to get us to our objectives."

I was frustrated by the time I left Afghanistan because I thought REF was missing the fight. It appeared to me that REF had simply regurgitated in Afghanistan the model that they'd used in Iraq. By camping out in Baghdad in Iraq, REF had access to hundreds of thousands of people. But as we drew down in Iraq, there wasn't anybody in Baghdad anymore. And they weren't getting out at the edge of the battlefield. In Iraq, the model never changed and they missed my brigade in the south. In Afghanistan, they were doing the same thing. … they were camped out on the large bases, but this time well away from where the people who needed them most were operating.

In my mind, they really had become a very passive organization that said, "Yes, when people send us problems, we respond to them." But they weren't looking for anything, which I think was diametrically opposed to the way REF had started. Col.

Bruce Jette, the guy who designed REF, did an absolutely beautiful job with it. Unfortunately, between Bruce's departure and my arrival, you got folks who were in the execution mode, who started to celebrate, picking low-hanging fruit off trees and pitching it over the wall at people, and started reading their own press at how great they were and how jacked-up the acquisition community was. But what REF wasn't doing was helping anybody, other than those short, easy successes.

So when I left Afghanistan, I set out to find out why REF was so counter to what I thought they ought to be doing, and also figure out how to re-chart the course for it. Our analysis would show later that between the start of the surge in Afghanistan and when I got there and made defeating IED attacks against dismounted forces the No. 1 priority at REF, there was a six-month gap, and that six-month gap cost us probably 5,000 casualties.

Having left Afghanistan with kind of a mission in my mind, I spent the next year with a host of folks trying to figure out how to enable REF to focus more on finding problems, and then how to rebuild the organization so it constantly pushed itself to the edges of the battlefield.

Part of my time was spent looking for a professional development program that would help REF's workforce keep up with a rapidly changing world. I spent lots of time in the executive education courses at MIT, learning how businesses thought and how they handled problems. As I understood things better, I started sending batches of REF people to MIT executive ed courses to work on things.

We redid the way we spent money and created platforms by which our teams were moved out to the edges of the battlefield. We then spent our money [on] better understanding and validating the problems that they found, and then used that data to build coalitions of people to solve them.

Army AL&T: You actually put labs out on the battlefield, didn't you?

Newell: We absolutely did. I went so far as to build mobile prototyping labs—took a 40-foot [shipping container] and put in its own HVAC and power system. Added a VSAT [Very Small Aperture Terminal] to it and then loaded it with CNC [computer numeric-controlled] milling machines, 3-D scanners, 3-D printers and other essential prototyping tools. We manned the labs with a scientist, an engineer and a senior NCO who had combat experience in the theater. We then gave the labs to the divisions to move to the units in combat.

The role of the lab team was to reach out to the guys coming into the base from missions and grab problems from them as they came in. They then used the lab's prototyping capability to actually help us better understand things. It wasn't about building parts and things, although we did sometimes. It was about making sure we understood the problem and using that to help generate interest back in Washington, D.C., to actually solve it.

To cut a very long story short, I used that platform that we built, took my $200 million budget, and ended up spending $1.5 billion over the next two years, because we got so good at building these problem sets and building communities around them. By the time I left, we had people bringing us money and saying, "We know we're supposed to be working on X, but we can't get it done. Will you help us get started?"

As I got toward the end of my career there, I really got addicted to what we were doing.

Army AL&T: So how did you go from REF to Silicon Valley?

Newell: I had already moved my family five times in seven years. I was simply done uprooting their lives for the chance at another promotion. So I decided to retire.

During the process of the buildup for REF's problem-solving mechanism, I ended up in Silicon Valley looking for a solution to a particular robotics problem. And it just happened the day that I showed up at Stanford University to find a particular mechanical engineering professor, the guy who's my partner now, Joe Felter, had just retired from the job as the COIN [counterinsurgency] adviser to Gen. [David H.] Petraeus in Afghanistan.

He got his Ph.D. from Stanford, and when he retired, he went back to Stanford to work for [former Secretary of Defense] Bill Perry. Joe was assigned to escort me across the campus that day. Joe and I were wandering across campus, talking about the problems I had in Afghanistan. Instead of going back to the airport, we jumped in his car and he said, "Why don't you just come with me for a bit?"

And we went on what I would call a pub crawl of startups, where we'd pull into some garage where he knew folks, and I'd sit down with the CEO of the startup. I'd talk about my problems and he'd talk about what they were doing; before long, the napkin sketches came out. It was fascinating to me that I was having an exceptionally meaningful conversation about national security problems with a guy in a garage in

SEEKING FITNESS
Finding the right fit—matching government problems to tech company solutions—is BMNT Partners' stock in trade, "to provide responsive capabilities in a rapidly changing national security environment." It builds on what managing partner Peter Newell did as chief of the REF: matching military problems with largely military solutions and the lessons he learned about what worked and what didn't to get things done. (Image by erhui1979/iStock)

Silicon Valley. What I learned over the course of my visits there was that folks in Silicon Valley would respond to big problems. In fact, that was the currency that we actually traded in.

In the Valley, it wasn't so much that I was looking to spend money to buy tech that was valuable as it was that I had really good, hard problems that people loved to play with. Over time, Joe and I worked out a rhythm where I would send him a one-page document that had my top three or four issues on it. Joe would translate the government-speak into something that made sense in the Valley and use that to find the right people to talk to. I'd show up a month later and he'd have rooms packed full of people. Rather than waste my time talking to 1,000 people to get to the two I really needed, at Stanford, we'd knock that down to 40 and I'd get 10 of the right people from the group.

The time savings alone was huge, but more importantly the quality of dialogue we were having was even more improved. I couldn't get to Silicon Valley as often as I wanted to, because of the demands for other things. So REF hired Joe and another guy to actually be our scouts. Essentially, they did for REF then what DIUx is doing for [Secretary of Defense Carter] now.

Not long after that, we found ourselves doing close to $100 million worth of work on the West Coast, and we had a hard time getting our program managers out there to pay close attention to the more challenging programs—some call them high-risk programs. In our case, we called them highly fragile programs. These programs needed somebody's personal presence to give us early warning that something was amiss so we could take remedial action on them, or something was going very well that we could take advantage of.

I shared our problem on the West Coast with an office in D.C. that did similar work and asked them how they were doing it, only to find the No. 2 guy in the office actually lived on the West Coast. They managed an intro to Jackie Space, who turned out to be the ideal candidate for filling a PM role out there.

A few months later, I was at Stanford and let folks know that I planned to retire soon. Joe, being well-trained at influencing peoples' behaviors, grabbed me and said, "Listen, I don't know how it would work, I don't know what it would look like, but why don't you come out here? And we'll figure out how to do this, you know, facing the other way, by pulling government problems into the Valley and building coalitions of folks around them."

It took us almost three years to actually put the puzzle together and do what we first drafted on our own napkin sketch. We ended up forming a new company so that it was a fresh start for everybody.

I was driving across the country on my move to Palo Alto when serendipity struck twice. The first time happened as I was heading into Kansas City, Missouri, when some folks I had briefed on REF's operating model some six months earlier called me and said, "Will you stop in Kansas City? We want you to talk to the director of our facility [the National Secure Manufacturing Center (NSMC)]," which is a DOE [U.S. Department of Energy] facility that does all the classified manufacturing for the government.

Over coffee in a hotel restaurant, the director laid out their challenge, which was increasing pressure to become more responsive to the agencies that used them. But their workforce largely came out of the defense weapons program, which means they had program managers who were accustomed to doing 17-year programs, not seven-month programs. And they were really struggling to understand how they would apply innovation to their business model and how that would work. They asked me to describe what I was doing at REF, and I got halfway through that description, was literally coloring on a napkin in a restaurant. The guy stopped me and said, "We need you to do that for us."

I begged off long enough to finish moving, but I told them that I'd come back and reengage. We ended up spending two years working with the NSMC team before transitioning to a wider role supporting the DOE Advanced Manufacturing Office—something we still do today.

The second strike came two days later. I was cruising through the plains of Kansas when Jackie called me and basically said, "I'm not doing anything at REF." She asked if I had room for her on the new team we were building in the Valley—knowing full well this was a startup and we had no idea what the hell we're doing, and that we had no idea if it would make money and or be a flop. God love her, she was willing to take the plunge with us.

Those two events were fortuitous, because the DOE work provided us a platform to actually test out a lot of our concepts while pushing us in directions we had not considered before. It was challenging work that also helped us get the company started.

We eventually settled on a couple things. One was that we were valuable as what I would call a disinterested third-party ombudsman to everybody, which means we sat in the middle and translated DOD verbiage and behaviors for Silicon Valley, and at the same time we educated DOD folks on how Silicon Valley functioned. With that common framework, we found we were able to get them to negotiate their way to a common pathway toward deeper involvement together.

Army AL&T: What was the first year or so of BMNT Partners like?

Space: That first year was pretty chaotic. Early on, I felt like when we showed up in the Valley, we got sideways looks from everybody. I don't think anybody really understood what we were doing there from the startup community side, because we weren't raising money around the next one-hour delivery app. Even on the government side, people questioned why we were there.

Army AL&T: Did any of you have a tech background?

Space: I'm an engineer, but my tech background is in aerospace. Pete, I think, probably was the most well-versed out of all of us, because while at REF he touched so many different technologies and their applications. I think he had the best grasp of what was on the leading edge.

Army AL&T: But it's safe to say you were not a typical Silicon Valley startup.

Space: No, we were not at all and still aren't. All this preceded the launch of DIUx, so there wasn't anybody out there that was well-known, except for Palantir [Technologies], SRI International or PARC.

That first year was also challenging because our energy was spent trying to establish who we were and what we were doing while also learning about what made Silicon Valley really tick, and then how to get them to work on national security problems. We did lots of small jobs for about a year and a half, I think, before we really transitioned to this Hacking for Defense model. We found that it helped us to be that third-party agnostic voice in the room. So we transitioned to working more on the government side and sourcing problems into the tech community.

When I talked to companies, they sometimes would ask, "What do we get out of this if we show up for an hour in a Hacking

The minute a startup takes money from an investor, they are on a three- to five-year timeline to sell that company. And their focus is to get a product into the market as fast as they can. There is no wiggle room for them to divert assets to exploring side deals with the government.

PROBLEM, MEET SOLUTION
BMNT co-founder Peter Newell and Jackie Space, a partner in the company, confer during a Hacking for Defense class at Stanford University. The class, said Space, "is not necessarily geared toward startups." A solution could also come from a big company or academia, for example. "It's geared toward finding the best solution. Almost always, it's a combination of all of them working together." (Photo by Rod Searcey, Stanford News Service)

for Defense thing?" My response to them was that they were talking about how they all wanted to expand their portfolio in some way—to have more diversification—and that the government problems might provide a means to do so. Up to that point, the only mechanism they had was to basically canvass FedBizOpps and then send people to conferences and trade shows and try to get meetings with government people to try to have a conversation. None of which they were really interested in doing. Silicon Valley's business model just isn't tuned that way.

I've been on both sides of equation; responding to RFIs [requests for information] and RFPs [requests for proposals] takes a lot of time. For a fast-paced company, especially one in the startup stage, there's no way they could spend the time doing this.

Army AL&T: They could spend a day looking up acronyms.

Space: Oh, it's terrible. We spend a lot of time just translating that aspect of it. It's maddening for a company to get in one government place and get it all worked out, then have to start over again with every new organization they approach. No small company or tech company focused on building a commercial product will waste its assets doing this.

Newell: We came to understand most from our work with startups and investors: The minute a startup takes money from an investor, they are on a three- to five-year timeline to sell that company. And their focus is to get a product into the market as fast as they can. There is no wiggle room for them to divert assets to exploring side deals with the government. I've had this conversation more times than I'd like to count. At one point, the CEO of a startup looked at me and said, "Listen, I would love to do this. As an American, I would love to do this. But if I touch that thing, this company will have a new CEO here the next day. Because it has nothing to do with meeting the immediate objectives of the investors of this company."

That's the hard part. If government folks in programs aren't taught to figure out how to get in sync with potential early-stage companies sooner and with a better value proposition, they just won't get much from them. It's unfortunate, because instead of showing up with a solid market analysis of why the company should work on the government project, they simply show up and ask to look at what technology they have to fill the government requirement. Then they are surprised when they get, "Thanks for your interest, but we aren't going to have a $1,500-an-hour engineer write a white paper for you. No thanks."

Space: A caveat to what Pete was saying about startups: The talk about DIUx and the dialogue from D.C. tends to focus on "startups." The term startup applies to a wide range of companies: everything from the girl working out of a garage to a company that is fresh off a multimillion-dollar seed raise. There's a big difference among them, and even other small companies that are on solid footing but have never done business with the government before.

When I look at the problems that we're sourcing in Hacking for Defense, what I love about the model is that it's not targeted necessarily to startups. It can bring in any type of solution provider. It could

be a big company, it could be an academic, it could be somebody on the startup side. But it's not necessarily geared toward startups. It's geared toward finding the best solution. Almost always, it's a combination of all of them working together.

Army AL&T: It seems that what you do isn't so much about technology, but about problem-solving.

Newell: So much of it is really about the sociology of building teams around problems.

Space: From the culture side, the Defense Department is not used to having to reach across like that, or reach out from the acquisition side. They're used to having the vendors and people come in and pitch them all the time. So this has really been a new sort of cultural way of looking at the behavior of an organization and how they look at their problems.

Army AL&T: What kind of feedback have you gotten from DOD? Is there resistance?

It wasn't about building parts and things, although we did sometimes. It was about making sure we understood the problem and using that to help generate interest back in Washington, D.C., to actually solve it.

Newell: If you measure the reaction in terms of the workload, we have more work than we can possibly handle. I still think, though, that we are met with a little bit of—I would call it skepticism. You really have to educate people, and quite honestly it takes a lot of socialization inside some circles of the government to get them to understand how they'll be able to use this in the environment that the systems are currently built in.

Space: I've found so far that our initial engagements come from people who would be considered mavericks inside their own organizations. We'll start the conversation with them and over time help them educate others within their organization on how H4D can be used to help them.

People think, well, if you have a general sold or some secretary, then that will make a big difference. But it's really the middle layers that have to adopt and execute on this. That's who we spend the bulk of our time with.

We are getting good responses, I think, not just the hand-waving and gentle pats on the back, but real solid engagements followed by real solid problems to work on. Despite the results, I don't think it's our job necessarily to go out and try to convince everybody to do this.

Army AL&T: There has been some criticism of your approach, and for that matter DIUx's approach, and criticism from supporters of some of the big defense contractors, who say that what you're doing is all nice and well, but it's small potatoes and not going to make that much of a difference. How do you respond to that?

Newell: I call it shortsighted, but Jackie has a more worthwhile explanation.

Space: We've been maybe viewed as being competitive to defense contractors, which I think is silly. We know that the more work that gets done like this, the better off the programs will end up being when the government goes to write the requirements. I don't see how it's not going to help by understanding the requirement better from a technology perspective and from a user perspective.

The large defense programs—there is a place for that, when it comes to building ships, tanks and fighter jets. But when you're looking at all of the R&D [research and development] that's feeding into those programs and all the prototypes that are being built that don't have a direct alignment to a customer and aren't in line with … the leading edge, I think that's a problem.

Newell: I'll look at it from a warfighter's perspective. The way the world is today, it doesn't matter how good your kit is the day you show up for a war. What does matter is how quickly you change once the bullets start flying. People are finding ways to circumvent our best technology more rapidly than we can actually get it out on the battlefield. So offset in the future is really about speed, not about any one technology.

I've had a little bit of pushback from some of the bigger guys, and some others who said, "You know what? You're right. We have to figure out how to behave better in this arena, and we need to figure out how we're going to become part of that ecosystem." Today we work with some very large corporate clients who are hell-bent on figuring out how to do this. The us-versus-them thing between defense firms and startups is nice fodder for news articles, but it's not based on reality. Wasted energy, I think. ?

DEPLOYING THE LEAN STARTUP METHOD

The Lean Startup is a movement launched by Steve Blank, a serial entrepreneur in Silicon Valley. His Lean LaunchPad has changed how startups are built, how entrepreneurship is taught and how science is commercialized; and it's changing how large corporations and the government innovate. Blank wrote "The Four Steps to the Epiphany" and co-authored "The Startup Owner's Manual" with Bob Dorf. He teaches at Stanford University; the University of California, Berkeley; Columbia University; and New York University. In 2011, he developed the National Science Foundation (NSF) Innovation Corps—known as I-Corps and considered the standard for science commercialization in the U.S.—and later he brought the I-Corps to the National Institutes of Health (NIH).

Along with Peter Newell and Joe Felter of BMNT, Blank has developed and taught a Hacking for Defense class at Stanford that will spread to more than a dozen other universities nationwide in 2017. He launched its sister class, Hacking for Diplomacy, at Stanford in fall 2016.

After a stint in the Vietnam-era Air Force repairing fighter jets in Thailand, Blank ended up in Silicon Valley, where he started or worked on eight startups in 21 years. After retiring in 1999, "I had some time to think about it and realized—heretically, at the time—that we were just missing something really big," he said in an October interview with Army AL&T.

A typical Silicon Valley startup at the time, he said, was treated pretty much as a small version of a large, established company. You wrote a business plan, raised capital from investors, hired a team, introduced a product and then started selling it. "And most of the time you'd fail, but that was the methodology, because large companies wrote plans and raised money and whatever, and they succeeded," Blank said. "So, most of the time when you failed, you blamed it on the founder, the VP of sales or something else."

What was missing, Blank realized, was the understanding that startups had almost nothing in common with large, successful companies. Large companies know their customers, their competitors, their products and their pricing. Startups go into business knowing none of that. "We needed very different tools to manage chaos and uncertainty, versus what you have in a known organization, which is certainty."

None of the conventional ideas of how to run a business dovetailed with startups, Blank said.

"For 100 years, business schools have been teaching, not wrongly for existing companies, how to manage supply chains, how to write income statements, balance sheets and cash flow, what you use to manage profits and companies, how to hire, how to do everything … but they were all assuming you had an existing company," he said. "There wasn't even a class or a language to describe, well, what if you're operating in a series of unknowns rather than a series of knowns? There wasn't even a word to describe that."

It's comparable, Blank said, to the Cold War as opposed to the current war against Islamist extremists.

"When we were facing off against the Soviet Union, that was a series of knowns. In Europe, you could most likely know where their tanks were going to come through, we knew their weapons. The equivalent is dealing with ISIS [the Islamic State group]. Here's a threat that's changing hourly. Because they learn rapidly, they train in cyberspace, they buy on eBay, they use Telegram and Messenger, they pay with PayPal, etc. That's a very different threat. It's a chaotic and agile threat versus the ones we were facing during the Cold War."

As Blank started working on his theory of how startups should proceed, he developed three components. "One is understanding that anything decided on Day One won't survive first contact with customers. And therefore what you really have is a series of untested hypotheses. No facts. So how do we organize those hypotheses?"

Step One: Articulate your hypotheses. Blank borrowed the Business Model Canvas, a concept from Alexander Osterwalder, a Swiss business theorist, author and consultant. On a single sheet of paper, you develop your hypotheses: What's the problem? Who's your customer? How will you deploy your team? What's the distribution channel? What's your solution? "Write down your hypotheses. And write them down in a framework that's repeatable and sharable with other people," Blank said. "Here's what we think the problem and solution look like."

SELLING THE LEAN STARTUP

Steve Blank speaks at Startup Istanbul in October 2015. The event's organizers describe it as "a gathering of the leading startups, internet companies, business angels and venture capitalists from Asia and Europe." (Photo by Alison Elliott)

BLANK CANVAS
Blank set out to develop a way to launch a startup knowing little to nothing about the customer or competitors, their products and their pricing—a typical situation versus that of a large company. He came up with a method "to manage chaos and uncertainty," using three basic principles. (SOURCE: Steve Blank)

Step Two: Get out of the building. "There are no facts inside your building, so get the hell outside," Blank said of the customer development process he created. This involves talking to at least 100 potential customers and stakeholders about your hypotheses. In his Hacking for Defense class at Stanford, Blank requires students to talk to 100 to 150 people about defining the problem, possible solutions and iterations of possible solutions. "You're not just asking them what they need and want."

Step Three: Build a minimum viable product (MVP). This isn't a prototype, but "it's an incremental and iterative test of 'Do I understand what this problem is and what a potential solution could look like?' … On Week One, it might be a PowerPoint slide or an Excel spreadsheet, then it might be a wireframe or a cardboard mock-up or some non-working mechanical, and eventually it becomes something that looks like the finished product."

Finally, prepare to follow an often-repeated Silicon Valley maxim: "Fail fast, fail often." This means repeating the lean process over and over again, refining and revising the MVP based on customer feedback—iteration—and possibly even overhauling your definition of the problem—pivoting.

CONCLUSION

"This methodology has been adopted by every startup in Silicon Valley in the last 10 years," Blank said. And it has spread to NSF, NIH and other federal research agencies, as well as some intelligence agencies. Corporations large and small are also adopting it. Blank's cover story ("a hell-freezes-over moment," he noted) in the May 2013 Harvard Business Review, "Why the Lean Start-Up Changes Everything," defined the lean startup movement to the corporate world outside Silicon Valley.

"In the 21st century, the rules are different than they were in the 20th century," Blank said. "In the 20th century, a corporation's average life cycle, from start until typically when they went out of business, was 60 years. In the 21st century already, the average corporation survives for 15 years. What happened? It's not that companies have gotten stupider, it's that the world has changed. All the rules you learned in the 20th century as a corporate executive are just obsolete. Why? Well, the obvious ones in the business world: China as a manufacturer. China as a customer. The internet lets pricing and branding change radically. You can know price in any part of the world, and you can create a brand in a week. … If you're a large company CEO and you had skills only focused on execution, that worked when Jack Welch was CEO of GE [between 1981 and 2001], but it doesn't work anymore in the 21st century."

For more information, go to ***www.steveblank.com****.*

—MR. MICHAEL BOLD

ASSEMBLY ON THE DROP ZONE

Spc. Clayton Weldon with the 1st Battalion, 143rd Airborne Infantry Regiment, Texas Army National Guard looks for his squad at the rally point during the Golden Coyote training exercise at Camp Guernsey, Wyoming, in June 2015. Steerable parachutes were supposed to make it easier for paratroopers to reassemble into units after a jump. (U.S. Army photo by Spc. Tamara Cummings)

RULE NO. 1

The first principle of any defense acquisition must be the welfare of the warfighter, more than the program's future, although it isn't always so.

by John T. Dillard, Col., USA (Ret.)

"Primum non nocere." — Hippocrates, fifth century B.C.

In any military or civilian career of any significant time span, one will have the misfortune to work for at least one world-class jerk. I had one, and he was that for me and many others. His actions personified for me the reason for Hippocrates' oft-quoted principle of medical care—in English, "First, do no harm." In the early 1980s, he commanded the brigade in the 82nd Airborne Division that had proponency for all things tactical and operational about the 82nd's parachute operations. Its two other brigades were assigned proponency for heliborne and dispersed anti-armor operations.

Just before my arrival at the 82nd's home at Fort Bragg, North Carolina, in 1979, the division had begun issuing and using a new "steerable" parachute, the MC1-1. This was a modified T-10 parachute, with a large U-shaped hole in back, which enabled a trooper who knew what he was doing to turn the chute in midair and do a moderate amount of maneuvering while descending. The air escaping from the back of the chute did at least two other things: It slightly reduced the buoyancy of the chute, and it built in a forward speed of about 8 knots. The idea for this technical innovation was to provide for midair assembly, a new capability for the airborne community.

Assembly on the drop zone had been a major challenge for airborne forces since World War II. Even if not hampered by anti-aircraft fire from enemy or friendly forces, poor navigation by pilots and jumpmasters, or the disorienting noise and blast of the wind while exiting the airplane, paratroopers were still widely dispersed over an area of ground—as much as could be covered by an aircraft doing 100 knots or so over a period of 30 seconds and more. All that and the chaos of battle (or even peacetime training) amounted to individual troopers having a tough time linking up with

their squads, platoons and companies in a battalion-sized drop.

A SOLUTION WITH MAJOR PROBLEMS

Earlier in the decade, some geniuses envisioned that highly trained paratroopers with steerable chutes could maneuver in the air as they descended to earth and move closer to previously designated assembly areas, perhaps marked by Pathfinders or other early-arriving troop leaders. If you're already imagining some things wrong with this tactical concept, try adding the fact that in actual combat (and usually in training as well), the preferred mode of airborne forced entry into enemy territory is during the hours of darkness, and from an altitude of only 500 feet.

This doesn't give the trooper adequate visibility of the terrain, or the time to do much maneuvering before hitting the ground. The Soldier is usually busy untwisting the parachute harness "risers" and lowering heavy equipment (rucksack and weapon containers) in the few seconds before conducting a controlled fall onto what the Soldier hopes is something other than trees, water or asphalt. The Soldier is really lucky to be able just to face the chute into the wind, having to guess which way it is blowing, to avoid crashing into the ground at 8 knots—plus whatever the wind speed is at ground level.

Well, we assembled in midair with this new parachute all right, but not the way the geniuses had planned. An additional and completely unintended aspect of the MC1-1 that came to light during initial employment was that the chute did something strange as it was coming out of its deployment bag underneath the aircraft. When two troopers exited the airplane at the same time from the opposing rear doors, the chutes tended to come together and even rub against each other as they were opening. Sometimes they would intertwine and cause catastrophe—one or both jumpers would lose all lift and fall free when the nylon chute began melting from friction, or hang helplessly entangled below the upper jumper. It happened even when troopers, propelled by the built-in forward speed of the canopy, collided at lower altitudes. The 82nd lost seven troopers to high- or low-altitude entanglements in the months leading up to my arrival.

In the brigade headquarters, I remember occupying the office desk of a sergeant first class who had died from such an accident a week or so earlier. He was an experienced jumper, which gave me pause: What in the world were we doing with this new piece of gear? Soon we were incorporating workarounds such as alternating the exits of individual jumpers out of each opposing aircraft door, using chemical light sticks inside the aircraft, pointed at the jumper, as a visual signal to go out the door. This slowed down the exits and required multiple passes over the drop zone to get all the paratroopers out safely—a real pain in peacetime, and definitely not feasible for actual combat operations.

We were also having ground crews light big smoke pots on the drop zone so we could perhaps see (on a moonlit night, maybe) which way the wind was blowing. (We joked about who might perform this nice service for us in combat.) We intensified the training and pre-jump briefings on how to steer, avoid collisions with each other and land with the chute.

STICKING THE LANDING

The MC1-1, which featured a U-shaped hole intended to allow Soldiers to maneuver in midair, was hailed as the biggest milestone in decades for airborne operations. Excitement over the long-expected innovation pushed the program forward despite the problems shown in operational testing: The chutes tended to get tangled up, leaving one trooper dangling from a fellow trooper's chute in one of the less disastrous outcomes. (U.S. Army photo)

Orthopedic injuries were way up, and more Soldiers died—all because we were trying to accommodate the biggest technological innovation that the airborne community had seen in the past 35 years. It was insane. As much as we all wanted to embrace the new snazzy gear, it was literally killing us.

'SOLDIERING ON'

Over the course of 1979 and 1980, we did our best to just "Soldier on" and adapt to it. Then one spring day, the brigade commander assembled all of the brigade's jumpmasters into Towle Stadium on Fort Bragg. The stadium was named for Pvt. John R. Towle, who received the Medal of Honor posthumously for his valiant actions during Operation Market Garden in Holland on Sept. 21, 1944. Towle was a trooper from the 504th Parachute Infantry Regiment who single-handedly went up against German armored vehicles with his bazooka, constantly exposed to enemy small arms fire, and killed at least nine enemy soldiers before being mortally wounded by a mortar round.

By the time of our assembly, I was a rifle company commander in the 2nd Battalion of the 504th. We all knew the story of Towle's bravery, and the stadium had special significance for us. I looked around at the several hundred of us officers and noncommissioned officers who were jumpmaster-qualified from the brigade's three battalions and headquarters company. We didn't know why we were assembled or what the brigade commander was going to say to us. Then he held up an MC1-1.

We were mighty shocked and insulted when he said, "Anybody here who is afraid of this parachute, raise your hand. Raise your hand, and I will see to it that you never jump one of these again. I will personally issue you a T-10 to jump with instead." No one raised his hand, though many of us probably wanted to. Seeing us all acquiesce, he went on, "The Army has invested millions of dollars in this parachute, and we're going to jump with it." That was about it for that little meeting. I saw bewildered heads shake and eyes roll. "What in the hell are we doing?" I thought.

GETTING AROUND IT

As the next year went by, while using all the workarounds described above to try to prevent more accidents, we somehow slowly began to abandon the use of the chute—first for "mass tactical" jumps of many aircraft loads, then whenever we jumped full aircraft loads at night, and so forth. I don't know the backstory, but there had to be one. Perhaps our division commander, Maj. Gen. Guy S. Meloy III, who was a real Soldier's Soldier, had something to do with our backing off the use of this chute in tactical operations.

DOES THIS PARACHUTE MAKE ME LOOK SCARED?

Programmatic inertia and failures at all levels of the acquisition system led to 82nd Airborne paratroopers being ordered to jump with a flawed chute that had killed at least seven Soldiers. One trooper later joined the acquisition system that in this case had failed so catastrophically, to try to prevent it from happening again. (Image by U.S. Army Acquisition Support Center)

In any case, by the time I had served three years in that wonderful division, we had almost gone full circle. But I never forgot what it felt like to be on the receiving end of "new" equipment that didn't work properly, or was insufficiently tested, or was politically promoted, or whatever led up to the misfortune of that parachute debacle. There was no excuse for it. It was a leadership failure.

CONCLUSION

We later learned that the Airborne Test Board had tried its best to stop the fielding of the chute when its members observed and filmed the entanglement phenomena during development and

NIGHT FLIGHT

U.S. Army paratroopers from 173rd Brigade Support Battalion conduct a night airborne operation with a C-130 Hercules from the U.S. Air Force 86th Airlift Wing, in Pordenone, Italy, in February 2015. The midair maneuvering that the MC1-1 aimed for was a strange goal to pursue: In combat, most jumps happen under cover of darkness and too close to the ground for Soldiers to have time to steer. (U.S. Army photo by Visual Information Specialist Massimo Bovo, Training Support Activity Europe)

operational testing. But the thing had its own momentum by then. As in the failed Operation Market Garden, which is often attributed to "momentum" and groupthink, everyone was swept up in the notion of something new for the paratroopers. No one along the way had the guts to stand up and say, "This is wrong."

The brigade commander could have done it. He was at the end of his career. But I have to suppose he was trying to get promoted to brigadier general. He was definitely trying to "manage up" and please those above him.

I could have done it myself that day in Towle Stadium, but it likely would have had only the effect of my own embarrassment, since I was at the end of a long line of events that delivered the parachute to me and my troopers. I guess that's why I resent this experience so much—because people got hurt and it made a sort of accomplice out of me. I was only mildly uncomfortable jumping the chute tactically and became a master parachutist by the end of my tour. But I didn't stand up for my men that day and tell the CO where he could put that parachute. The acquisition system had let us all down, and I swore to myself I'd do my best to prevent such from happening again if I ever could.

The only way I figured I could do that was to infiltrate the ranks of the "acquisition weenies" who were giving us this kind of crap: the scientists and engineers and testers and logisticians and bureaucrats who ran or oversaw this process that could allow people to be hurt by the very thing that was supposed to help them.

Unfortunately, the parachute tale isn't that unique—it was just personal. Go all the way back to the Vietnam-era saga of the M16 rifle's multiple malfunctions if you want another horror story of a technical glitch costing friendly lives. Programs seem to have a life of their own sometimes, a very real momentum. We've been getting better at killing programs lately, at various stages of their lives—usually fairly late—some deservedly, some maybe not. Usually the decision to cancel stems from money constraints or requirements waning, and thus ignores sunk costs.

The parachute experience was irony. It sucked. Because Rule No. 1 for anybody in the acquisition business should be, just like ol' Hippocrates said to all future generations of medical students, "First, do no harm." Yeah, that's right: Don't kill the customer.

JOHN T. DILLARD, COL., USA (RET.), is the academic associate for systems acquisition management at the Graduate School of Business and Public Policy, Naval Postgraduate School (NPS) in Monterey, California. He began his Army service as a Ranger-qualified infantryman and master parachutist, serving in the 1st Infantry and 82nd Airborne divisions, and joined the NPS faculty in 2001 upon retiring from the Army after 26 years of service. He spent 16 of those years in acquisition, most recently as commander of the Defense Contract Management Agency, Long Island, New York. He has also served on the faculty of the U.S. Army War College and as an adjunct professor of project management for the University of California, Santa Cruz. He holds an M.S. in systems management from the University of Southern California and is a distinguished military graduate of the University of Tennessee at Chattanooga with a B.A. in biological sciences.

DREAMING of a STRATEGY

Outgoing DASA(P) looks ahead to new possibilities for streamlining acquisition as a new congressionally created panel embarks on a sweeping review.

by Mr. Harry P. Hallock

A few months ago, I received a phone call asking me to participate on a panel with 17 other current and former colleagues charged with reforming the DOD acquisition system. In Section 809 of the National Defense Authorization Act (NDAA) for Fiscal Year 2016, Congress created the panel to advise DOD how to streamline the acquisition process, in an effort to maintain an advantage in defense technology.

My initial thought was, "Here we go again! More acquisition reform, only to stay the same." But as I integrated onto the team and learned more about this initiative, I discovered that Congress had allowed the panel tremendous latitude to improve the acquisition process. Congress has given the Advisory Panel on Streamlining and Codifying Acquisition Regulations two years to review DOD acquisition regulations and policies, identifying those that are working well and could be worth expanding, and those that are unnecessary and should be eliminated. Specifically, Congress asked the panel to examine the buyer-seller relationship, improve the functioning of the acquisition system, ensure the continuing financial and ethical integrity of defense procurement programs and protect the best interests of DOD.

I also thought back to the last time Congress took this much interest in reforming acquisition, in 1991, when it established the Section 800 Panel, whose efforts resulted in procurement reforms introduced primarily through the Federal Acquisition Streamlining Act of 1994 and the Federal Acquisition Reform Act of 1996. This caused me to reflect on my participation as truly an honor and a real opportunity to introduce one of my favorite concepts into the acquisition process.

OPEN FOR DISCUSSION

Hallock addresses attendees at the Services Acquisition Roadshow held at U.S. Army Materiel Command (AMC) headquarters at Redstone Arsenal, Alabama, in May 2016. Hallock designed the event to give acquisition professionals the opportunity to hear from DA representatives and speak candidly about the acquisition process—"a way to pull the curtain away from the nebulous DASA(P) and help [acquisition professionals] do their jobs better." (Photo by Doug Brewster, AMC)

In 2013, as the deputy assistant secretary of the Army for procurement (DASA(P)), I was asked to join a group of "visionary" acquisition leaders across government, industry and academia to discuss the future of acquisition. I did, and we spent more than a year launching a federal-wide concept that involved developing a common vision and a usable framework with steps for guiding strategy, providing a road map and organizing data—all to inform investment decisions, measure progress and provide transparency with an eye toward an improved future for government acquisition.

This grass-roots movement is called Acquisition of the Future (AOF). Its participants believe acquisition is the most powerful and underused lever in the federal government for finding efficiencies and driving results. We have tried to think beyond the existing state of federal acquisition and consider what could be possible in an ideal state. In other words, the AOF movement is "daring to dream."

AOF and the 809 Panel, as it is commonly known, share a common set of goals that include making acquisition more efficient and effective by looking at the future through the lenses of all stakeholders and breaking down barriers that impede progress. I consider potential Section 809 policy changes as a practical application of AOF transformational thinking. And what better legacy can any of us leave for Army acquisition than a living vision for a better way of doing business?

While the 809 Panel is just getting started, three principal ideas that I and others have been promoting are a focus on outcomes, streamlining processes and overcoming workforce challenges.

FOCUS ON OUTCOMES

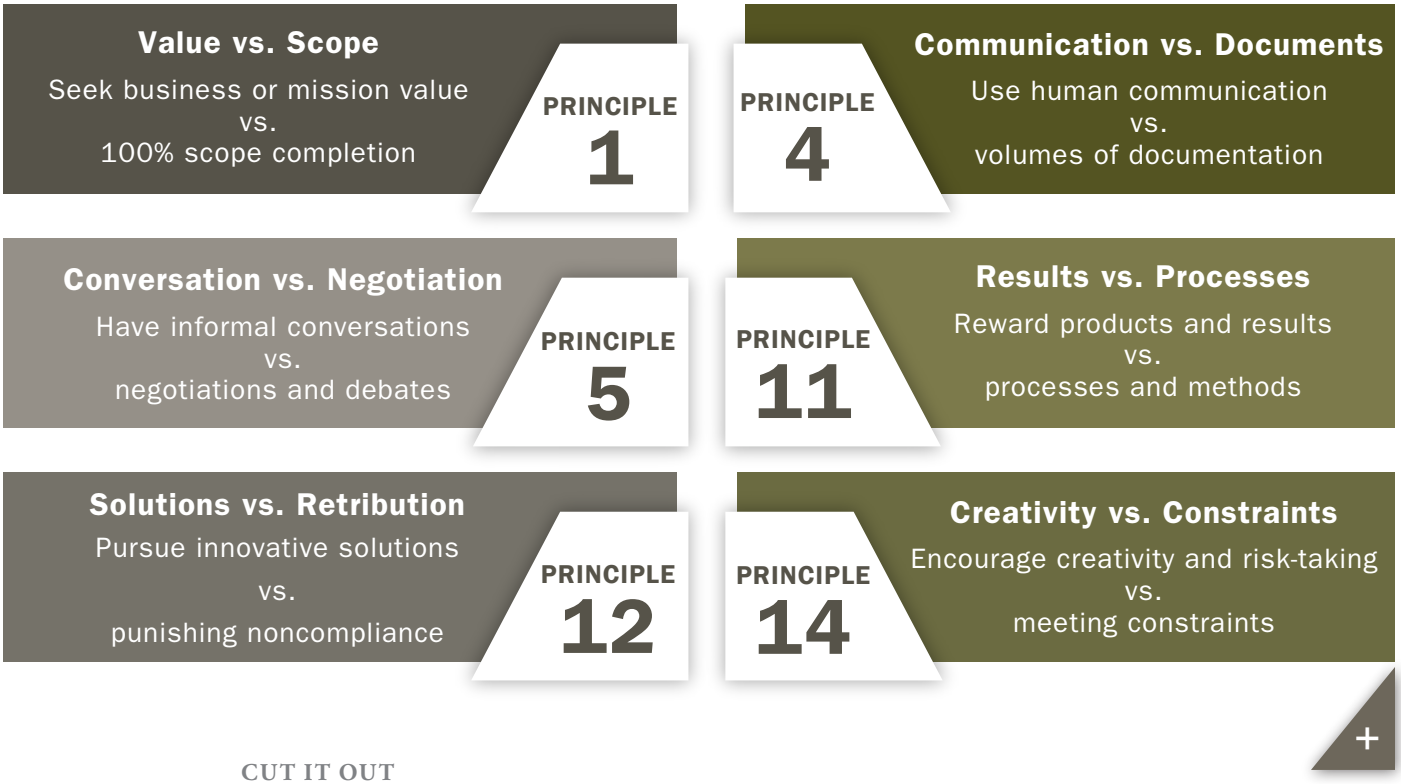
Congress has told us in recent legislation that it wants DOD to have an agile acquisition process that provides the warfighter with the best capabilities possible. Agile contracting is a concept the department has been slow to adopt, however, probably because it would require us to create an entirely new contracting model—scary stuff in a bureaucracy as big and complex as the DOD acquisition system, with its many stakeholders. Having said this, one idea that the 809 Panel is considering involves the government and contractors forming a partnership, a term of art that largely fell out of favor a few years back, to converse informally and share ideas about a better, more inclusive way of generating requirements. We would focus on the entire acquisition team, which includes contractors, and on outcomes, even at the expense of strict adherence to process.

Adopting such an approach would require stakeholders to collaborate early in the planning stages of an acquisition as requirements are being developed and put in a format that can be put out for bid. Program executive offices and requiring activities would have to engage with industry via one-on-one and multiple vendor collaborations early enough in the process to submit well-thought-out requirement packages. (See "Recalibrating Requirements," Page 26.) That, in turn, would allow sufficient time for the iterative process needed for successful, agile contracting while realizing the need to look at organizational conflict-of-interest issues associated with this type of early collaboration.

In my more cynical moments, I have been known to opine on Army leadership treating the contracting process as a "necessary evil" that requiring activities must tolerate to get a product or service to the Soldier. In reality, when requirements are well-planned and executed, contracting

FIGURE 1

Agile vs. Traditional Contract Principles



CUT IT OUT

The transition from the traditional process to a more agile one has been slow to take shape in part because it would require an entirely new contracting model that emphasizes outcome over compliance, Hallock noted. An agile process—characterized, in DOD's case, by these six of 16 principles of agile operations—requires acquisition leaders at all levels to create an environment that rewards those willing to take risks in the right circumstances and for the right reasons. (SOURCE: DavidFrico.com)

can truly be agile, a force multiplier and, in contingency operations, a critical enabling function.

Today, many of those who generate requirement packages regularly send poorly written requirements to contracting offices with a "just get it on contract" mentality. This often results from the acquisition team not placing enough emphasis on the pre-award process (acquisition planning). In many cases the contracting officer, the government's face to industry, takes the blame for mistakes or problems that could have been avoided with proper up-front collaboration.

On the other end of contract execution, the acquisition team is often remiss in not placing the proper emphasis on the post-award process (contract administration). When contract surveillance is successful, the customer knows what it is getting because it is helping the contracting officer monitor contract output, and the contracting officer is aware of contractor concerns that may impact performance. Thus the contractor and the government each does its part to complete the contract as agreed.

In creating a vision for the future, it is likely that the government and industry must abandon our current approach, which lacks this kind of collaborative environment in contract management and oversight, instead favoring an acquisition process that includes a timeline of acquisition events in the planning phase and an outcome-based strategy during contract administration. (See Figure 1.)

STREAMLINING PROCESSES

In addition to emphasizing outcome over simple compliance, the DOD acquisition system must evolve to excise from the rule book burdensome activities with little value. One way to streamline the process would be to consolidate acquisition dollar thresholds incorporated in DOD regulatory guidance. The procurement regulations have multiple thresholds, with various rules for application depending on the commodity or service, whether it is commercially available or a noncommercial item; the delivery and performance locations (within or outside the continental United States); and whether it should be set aside for our congressionally mandated socioeconomic programs. It is possible to consolidate many of these thresholds to establish a set of rules that apply regardless of the requirement, place of performance or delivery location.

As a member of the 809 Panel and a career contract specialist, I, along with my DOD compatriots on the panel, plan to explore ways to clarify existing policy on a number of topics, such as contract type, determination of commercial items and competition rules to ensure that they are necessary and, if so, are clear and straightforward. Current guidance to contracting officers is well-intended but can be complicated and confusing because of the evolutionary nature of the rulemaking process, which has a tendency to endlessly add, and rarely remove, statutory and policy guidance. Compounding this is agency-level guidance that supplements higher-level policy.

In creating a vision for the future, it is likely that the government and industry must abandon our current approach, which lacks this kind of collaborative environment in contract management and oversight.

The process could be significantly more effective if contracting officers and others involved had to follow a single regulation that was less prescriptive than the existing rule book and had limited supplementation. Clear, easy-to-follow regulations would reduce administrative burdens, improve compliance and make it easier for the various players to work toward a common goal.

It is important to note that, as a department, we focus a lot of our attention on policies related to weapon system development; however, in FY15 the Army spent nearly 62 percent of its contract obligations on services, and in FY16 over 61 percent. Given the preponderance of contracting for services, I expect the 809 Panel will focus some of its efforts on reviewing DOD acquisition regulations that apply to services. Although DOD's Better Buying Power initiatives focus on strategic management of services acquisition, some Army reporting requirements related to contracting for services are extremely burdensome, such as the accounting of contractor services and requests for services contract approval. Automating these manual processes would benefit both government and industry.

WORKFORCE CHALLENGES

Finally, should the 809 Panel introduce a significantly streamlined or entirely new acquisition process, commonly known as the "nuclear option," it must ensure that DOD has a fully trained and empowered workforce to implement it properly. That is because, if codified as envisioned, streamlined processes would not require the same level of oversight as current processes. Our contracting workforce, in turn, would need to acquire a certain level of expertise sooner than required today to take advantage of the flexibility of simplification and justify the reduction in oversight. To be effective managers of a newly simplified process, acquisition professionals must be adequately trained, both formally and on the job, to think critically, and they must have the authority to make decisions at the lowest possible level.

In this vein, the panel has tremendous freedom to review and make recommendations on deleting or revising department regulations. It likely will focus on revising regulations where necessary to make them less prescriptive and

FORMING NEW ALLIANCES
Lisha Adams, executive deputy to AMC's commanding general (CG), and John Lyle, deputy to the CG of the U.S. Army Contracting Command (ACC), field questions during an October 2016 forum on contracting and acquisition. Lyle moderated the panel, which also included representatives from industry and other federal organizations. Hallock and the other members of the 809 Panel recommend forming partnerships among these groups to share ideas about a better way of generating requirements, with a focus on outcomes over process. (Photo by Giselle Lyons, ACC)

require less internal oversight. Sounds simple, but to make such changes effective, acquisition leaders at all levels must create a culture that pushes back against the risk avoidance that our current workforce seems to embrace. That mindset stifles the creativity and innovation that Congress has asked us to accomplish, notwithstanding lawmakers' complicity in the status quo. Instead, we need to encourage our younger, less experienced workforce to assume planned risk and ensure the flexibility necessary for truly agile, innovative contracting to take root.

This means we must allow our less experienced practitioners to make honest mistakes without fear of reprisal. As the Irish playwright, novelist and poet Oscar Wilde said, "Experience is simply the name we give our mistakes." Allowing members of our workforce to make missteps and learn from them is the only way to grow a workforce prepared to become our future leaders.

Therefore, we must create an environment that encourages calculated and educated mistakes and actually rewards those willing to take such risks in the right circumstances and for the right reasons. Thus, mistakes become "teaching moments," opportunities to gain valuable insights into what went wrong and how the outcome could have been different. For leaders to participate constructively in this process, they, in turn, must do better at coaching and mentoring. A cultural change is very difficult to put into practice if the organization does not conscientiously focus on this critical aspect of leadership.

In addition, we can mitigate the likelihood of recurring mistakes and even avoid others by sharing lessons learned. Databases of lessons learned appear to have limited success, in that they capture and categorize lessons, yet are cumbersome to access for specific situations that arise in day-to-day business. However, on-the-job training, mentoring and interactive online forums can be very useful by enabling instant interactions and active sharing of knowledge and experience, which is how today's youth learn in this instant communication and information age. However we choose to make this happen, interaction and positive reinforcement at all levels are among the best ways to create a learning environment that will benefit individuals and foster organizational agility and innovation.

CONCLUSION

I must admit, the Section 809 Panel has its work cut out for it. With a wide-open mandate from the House and Senate defense oversight committees to assume no parameters and "to think way outside the box," as one congressional staffer put it, there is virtually no avenue we are prevented from pursuing in the realm of DOD acquisition.

Although an exhilarating prospect, such a large-scale endeavor will require discipline and focus to yield a result that deals effectively with the immense scale and complexity of the DOD acquisition process and provides palatable solutions to the department, Congress and the American people, who are demanding such large-scale reform. Regardless of what the panel ultimately decides, my goal as a member is to work with my fellow 809 Panel members to reform the

BUILDING A FORCE MULTIPLIER

The 408th Contracting Support Brigade at Camp Arifjan, Kuwait, conducts a briefing during enhanced contracting officer's representative training in August 2016. The training concept was conceived during the U.S. Army Central Operational Contract Support Summit in April 2016 and has remained a top priority for Maj. Gen. William B. Hickman, the U.S. Army Central deputy commanding general for operations. According to Hallock, when requirements are well-planned and executed, contracting can be a force multiplier and a critical enabling function in contingency operations. (Photo by ACC Public Affairs)

acquisition process by transforming our thinking and adopting a 21st-century approach to acquiring our nation's defense needs.

I believe we can get there by focusing on outcomes, eliminating unnecessary processes and encouraging risk-taking and innovation. I choose to dare to dream! Do you?

For more information on the Advisory Panel on Streamlining and Codifying Acquisition Regulations, go to ***http://www.dau.mil/sec809/default.aspx****.*

MR. HARRY P. HALLOCK was appointed the DASA(P) on July 14, 2013. Until he retired in January 2017 after 37 years of service to the U.S. Army, as DASA(P) he managed the development and dissemination of policies, processes and contracting business systems; directed the evaluation, measurement and continuous improvement actions for more than 270 Army contracting offices worldwide, which executed contracts for major weapon systems, base logistics support, construction and wartime operational contracting in Iraq and Afghanistan; and ensured the execution of federal, DOD and Army regulations for acquisition, procurement and related business practices. As the functional career representative for contracting, he oversaw the recruitment, training, certification and professional development of the Army's contracting workforce. A member of the Senior Executive Service since 2007, he holds an M.S. in program management from the Naval Postgraduate School and a B.S. in business administration from the University of Delaware. He also completed the Army Senior Executive Education Course at the University of North Carolina, the Senior Executive Education Program Intermediate Course at the University of Notre Dame and the Federal Executive Institute's Army Senior Leadership Development Program. He was Level III certified in life cycle logistics, program management and contracting, and Level II certified in test and evaluation engineering, and was a member of the Army Acquisition Corps.

BEEN THERE, DONE THAT

Does DOD set PMs up for failure with impossibly complex mega-programs built on immature technology? After a career in uniform supporting Army acquisition followed by a second career teaching acquisition, a former PM takes a final pulse check and outlines four best practices for keeping programs big and small on track.

(The fourth in a series of commentaries by former program managers on the faculty of the Naval Postgraduate School)

by Michael W. Boudreau, Col., USA (Ret.)

I am recently retired from government service, after 28 years in the Army and then 20 years of teaching at the Naval Postgraduate School (NPS). I have been fortunate to see acquisition from the perspectives of a military user, a maintainer of Army equipment, a builder of M1 Abrams tanks, a staff officer in the Pentagon, a project manager (PM) and a teacher of acquisition management.

It comes as no surprise to this audience that defense acquisition is multifaceted, requiring intensive management and involving three systems: the Joint Capabilities Integration and Development System, which establishes requirements; the Planning, Programming, Budget and Execution process, which provides the funding; and the Defense Acquisition System, which executes the acquisition. Unfortunately, these three systems do not interoperate seamlessly. As if this were not enough of a challenge, the Office of the Secretary of Defense (OSD) and Congress frequently change the rules by which acquisition must be accomplished, as described by John T. Dillard of the NPS faculty in his 2003 paper, "Centralized Control of Defense Acquisition Programs: A Comparative Review of the Framework from 1987 – 2003."

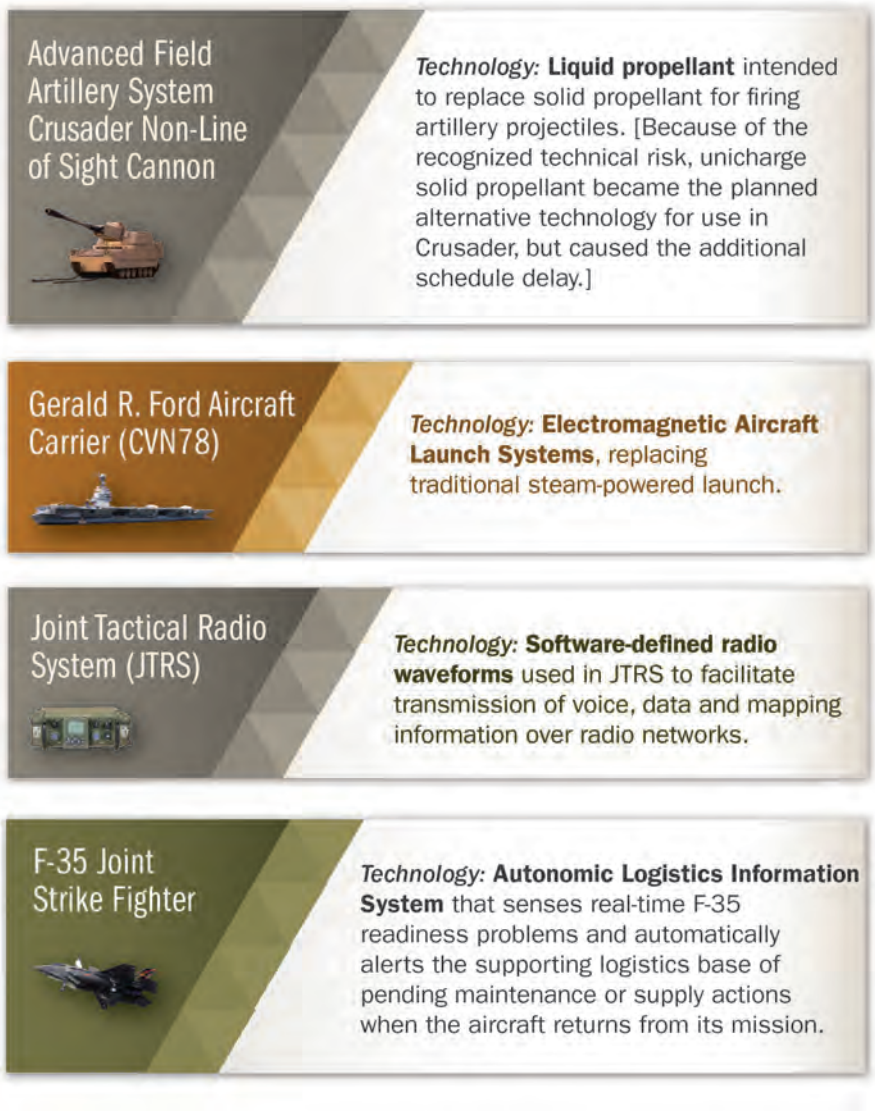
There is a longstanding and continuing trend of acquisition programs failing to achieve acquisition program baseline (APB) goals; that is to say, program managers often fail to meet important cost, schedule and performance aspects of the plans they agreed on with their superiors. The Government Accountability Office (GAO), formerly the General Accounting Office, has documented this trend thoroughly in multiple reports.

Given that defense acquisition is and will remain multifaceted, imperfect and evolving, must its future be completely and irremediably bleak? I suppose the answer to this question depends on whom you ask. Our government watchdog organizations, particularly GAO, can point to many examples of management mistakes. If you look at the three metrics of every program—cost, schedule and performance—you will see that over several decades, many acquisition programs have missed or will miss achieving APB goals in one or all three of these metrics.

Put another way, lots of defense programs cost more than they should, arrive late or don't do what they're supposed to. GAO detailed this situation in its 2015 and 2016 annual reports "Defense Acquisitions: Assessments of Selected Weapon Programs," which rate specific programs on the attainment of "product knowledge" and describe program status in terms of cost, schedule, performance and risk.

Sometimes PMs sign up for cost or schedule goals that are unachievable; in October 2015, GAO characterized this as a systemic problem in which the acquisition process is "in equilibrium," meaning that new programs are initiated with slender chances of completion on schedule and within cost. In many programs, technologies have not been ready to support mature, production-ready systems, leading to schedule concurrency—for example, simultaneously redesigning, retesting and manufacturing—which often brings delays, cost increases and then more delays. It is easy to paint a dismal picture of defense acquisition.

FIGURE 1



THE TIME WASN'T RIGHT

One key lesson learned from big programs that have run into difficulty: Major technology development needs to happen before any system designed around it goes into production. These four programs were hampered by still-developing technologies that were nevertheless built into the program's design; when those technologies did not pan out as expected, the programs suffered. (SOURCE: Michael W. Boudreau, Col., USA (Ret.))

THE BLEAK

From my perspective, the elephant in the room is DOD's propensity to launch "mega" programs that are beyond its ability to manage successfully. The department's really large programs, such

FIGURE 2

Nine Technology Readiness Levels

(as listed in the Assistant Secretary of Defense [Research & Engineering] TRA Guidance, April 2011)

TRL 1: Basic principles observed and reported.

TRL 2: Technology concept and/or application formulated.

TRL 3: Analytical and experimental critical function and/or characteristic proof of concept.

TRL 4: Component and/or breadboard validation in a laboratory environment.

TRL 5: Component and/or breadboard validation in a relevant environment.

TRL 6: System or subsystem model or prototype demonstrated in a relevant environment.

TRL 7: System prototype demonstrated in an operational environment.

TRL 8: Actual system completed and qualified through test and demonstration. [This is the end of true system development.]

TRL 9: Actual system proven through successful mission operations.

IS IT REALLY READY?

Instead of a subjective discussion of whether a technology is "ready," which could mean anything, TRLs originally developed by NASA allow acquisition professionals to talk about whether a technology has met a given milestone. DOD uses nine TRLs to describe a system's developmental progress. (SOURCE: Office of the Assistant Secretary of Defense for Research and Engineering)

as the Army's Future Combat System (FCS), the multiservice, multinational F-35 Joint Strike Fighter program and the Navy's Gerald R. Ford–class aircraft carrier, each reflect enormous system complexity—multiple variants, multiple new technologies and large amounts of associated software—that continues to bedevil acquisition managers. These three programs are very different from one another, but each suffers (or suffered, in the case of FCS, which was terminated in 2009) from unmanageable complexity.

This is no criticism of the management teams that guided these very important programs. Rather, it's a criticism of leadership decisions to enter into mega-programs that risk valuable funds and, because of their complexity, are unlikely to succeed on schedule and within cost. The challenges of system complexity include immature technology, both hardware and software, which may be most intractable in mega-programs but affects programs of all sizes throughout the military services.

The timing of maturing technology may not meet the development schedule of the warfighting system; the PM needs to acknowledge this with risk management plans in place should the maturing technology not be ready to meet the timetable of the emerging warfighting system. (See Figure 1.) That is, there need to be "plan B" alternatives and off-ramps for incorporating less risky hardware technology solutions in the event that the preferred technology stumbles, so as not to interrupt the completion schedule for the emerging system. GAO presented this recommendation, while not a new idea, to Congress in its October 2015 study "Defense Acquisitions: Joint Action Needed by DoD and Congress to Improve Outcomes."

At present, the paths to improved outcomes for hardware versus software appear to lead in different directions. Technology development leading to advanced hardware solutions needs to be accomplished in the technology base before being handed over for incorporation into the emerging warfighting system. On the other hand, software must be developed or adapted uniquely for a warfighting system, using highly disciplined systems engineering processes.

This suggests to me that software development supporting a new system will normally require major up-front effort, with

PMs typically push their programs forward unless their leadership tells them to halt. Therefore, if a program is not ready to move to the next developmental phase, the milestone decision authority has to be tough and disciplined.

FIGURE 3

Manufacturing Readiness Levels

(as listed in the MRL Deskbook v2.2.1, October 2012)

MRL 1: Basic manufacturing implications identified.

MRL 2: Manufacturing concepts identified.

MRL 3: Manufacturing proof of concept developed.

MRL 4: Capability to produce the technology in a laboratory environment.

MRL 5: Capability to produce prototype components in a production-relevant environment.

MRL 6: Capability to produce a prototype system or subsystem in a production-relevant environment.

MRL 7: Capability to produce systems, subsystems or components in a production-representative environment.

MRL 8: Pilot line capability demonstrated; ready to begin low-rate initial production.

MRL 9: Low-rate production demonstrated; capability in place to begin full-rate production.

MRL 10: Full-rate production demonstrated and lean production practices in place.

MANAGING MANUFACTURING RISK

As these manufacturing readiness levels show, moving from an idea to a product in a Soldier's hand is a long and multifaceted process. Managers must steer the development of new technologies and navigate the risks associated with manufacturing those technologies, all while keeping tabs on the budget and schedule. (SOURCE: OSD Manufacturing Technology Program in collaboration with the Joint Service/Industry MRL Working Group)

about half of the software development cost expended before the program's milestone B, as described in the 2007 research report "Software Architecture: Managing Design for Achieving Warfighting Capability," by Brad Naegle of NPS. It also suggests that software may be the pacing activity within hardware and software program developments—a fact reflected in many of the developmental programs in GAO's 2015 "Defense Acquisitions" annual report.

THE HOPEFUL

Acknowledging that many acquisition programs have struggled during their development, much progress has been made, particularly over the past 20 years, to help PMs successfully manage their programs. Certain established practices will help PMs and their teams understand programs more clearly and manage them more effectively. Here are four acquisition best practices and resources that are not new but can make a big difference for those who apply them conscientiously and with discipline. I offer no statistical data to support them, although some of these references contain supporting statistics.

Technology Readiness Assessment (TRA) Guidance, April 2011 (updated). Since 2001, DOD has used technology readiness levels (TRLs)—developed by NASA in the 1980s and then adapted by the Air Force Research Laboratory—in major programs, as GAO had long encouraged. Currently, DOD Instruction (DODI) 5000.02, Operation of the Defense Acquisition System, requires TRAs for major defense acquisition programs at the release of a developmental request for proposal (RFP), milestone B and milestone C.

DOD uses nine TRLs to describe the developmental progress of emerging systems as they pass through their prescribed milestones and phases. (See Figure 2, Page 141.) This common framework for technology development and common language to describe the waypoints are enormously useful to acquisition managers. Before the introduction of standardized TRLs, our understanding of the progress of developmental programs was significantly less clear; to characterize our progress, we used terminology that meant different things to different people. Today, the use of TRLs reduces the likelihood of misunderstanding whether a developing system has progressed to a specific intermediate milestone.

Manufacturing Readiness Level (MRL) Deskbook, Version 2.4, August 2015. The manufacturing readiness levels closely parallel the TRLs. Ten MRLs describe and guide progress in preparation for the manufacture of emerging warfighting systems as programs pass through their prescribed milestones and phases. (See Figure 3.)

These manufacturing readiness metrics overlay the milestones and phases of the Defense Acquisition System, providing concrete measures of preparation and activity that culminate in full-rate production. Besides the 10 levels, the MRL Deskbook identifies nine areas of manufacturing risk that call for tracking through each of the MRLs. These risk areas, or threads and sub-

FIGURE 4

Best Practices for Knowledge-Based Acquisitions	
Knowledge Point 1:	• Demonstrate technologies to a high readiness level—TRL 7—to ensure technologies will work in an operational environment [Note: DOD considers TRL 6, demonstrations in a relevant environment, to be appropriate for programs entering system development; therefore, GAO has analyzed programs against this measure as well as its preference for demonstration in an operational environment.] • Ensure that requirements for product increments are informed by preliminary design review, using systems engineering process (such as prototyping of preliminary design). • Establish cost and schedule estimates for product on the basis of knowledge from preliminary design, using systems engineering tools (such as prototyping of preliminary design). • Constrain development phase (5 to 6 years or less) for incremental development. • Ensure that development phase is fully funded (programmed in anticipation of milestone). • Align program manager tenure to complete development phase. • Ensure that contract strategy separates system integration and system demonstration activities. • Conduct independent cost estimate. • Conduct independent program assessment. • Conduct major milestone decision review for development start.
Knowledge Point 2:	• Complete system critical design review. • Complete 90 percent of engineering design drawing packages. • Complete subsystem and system design reviews. • Demonstrate with system-level integrated prototype that design meets requirements. • Complete the failure modes and effects analysis. • Identify key system characteristics. • Identify critical manufacturing processes. • Establish reliability targets and growth plan on the basis of demonstrated reliability rates of components and subsystems. • Conduct independent cost estimate. • Conduct independent program assessment. • Conduct major milestone decision review to enter system demonstration.
Knowledge Point 3:	• Demonstrate manufacturing processes. • Build and test production-representative prototypes to demonstrate product in intended environment. • Test production-representative prototypes to achieve reliability goal. • Collect statistical process control data. • Demonstrate that critical processes are capable and in statistical control. • Conduct independent cost estimate. • Conduct independent program assessment. • Conduct major milestone decision review to begin production.

A DETAILED ROAD MAP

GAO has refined a list of knowledge points designed to help acquisition programs succeed. By applying known best practices with discipline and rigor, acquisition program managers can overcome the hurdles to delivering products that perform well, on time and on budget. (SOURCE: Assessments of Selected Weapon Programs [GAO-15-342SP])

threads, comprise activities that PMs must manage to ensure the thorough planning and careful monitoring of manufacturing. The threads and sub-threads are:

- Technology and industrial base.
- Design.
- Cost and funding.
- Materials.
- Process capability and control.
- Quality management.
- Manufacturing workforce, including engineering and production.
- Facilities.
- Manufacturing management.

Knowledge Management. Since 1998, GAO has emphasized the importance of a shared understanding of critical knowledge by the PM, the intermediate acquisition chain of command and the acquisition authority at selected program decision reviews (such as milestone B) before allowing a developmental acquisition program to proceed to its next step. In 1998, three knowledge points began to take shape and have since become more detailed and useful, as shown in GAO's 2015 "Defense Acquisitions" annual report. They are:

- **Knowledge Point 1:** Technologies, time, funding and other resources match customer needs. Decision to invest in product development.
- **Knowledge Point 2:** Design is stable and performs as expected. Decision to start building and testing production-representative prototypes.
- **Knowledge Point 3:** Production meets cost, schedule and quality targets. Decision to produce first units for customer.

The shared knowledge is likely to improve risk reduction at the three points and increase confidence in decision reviews to consider advancing an acquisition program to its next developmental phase. (See Figure 4, Page 143)

GAO is right about program knowledge point management. The definitions are clear, and the specific review points align easily to milestone B, the critical design review and milestone C. Although the terminology of knowledge point management and GAO's specific recommendations have not carried over completely into DODI 5000.02, its companion document, DOD Directive 5000.01, is consistent with GAO's intent, as in the following extract:

> **E1.1.14. Knowledge-Based Acquisition.**
> PMs shall provide knowledge about key aspects of a system at key points in the acquisition process. PMs shall reduce technology risk, demonstrate technologies in a relevant environment, and identify technology alternatives, prior to program initiation. They shall reduce integration risk and demonstrate product design prior to the design readiness review. They shall reduce manufacturing risk and demonstrate producibility prior to full-rate production.

The OSD policy guidance is clear, but not as specific as GAO recommends; in retrospect, acquisition leaders have a track record of too readily ignoring a lack of "program knowledge" and forging ahead optimistically, hoping that missing knowledge will somehow materialize when necessary. Ignoring knowledge points appears misguided, however; the defense acquisition landscape is littered with programs that did not have sufficient "knowledge" to support success at the next acquisition step but were authorized to move forward anyway.

Beyond poor test results, the outcomes have been program cost growth, schedule delays, warfighting systems that only marginally perform their missions, unexpectedly high maintenance and retrofit costs, unachievable readiness goals and even systems that have been produced but cannot be deployed because they are unsuitable or ineffective. GAO has described some of these problems in its ongoing study of high-risk programs.

In my opinion, the expectation within the acquisition community is that PMs typically push their programs forward unless their leadership tells them to halt. Therefore, if a program is not ready to move to the next developmental phase, the milestone decision authority has to be tough and disciplined, not approving advancement of the program to the next acquisition phase until it meets its knowledge requirements, to ensure a reasonable likelihood of success.

From my perspective, the elephant in the room is DOD's propensity to launch "mega" programs that are beyond its ability to manage successfully.

MEGA PROJECTS, MEGA PROBLEMS

DOD has a bad habit of launching enormously complex projects that become both too big to fail and too big to succeed in anything approaching on-time, on-budget delivery, the author says. Some examples: the XM1203 Non-Line of Sight Cannon, which was part of the Army's FCS program, canceled in 2009 after the Army had spent roughly $20 billion on it; the Joint Strike Fighter, only now approaching combat readiness 15 years after contract award and on track to cost nearly $1 trillion to maintain and operate over its lifetime; and the $13 billion Gerald R. Ford class of aircraft carrier, which is two years behind schedule and has yet to consistently perform its most basic function, launching and retrieving aircraft. (Image by U.S. Army Acquisition Support Center)

Reliability Growth. The OSD's Office of the Director, Operational Test and Evaluation (DOT&E) and the Defense Science Board have clearly linked poor reliability of warfighting systems to higher sustainment costs. Research by DOT&E and the Defense Science Board pinpoints reliability and maintainability as integral parts of the systems engineering process that must be reported in connection with the systems engineering plan at milestone A, the decision point for the development RFP release, milestone B and milestone C. For Acquisition Category I programs, reliability growth curves showing the growth strategy must be part of the engineering plan and the test and evaluation master plan, to be tracked until the program achieves reliability thresholds as outlined in DODI 5000.02.

CONCLUSION

Hindsight is 20/20, as the saying goes. In retrospect, I would have applied the four best practices described here—technology readiness assessment, manufacturing readiness assessment, knowledge management and reliability growth—to my own program management during my Army career, if I had been aware of them at the time. Unfortunately they had not become part of the DOD acquisition community's collective body of knowledge.

I can say now, though, that I would advise any current or soon-to-be PM to use these best practices. They will put acquisition developmental programs on the right track for better outcomes.

For more information, go to the NPS Acquisition Research Program website at ***http://www.acquisitionresearch.net/page/view/home/****.*

MICHAEL W. BOUDREAU, COL., USA (RET.), was a senior lecturer at NPS from 1995 until his retirement from civil service in July 2016. While an active-duty Army officer, he was the project manager for the Family of Medium Tactical Vehicles within the Program Executive Office for Combat Support and Combat Service Support. He commanded the U.S. Army Materiel Support Command – Korea and the Detroit Arsenal Tank Plant. Boudreau is a graduate of the Industrial College of the Armed Forces, Defense Systems Management College and the Army Command and General Staff College. He holds an MBA and a B.S. in mechanical engineering from Santa Clara University.

SPACIOUS SKIES

Soldiers with the 2nd Armored Brigade Combat Team, 1st Infantry Division train on the Paladin during an October 2016 leaders course at Fort Riley, Kansas. The Paladin is undergoing an upgrade, and recently instituted affordability caps ensure that the Army has the funds to sustainably afford upgrading that system at the same time it upgrades the Joint Light Tactical Vehicle and the Armored Multi-Purpose Vehicle. (Photo by Spc. Elizabeth Payne, 1st Infantry Division Public Affairs)

FROM THE DIRECTOR,
ACQUISITION CAREER MANAGEMENT
LT. GEN. MICHAEL E. WILLIAMSON

BIG 'A' ACQUISITION

Achieving dominance starts early, at weapon system design, and continues to procurement, testing and deployment all the way to sustainment and disposal.

In a global security environment that is increasingly uncertain and complex, the threats and challenges of tomorrow will be overcome with the weapon systems and equipment we develop, modernize and procure today. To maintain land force dominance, we must view acquisition as a comprehensive process that takes us from the design of weapon systems to procurement, testing, deployment, sustainment and disposal. Known as "big 'A' acquisition," this process involves many stakeholders, including Congress, the industrial base, the acquisition workforce and, especially, the men and women in uniform who ultimately take these weapons to war.

Decisions made during development and approval of the acquisition strategy have a significant impact on life cycle costs, sustainability and the long-term affordability of a program. This is one of the reasons why the secretary of the Army, the Army chief of staff and other senior leaders are taking a holistic look across the full acquisition spectrum to ensure that we have an agile, affordable system that supports equipping the Solider with the right products at the right time and the right place for mission success.

AGILE ACQUISITION

Agility is an important part of the acquisition process, allowing for flexibility, adaptability and responsiveness. Examples of agile acquisition include the use of modular systems, block-upgrade approaches to system fielding and the use of open system architecture designs and standard interfaces. Innovation is equally important, including the speed and application of new and advanced capabilities for our Soldiers. Experimentation and prototyping are important in achieving the rapid introduction of advanced, game-changing technologies for our Army.

A critical element of our agile and innovative acquisition efforts is the Army Rapid Capabilities Office, a key initiative of the secretary and chief to expedite select capabilities to meet urgent and emerging threats worldwide. Although flexible in its structure, the Rapid Capabilities Office is designed to focus primarily on high-priority, threat-based projects with an intent to deliver an operational effect within the "sweet spot" between the Rapid Equipping Force (about 180 days) and programs of record (5-plus years). Initial focus areas are cyber, electronic warfare, survivability, and position, navigation and timing.

In other areas, we've reinvigorated the Army Requirements Oversight Council (AROC) to be a command-centric hub, allowing the Army to realign in light of opportunities and to make trades across cost, schedule and performance based on available resources. The revitalized AROC process provides several benefits, including clear requirements definition and alignment of a fundamental acquisition strategy to meet Army needs. In terms of requirement definitions, the AROC process solidifies a singular outcome and Army position on specific desired capabilities. Approval at the Army chief of staff level enables detailed analysis and discussion to ensure a single Army position.

SENIOR LEADER INVOLVEMENT

We've increased senior leader involvement in the Army Systems Acquisition Review Council (ASARC), which provides senior acquisition managers and functional principals the opportunity to review designated programs at formal milestones to determine whether a program or system is ready to enter the next acquisition phase. The Army acquisition executive is the decision authority. However, the Army vice chief of staff and representatives of the Army chief of staff now regularly attend ASARC meetings to ensure that what the acquisition community is approving has a full vetting across the Army.

We've taken the next step in long-range planning. For the last four years, the Long-range Investment Requirements Analysis (LIRA) has been the Army's process to project over a 30-year period the implications of decisions made in the program objective memorandum. We also had the capability portfolio review (CPR) process, which took a more focused look at a narrow set of capabilities and requirements. This year, by building upon lessons learned, we replaced both the LIRA and CPR processes with the strategic portfolio analysis review (SPAR). The SPAR process injects senior leader guidance earlier and more often and will help us make better-informed decisions on how to build the future Army.

KNOWLEDGE POINTS TO DECISION POINTS

We continue to ensure that system requirements are affordable and do not add excess technical risk to our acquisition programs. Knowledge points identify necessary requirements trade-offs at key decision points. This process is mandatory across all major programs and is a critical factor in achieving a more effective, more affordable and more responsive acquisition system. Knowledge points enable the Army chief of staff to formally review system requirements throughout the development phase. In addition, the Army has instituted affordability caps on new programs to make sure that we can sustainably afford the development and product costs. For example, we made certain that we could afford the Armored Multi-Purpose Vehicle at the same time we were producing the M109A7 Paladin and the Joint Light Tactical Vehicle.

GETTING THE BIG PICTURE

Soldiers check inventory at the supply support activity warehouse in Bahrain against data from the Global Combat Support System – Army. According to Williamson, mission dominance relies on viewing acquisition as a comprehensive process, from design and procurement to deployment, sustainment and disposal. (U.S. Army photo by Sgt. 1st Class Naurys Marte, 451st Expeditionary Sustainment Command)

Additionally, we worked closely with the U.S. Army Materiel Command to identify eight core business areas that should always transition once a system moves into sustainment. These business areas include supply chain management, technical assistance, technical data (including equipment technical manuals), sustainment maintenance, field maintenance augmentation, materiel transport, post-fielding analysis and disposal. The Army initiated a formal analysis to review these eight functional areas using five acquisition programs: Stryker, Prophet Enhanced, Shadow Tactical Unmanned Aircraft System, Q-53 Radar and several ammunition projects. We will take the recommendations from the analysis and codify these into Army policy.

In all of our efforts, a disciplined, dedicated, well-educated and experienced workforce is critical to our success. The Army Acquisition Workforce Human Capital Strategic Plan is designed to support every acquisition professional's career from

FORK IN THE ROAD

A forklift operator transports ammunition at Crane Army Ammunition Activity (CAAA), Indiana, which receives, stores and ships conventional ammunition in support of worldwide military operations. Big "A" acquisition includes every facet of a system and every stakeholder, including the acquisition workforce. (Photo courtesy of CAAA Public Affairs)

KEEP STANDING STRONG

U.S. Special Forces Green Beret Soldiers assigned to 7th Special Forces Group (Airborne) prepare to breach an entry point during Integrated Training Exercise 2-16 at Marine Corps Air Ground Combat Center, Twentynine Palms, California, in February 2016. Acquisition leaders are taking steps—improved agility, better long-range planning processes and redesigned oversight guidelines—that will help U.S. warfighters continue to maintain dominance. (U.S. Air Force photo by Tech Sgt. Efren Lopez, 3rd Combat Camera Squadron)

recruitment to retention to retirement by providing strategic tools and systems, effective communication products and personnel support. We must ensure that our civilian and military Army Acquisition Workforce professionals maintain a competitive edge in meeting the equipping needs of our Soldiers.

TOTAL DOMINANCE

Throughout our history, America has led the way. When the United States entered World War II, President Franklin D. Roosevelt set an ambitious production goal: 60,000 aircraft, 45,000 tanks and 20,000 anti-aircraft guns. While some thought it would take a miracle, the "indomitable" national spirit and patriotism of Americans prevailed, and the military-industrial complex was born. There was—and is—no limit to what we can achieve together. About a month after Pearl Harbor, President Roosevelt told Congress and the nation that "powerful enemies must be outfought and out-produced." He said, "It is not enough to turn out just a few more planes, a few more tanks, a few more guns, a few more ships than can be turned out by our enemies. We must out-produce them overwhelmingly, so that there can be no question of our ability to provide a crushing superiority of equipment in any theater of the world war."

CONCLUSION

Today's big "A" acquisition produces the most advanced weapon systems in the world. The great challenge before us is to design, procure, test, deploy and sustain weapons that preserve the technological edge that our Army has always possessed. We are committed to meeting that challenge as we have throughout our history, to ensure that America's Army remains the most formidable ground combat force on Earth.

MS. LINDSEY MILLER

COMMAND/ORGANIZATION:
U.S. Army Engineering and Support Center

TITLE:
Project manager

YEARS OF SERVICE IN WORKFORCE: 14

DAWIA CERTIFICATIONS:
Level II in facilities engineering and program management

EDUCATION:
M.S. in management and human resource management, Florida Institute of Technology; B.S. in business management and human resource management, Athens State University; associate degree in business management and accounting, John C. Calhoun Community College

AWARDS:
Special acts and performance awards (18)

Be a sponge, and listen to your grandmother

"I'll be honest: I had no idea at the age of 18 what I was getting myself into." Fortunately, things worked out well for Lindsey Miller, who parlayed a high school internship into a 14-year career with the U.S. Army Corps of Engineers. She's currently a project manager for the Chemical Warfare Materiel Design Center (CWMDC) at the U.S. Army Engineering and Support Center in Huntsville, Alabama.

Part of Huntsville's Ordnance and Explosives Directorate, the CWMDC provides the Army with environmental response capability for activities that involve chemical warfare materiel, investigating and remediating chemical weapons remnants. The CWMDC works with a variety of other government agencies, including the U.S. Army Materiel Command, the Chemical, Biological, Radiation, Nuclear and Explosives Analytical and Remediation Activity, the U.S. Army Edgewood Chemical and Biological Center, the U.S. Army Environmental Command, the U.S. Army Technical Center for Explosives Safety and the DOD Explosives Safety Board. Miller's team ensures that appropriate action is taken to address chemical warfare materiel disposal. "Knowing that my job protects human health and the environment by creating a safer tomorrow gives me the greatest satisfaction," she said.

For Miller, the hardest part of the job is dealing with scope change, which can come from the Army, her customer or state regulators. Changed site conditions have the biggest impact on chemical warfare materiel projects: more chemical warfare materiel items encountered than anticipated, which can lead to schedule delays and cost increases; or different items encountered than anticipated, which can affect work plans and safety submission changes. "We do our very best up front to read all historical information on a site, but sometimes the historical information contains data gaps or just doesn't really exist at all, with the exception of knowing that it was a former CWM site," Miller said.

"I have to evaluate each request and decide how and if to implement it, while communicating the effects on budget and deadlines to all stakeholders," she explained. "And once changes are encountered, I have to weigh each variable and lead my project delivery team to develop courses of action and then execute the best one that tries to satisfy the customer and all stakeholders."

Her work at USACE began right after high school, when she found out that the Huntsville Center was hiring students for the summer Student Temporary Employment Program (STEP). "I knew that working for the Army as a civilian was something that I definitely didn't want to turn down," said Miller. "After I had been working on summer STEP for a month or so and had gotten over all of my anxieties, I knew this is where I wanted to be." She was assigned to the executive office, but she also had the opportunity to rotate through other offices, including the travel, security and legal departments, the Engineering Directorate and the Equal Employment Opportunity Office, each with its own procedures and processes. Through the varied assignments she learned a range of skills, including how to process travel orders and vouchers, prepare memorandums and process taskers. "No other student that I know of had the opportunity to work for different offices. I was extremely fortunate," she said.

So, when the summer ended, the decision to stay was a no-brainer. "I pushed my supervisor to allow me to stay because I was learning so many new things and being given great opportunities to grow and establish a career that would allow me to make a difference working for the Army." She worked through STEP for two more years before transitioning to the Student Career Experience Program. Once she graduated from college, she was hired as a project management specialist on the unaccompanied personnel housing program. Four years later, she accepted her current position in the CWMDC.

Several years into her career, Miller opted to pursue the project management professional (PMP) certification, which she received in 2012. "Getting the PMP certification took a lot of dedication and a great deal of preparation. The process exposed me to mainstream thinking on project management standards, techniques, best practices and current trends. It also gave me the opportunity to network with other PMPs," she noted. Having the PMP gives her a better understanding of the project management framework. "I actually felt more satisfaction earning my PMP than I did when I completed my master's degree," Miller said, "because of the real-time application of the knowledge that I gained from the certification program."

Getting the PMP certification is one of several recommendations Miller would make to others interested in a similar path. Also on the list: Be a sponge. "Soak up as much information on becoming a project manager as you can. Learn the craft to make sure it's something you truly want to do. I would also recommend taking advantage of the DAWIA [Defense Acquisition Workforce Improvement Act] classes, not only in program management but in other career fields."

Looking back on her own career path, she noted that she's grateful for the colleagues she's worked with. "I've learned from watching and listening to them and learning from their mistakes as well as my own." But she added that her greatest mentor is her grandmother. "She has taught me many great things about life, but the two that have stuck with me the most are that I can do anything I set my mind to, and 'this too shall pass.' "

While the first suggestion was easy to adopt, the second was a little more difficult to grasp, Miller said. "Trials and tribulations are a part of life, both personally and professionally, and no trial experienced in life is wasted. It ministers to our education and to the development of such qualities as patience, faith, fortitude and humility. This carries into the workplace very well: We all experience project frustrations daily, but I always try to make them a learning opportunity."

—MS. SUSAN L. FOLLETT

DIGGING THE JOB

Miller and a co-worker bury inert items for the Huntsville Survey at Pine Bluff Arsenal, Arkansas, in January 2013. Pine Bluff Arsenal was one of nine Army installations in the U.S. that stored chemical weapons; Miller's team aids in the process of disposing of them. (Photo courtesy of Lindsey Miller)

FROM THE DIRECTOR,
U.S. ARMY ACQUISITION SUPPORT CENTER

SWAPPING INTEL

Strengthening ties with the intelligence community

Craig A. Spisak
Director, U.S. Army Acquisition Support Center

How well do the acquisition and intelligence communities synchronize their efforts, coordinate their activities and communicate to each other what they're doing, how they're doing it and why?

That question was an underlying theme when U.S. Army senior leaders met Sept. 15-16, 2016, for the Program Executive Office (PEO) – Deputy Assistant Secretary of the Army (DASA) Summit at the National Ground Intelligence Center (NGIC), outside Charlottesville, Virginia. The NGIC, part of the U.S. Army Intelligence and Security Command, provides scientific and technical intelligence as well as general military intelligence on foreign ground forces.

As you might guess, most of the content of that day-and-a-half gathering of PEOs, DASAs and the intelligence community can't be discussed, having been at a highly classified level. But the issue of how well the acquisition and intelligence communities synchronize their efforts, coordinate their activities and communicate with each other led to a follow-on conversation: Having more people in each of these two communities who had more experience with and knowledge of the other would foster a greater mutual understanding.

So we talked at great length about that and about how we might establish rotational and developmental opportunities whereby people from one community would work inside the other.

COMMUNICATION IS KEY

That conversation sparked a bigger question: How do we help the acquisition workforce understand the communities that are so vital to what we do in a way that leads us to

EXCHANGING EXPERTISE

The U.S. Army Intelligence and Security Command is a vital, complex and far-reaching organization. So is the Army Acquisition Workforce. Better understanding and coordination between the acquisition and intelligence communities would lead to better results for Soldiers. With that in mind, the two organizations are looking for ways to build closer ties, such as through personnel exchanges. (SOURCE: U.S. Army Acquisition Support Center)

better acquisition outcomes? While people use the term "strategic communications" very loosely, it really is important for us to consider.

If we're not very good at explaining what we do and why we do it, it shouldn't surprise us when other people are confused or distrustful, or make decisions that contradict or hinder what we do, because they just don't understand that those decisions have any impact at all.

Intelligence, resourcing, generating requirements—those are just a few of the activities and communities that have a vital role in acquisition. After all, acquisition takes an idea—"we have a capability gap"—to develop a capability and put it in the hands of Soldiers. That process represents an enormous spectrum of capabilities involving lots of different players to get as close as possible to a 100 percent solution—recognizing that sometimes an 80 percent solution is exactly what we need because we need it now.

We already do acquisition well. But there are some areas where we could do better or expand on what we're currently doing. And there are some other areas that we really haven't tapped yet. In looking at these, what do some of these other communities think their role is with respect to ours? Are their perspectives the same as ours? How do we more closely align those two viewpoints? Do we have an opportunity to support that alignment through an exchange of subject matter experts?

CONCLUSION

Within the broad pyramid that we have for career paths and development of the Army Acquisition Workforce, we talk about the idea of becoming a master of your trade within any professional community. You each have to develop some solid core functional expertise. You have to know your tradecraft.

But at some point, as you become an expert in your tradecraft, if you really want to have a larger impact, you have to branch out into broadening experiences and seek to understand how your role fits in the larger acquisition spectrum. That's when you start to put the engineering community with the test community—and the engineering and test experts with the contracting experts; and the engineering, test and contracting experts with the logistics professionals.

As you start to do that, you recognize that you might be the best engineer, but you can do only so much if you don't understand how all these other activities—test, contracting, logistics, intelligence—play into the bigger picture.

Exactly what these subject-matter expert exchanges will look like remains to be determined. My first step is to consult with the PEOs. Once they give me a feel for what they think is needed, I can reach out to the intelligence community. Together, we'll develop a way forward: figure out what's missing, come up with a plan and use the resources we have and the programs already in place to facilitate implementation. Once again, this is probably a place where the Defense Acquisition Workforce Development Fund (DAWDF) will play a big role. DAWDF has been critical to our ability to change the way we do business, primarily in developing the acquisition workforce.

The better understanding and dialogue we can achieve between the acquisition and intelligence communities, the more effective we will be at keeping our forces, the U.S. Army, the most capable and dominant army in the history of the world.

CAREER CORNER

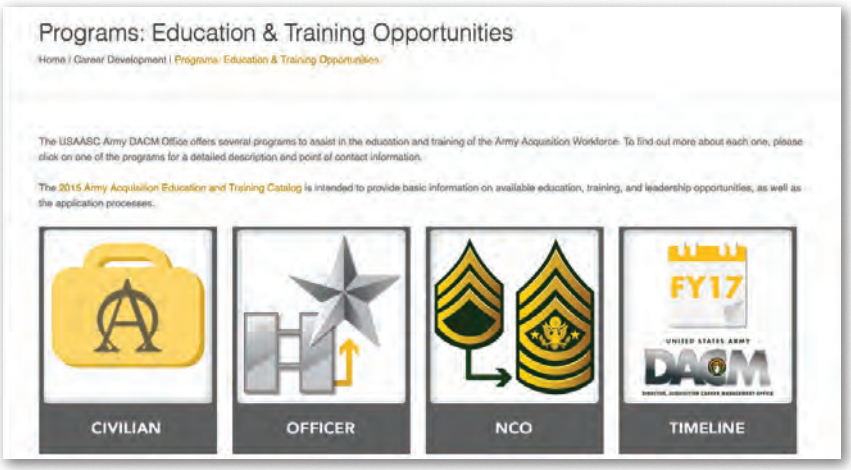
WHERE'S THAT PROGRAM LISTED?

Revamped website helps career development

To help the Army Acquisition Workforce get the most out of the time it devotes to career development, the U.S. Army Acquisition Support Center (USAASC) has revamped its programs page, rolling out a new design that helps users find what they need quickly and efficiently. The new page features icons for civilians, officers and noncommissioned officers (NCOs) that take users directly to their specific career classification and list all the programs they're eligible for. A timeline icon takes users to FY17 program announcements as well as a fiscal year calendar for longer-term planning.

In redesigning the site, the USAASC addressed several challenges, including categorizing the programs appropriately and reducing the redundancy in the previous version. We think we've come up with a solution that's easy to understand and maneuver through. Questions, comments or feedback about the new page can be directed to **usarmy.belvoir.usaasc.mbx.usaasc-events@mail.mil.**

And on the topic of career development, below is a list of classes, programs and funding opportunities that will be opening over the next few months. More information is available at **http://asc.army.mil/web/career-development/programs/**.



DEFENSE ACQUISITION UNIVERSITY SENIOR SERVICE COLLEGE FELLOWSHIP

Description:
Ten-month leadership and educational opportunity designed to prepare senior-level civilians for key leadership roles. Conducted at Huntsville, Alabama; Warren, Michigan; and Aberdeen, Maryland.

Eligibility:
GS-14 and GS-15 or broadband equivalent; Acquisition Corps member; bachelor's degree; Level III certification in current position; Army Civilian Education System Advanced Course; secret clearance.

Website:
http://asc.army.mil/web/career-development/programs/defense-acquisition-university-senior-service-college/.

Announcement opening: Jan. 23
Announcement closing: March 23
Applicant selection notification date: May 1 (tentative)
Program start: July

ACQUISITION LEADERSHIP CHALLENGE PROGRAM (ALCP)–THIRD QUARTER

Description:
The leadership development seminar, offered at three different levels, is designed to establish a foundation of self-awareness and to bolster organizational leadership and diversity development.

Eligibility:
- Civilian acquisition workforce
- ALCP B = GS-7 – GS-11 or equivalent
- ALCP I = GS-12 and GS-13 or equivalent
- ALCP II = GS-14 and GS-15 or equivalent

Website:
http://asc.army.mil/web/career-development/programs/acquisition-leadership-challenge-program/

Announcement opening: Feb. 1
Announcement closing: Feb. 28

DEFENSE ACQUISITION WORKFORCE DEVELOPMENT FUND (DAWDF)

Description:
DAWDF is designed to address gaps in the acquisition workforce by serving as a funding source for training, recruitment and development initiatives that target acquisition competencies and hiring across mission-critical acquisition career fields. Commands can submit a request to use DAWDF funds to implement training, development, retention and recruitment programs.

Eligibility:
Army acquisition organizations with a requirement that meets the intent of DAWDF may request funds by submitting a program request form.

Website:
http://asc.army.mil/web/career-development/dawdf-program/

Announcement opening: Feb. 1
Announcement closing: May 19
Board dates: June 21-22
Command notification date: Sept. 1

NAVAL POSTGRADUATE SCHOOL MASTER OF SCIENCE IN PROGRAM MANAGEMENT (NPS-MSPM) OR SYSTEMS ENGINEERING (NPS-MSSE)

Description:
NPS-MSPM is a distance-learning course designed to help acquisition professionals acquire the knowledge, skills and abilities to lead and manage programs and projects more effectively within complex organizations; it provides concepts, methodologies and analytical techniques. NPS-MSSE aims to help students address systems engineering and integration challenges by providing the technological tools to better meet the needs of the customer.

Eligibility:
Civilian acquisition workforce (both programs); GS-11 – GS-15 or equivalent.

Website for NPS-MSPM:
http://asc.army.mil/web/career-development/programs/naval-postgraduate-school-master-of-science-in-program-management/

Website for NPS-MSSE:
http://asc.army.mil/web/career-development/programs/naval-postgrad-ms-sys-eng/

In redesigning the site, the USAASC addressed several challenges, including categorizing the programs appropriately and reducing the redundancy in the previous version.

Announcement opening: Feb. 22
Announcement closing: April 11
Applicant selection notification date: May 16

ADVANCED CIVIL SCHOOLING

Description:
Provides attendees with the opportunity to pursue advanced degrees at civilian universities on a full-time, fully funded basis.

Eligibility:
Army acquisition officers and NCOs.

Website:
http://asc.army.mil/web/career-development/programs/advanced-civil-schooling/

Announcement opening: March 15
Announcement closing: June 5
Applicant selection notification date: July 15
(Dates are tentative.)

—MS. ASHLEY TOLBERT

HARD WORK PAYS OFF

Army organizations and individuals are well-represented among DOD's 2016 Acquisition Awards

by Ms. Susan L. Follett

Three Army civilians and a handful of Army organizations garnered top acquisition honors from DOD late last year, earning 2016 Defense Acquisition Workforce Achievement Awards as well as the David Packard Excellence in Acquisition Award and the Should Cost and Innovation Award.

"These awards were established to recognize individuals and teams that have demonstrated excellent performance in the acquisition of products and services for the Department of Defense," said the Hon. Frank Kendall, undersecretary of defense for acquisition, technology and logistics, in announcing the winners. "It is with great pride that we recognize the outstanding accomplishments of all our acquisition professionals and acknowledge those whose contributions represent the best of the best."

The **U.S. Army Contracting Command (ACC)** was doubly honored, with **ACC-Warren (Michigan)** winning silver honors in the Workforce Development Award – Large Organization category and **Sharon D. Valle** of ACC-Rock Island (Illinois) receiving the Workforce Individual Achievement Award in the Industrial Property category.

Valle was the first government property administrator and plant clearance officer assigned to the Blue Grass Chemical Agent-Destruction Pilot Plant project in Richmond, Kentucky, an Acquisition Category I-D project that had been going on for seven years before her arrival. The project, administered by ACC-Rock Island, encompasses the design, construction, systemization, testing, operation and closure of the facilities that will destroy the chemical munitions stockpile at the Blue Grass Army Depot. Valle's efforts ensured property accountability for hundreds of thousands of pieces of government property—valued at almost $2 billion—improving safety and resulting in millions of dollars of cost avoidance.

ACC-Warren was recognized for its efforts in talent management, knowledge transfer, workforce development and employee recognition, part of an overall goal of developing and improving the acquisition workforce's qualifications and professionalism. ACC-Warren obligated almost $308,000 in Defense Acquisition Workforce Development Fund (DAWDF) dollars for acquisition workforce training in FY15, and planned another $500,000 in FY16. The organization created a feedback tool that allows employees to assess and rate their supervisors on important competencies, and developed "Buyer Boot Camp," a six-week orientation course that familiarizes entry-level contracting specialists with the acquisition and contracting process. Additionally, the organization took steps to better align performance ratings with actual performance, introduce and sustain performance objectives, and train managers to provide meaningful, timely feedback.

JPO JLTV WINS AGAIN

JPO JLTV, a joint program between the Army and the Marine Corps that operates under the PEO for Combat Support and Combat Service Support, received the 2016 Should Cost and Innovation Award. JPO JLTV also received Packard awards in 2015 and 2013. (Photo courtesy of Oshkosh Defense)

BLUE GRASS WORK HONORED

Contractors at the Blue Grass Chemical Agent-Destruction Pilot Plant in Richmond, Kentucky, prepare reinforcing steel for concrete pads for the bulk waste storage area. Sharon D. Valle of ACC-Rock Island received the Workforce Individual Achievement Award in the Industrial Property category for her work tracking hundreds of thousands of pieces of government property on the Blue Grass project. (U.S. Army photo)

Also doubly honored was the Program Executive Office (PEO) for Ammunition: **Paul Manz** received the Individual Achievement Award in the Engineering category, and the **Project Manager for Maneuver Ammunition Systems (PM MAS)** received the David Packard Excellence in Acquisition Award.

Manz is chief scientist, chief engineer and chief technology officer for PEO Ammunition, overseeing transition and insertion of enabling technologies across a $3 billion munitions and armaments portfolio and PEO Ammunition's $100 million annual research and development budget. He accelerated the integration of GPS technologies across DOD's precision armaments portfolio and led a joint initiative to assess the maturity of Air Force M-Code GPS technology for subsequent use by multiple joint programs of record, an effort that avoided $170 million in potentially duplicative activities.

PM MAS, which provides direct-fire combat and training ammunition capabilities to warfighters across all of the services and the U.S. Special Operations Command (USSOCOM), was recognized for its innovative acquisition of nonstandard ammunition in support of operations to counter the Islamic State group and ongoing conflicts in the U.S. Central Command area of responsibility. Faced with increasing demand and a limited supplier base that delayed product delivery, PM MAS employed several life cycle management initiatives as well as principles from several focus areas of Better Buying Power to reduce delivery times from 24-36 months to six months or less. It's the second Packard Award for PM MAS, which received its first in 2011 for efforts to field the 5.56 mm Enhanced Performance Round. Another PEO Ammunition organization, the Project Manager for Combat Ammunition Systems, received the Packard Award in 2012.

Rounding out the list of Army award winners are **Jacki A. Garner, U.S. Army Europe (USAREUR)**, who received the Individual Achievement Award in the Information Technology category, and the Joint Program Office for Joint Light Tactical Vehicles (JPO JLTV), which received the 2016 Should Cost and Innovation Award.

Garner led efforts to develop an effective framework for processing information technology (IT) contracts within USAREUR. She created an IT acquisition working group, which included representatives from the 409th Contracting Support Brigade (CSB) and USAREUR major subordinate commands, that established processes to streamline IT acquisitions and resulted in all IT contracts being awarded on time. She persuaded the 409th CSB's principal adviser responsible for contracting to allow her

AMMUNITION INNOVATION

Iraqi soldiers cross a road during a training event at Camp Taji, Iraq, in March 2015. PM MAS, which provides direct-fire combat and training ammunition capabilities to warfighters across all of the services, won the David Packard Excellence in Acquisition Award for its innovative acquisition of nonstandard ammunition to augment the fight against the Islamic State group in Iraq, and to support other conflicts in the U.S. Central Command area of responsibility. (U.S. Army photo by Sgt. Cody Quinn, Combined Joint Task Force – Operation Inherent Resolve Public Affairs)

staff to solicit a five-year contract version of a two-year offload—transfer to another agency for contract support—of the USAREUR Theater Mission Command IT contract, providing 284 contractors at a cost of $206 million. That effort saved countless man-hours by not having to process a two-year offload acquisition packet three times over that period. She also was part of efforts to create theater IT acquisition processes and an IT investment governance and management program that was instrumental in saving her command nearly $6 million in IT procurements.

A joint program between the Army and the Marine Corps, **JPO JLTV** operates under the **PEO for Combat Support and Combat Service Support**. During engineering and manufacturing development, JPO JLTV allowed vendors to develop and test their own solutions to meet the requirements, to reduce program risk and to better understand the relationship between warfighter requirements and program costs. This strategy gave warfighters an opportunity to see various designs with different levels of performance and cost and proved that key performance parameters, key system attributes and most of the remaining requirements were achievable at or below the program's average unit manufacturing cost. The program office then used the cost and performance data from the competitive prototyping initiative to develop source selection criteria that better enabled industry to make cost-informed design decisions. The resulting design decisions achieved significant long-run cost savings while ensuring full and open competition in future production contracts. It's the third Packard Award in four years for JPO JLTV, which also received the award in 2015 and 2013.

Also among the year's big winners was USSOCOM, which earned five individual awards and two team awards. The full list of awards and winners follows, with Army recipients highlighted.

INDIVIDUAL ACHIEVEMENT AWARD WINNERS

Acquisition in an Expeditionary Environment: Air Force Lt. Col. Bernie E. Beigh, USSOCOM

Auditing: Laura Michaels, Defense Contract Audit Agency

Contracting and Procurement: Polly A. McCall, Air Force Materiel Command (AFMC)

Cost Estimating: Mary M. Mertz, Office of the Deputy Assistant Secretary of Defense for Materiel Readiness

Earned Value Management: Denise Kerby, Missile Defense Agency (MDA)

Engineering: Paul Manz, PEO Ammunition

Financial Management: Denise Mallett, Naval Air Systems Command (NAVAIR)

Industrial Property: Sharon D. Valle, ACC-Rock Island

Information Technology: Jacki A. Garner, USAREUR

Life Cycle Logistics: Air Force Lt. Col. Kelly L. Polsgrove, Global Positioning Systems Directorate

Production, Quality and Manufacturing: Navy Capt. Joseph M. Tuite, Naval Sea Systems Command

Program Management: Robert R. Hurd Jr., USSOCOM

Requirements Management: Andrew Yee, USSOCOM

Science and Technology Manager: Matthew Meininger, AFMC

Services Acquisition: Ashley M. Farrier, USSOCOM

Small Business: Christopher A. Harrington, USSOCOM
Test and Evaluation: Scott Wilson, MDA

UNDERSECRETARY OF DEFENSE FOR ACQUISITION, TECHNOLOGY AND LOGISTICS CHAIRMAN'S AWARD

Navy Capt. John Bailey, NAVAIR

WORKFORCE DEVELOPMENT AWARD – LARGE ORGANIZATION

Gold: 431st Supply Chain Management Squadron, Tinker Air Force Base, Oklahoma
Silver: ACC-Warren
Bronze: Defense Contract Audit Agency, Fort Belvoir, Virginia

WORKFORCE DEVELOPMENT AWARD – SMALL ORGANIZATION

Gold: Resource Management Division, Contracting Directorate, Air Force Life Cycle Management Center, AFMC, Wright-Patterson Air Force Base, Ohio
Silver: Airborne Anti-Submarine Warfare Systems Engineering Division, Naval Air Warfare Center-Aircraft Division-4.5.14
Bronze: Special Operations Forces Acquisition, Technology and Logistics, USSOCOM

DAVID PACKARD EXCELLENCE IN ACQUISITION AWARD

PM MAS, PEO Ammunition
Next Generation Jammer Increment 1 Team, U.S. Navy
Acquisition Rapid Response Light Tactical Vehicle Team, USSOCOM

SHOULD COST AND INNOVATION AWARD

JPO JLTV

For more information about acquisition awards, go to ***http://asc.army.mil/web/acquisition-awards/****.*

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 three decades of experience as a journalist and has written on a variety of public- and private-sector topics, including modeling and simulation, military training and technologies and federal environmental regulations.

AND THE AWARD GOES TO …

The Army Acquisition Workforce includes more than 37,000 highly talented professionals, all of whom have achievements of which they can be proud. But only so many awards are given out every year. Here are a few tips to help your nomination stand out from all the rest.

Prepare well in advance.
Start the process early and give yourself plenty of time. Like birthdays and holidays, these awards come around at the same time each year, so there's no excuse not to be ready. Nominations for DOD acquisition awards are collected at the direct reporting unit level every spring, and the deadline is usually at the end of May. Nominations for the Army Acquisition Executive's Excellence in Leadership Awards and the Secretary of the Army Excellence in Contracting Awards are due in the summer. Consider the stars in your organization, figure out early on who or what program would be a good candidate for nomination and keep track of measurable successes.

Read the instructions carefully.
Review the instruction packets completely—word by word, page by page. What are the award requirements? Who's eligible? How are the winners chosen? What does your paperwork need to look like? As you move through the process of finalizing

your nomination, keep going back to the requirements to make sure that all aspects of the nomination are addressed succinctly but completely.

Use the judging criteria as an outline for organizing your nomination. Using the same criteria headings in your write-up enables judges, who have limited time to review each nomination, to quickly evaluate your nominee and will reduce the chance that critical information will be overlooked.

Follow the guidelines.
Three pages means three pages. One page means one page. Don't use wider margins or smaller fonts to cram more onto a page. Instead, hone your narrative: Use concise language to meet the requirements. If you've tried all that and still exceed the page limit, consider modifying the format: bullets, acronyms and brief statements can effectively convey a lot of information in a small amount of space. Judges are selected because of their expertise in the award area, so they're likely to understand terminology that would confuse a layperson.

Tell a story.
Telling a story does not necessarily mean moving chronologically from beginning to end. It means giving each element of the nomination a logical flow so that judges get a clear picture of the accomplishment and can see clearly why the individual is deserving of recognition. Try this structure:

a. This is what the nominee achieved.
b. This is why it's important.
c. This is the effect of that achievement.

The same schema can be used to express the value of the achievement and the example of the individual's leadership. Eliminate phrases that are likely repetitive and just take up space, such as "in this position" and "in this capacity."

Be specific.
Substantiate all claims. If you say some program is "the best" or that a system is faster or stronger, make sure the language in the nomination backs that with facts that can be documented. Use these points, for example:

- What measurable outcomes resulted from the nominee's achievement?
- Include specific achievements and tangible benefits.
- Clearly articulate the challenges and scope of responsibilities.
- How did the accomplishments impact the unit or command?

Talk with your nominee and those who work with him or her to identify specifics about the nominee's leadership. How have these accomplishments affected the team, the organization or individual team members?

DO NOT cut and paste from requirements documents or an organization's marketing literature.

Be concise.
Avoid overuse of superlatives and empty-sounding praise. A little puffed-up language is fine in award nominations if it is used sparingly. But nomination forms are short, and most often the space can be better filled with information that supports your claim. Specifically:

- Avoid the use of too many pronouns and run-on sentences.
- Use simple tenses: "led" rather than "has led." "Did" rather than "has done."
- Choose active voice—"Gen. Smith decided to overhaul the program"—over passive voice: "A decision was made to overhaul the program."

Proofread. Then proofread again.
Make sure you and at least one other person proofread your statements. Grammatical errors and misspelled words detract from the quality of the nomination.

Information about upcoming acquisition awards and past winners can be found at ***http://asc.army.mil/web/acquisition-awards/***. Good luck!

—Army AL&T Staff

RECOGNIZING ARMY ACQUISITION ACHIEVEMENT

Awards recognize the year's noteworthy contributions to funding, fielding, developing and sustaining equipment and services for U.S. warfighters

by Ms. Susan L. Follett

The year 2016 ended with a flurry of awards in the Army acquisition community in particular, including the Army Acquisition Executive's Excellence in Leadership Awards, the Maj. Gen. Harold J. "Harry" Greene Awards for Acquisition Writing, the 2016 Army Modeling and Simulation Award in Acquisition and the Secretary of the Army Excellence in Contracting Award. The Program Executive Office for Missiles and Space (PEO MS) netted four awards, with the PEO for Aviation earning two.

Steffanie B. Easter, the senior official performing the duties of the assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)) and the Army acquisition executive (AAE), and Lt. Gen. Michael E. Williamson, ASA(ALT) principal military deputy, presided over the Dec. 1 awards ceremony, which was hosted by Brig. Gen. Brian P. Cummings, the PEO for Soldier.

"You are the best group of professionals I've ever met. My confidence in you is unwavering. I will put you guys against anybody any day," Easter said, later adding, "We're going from good to great in everything we do."

At PEO MS, **Alfreda Green**, **Lawrence Nevins** and **Jeannie Sommer** received awards in the categories of Logistician of the Year, Acquisition Support Professional of the Year and the Honorable Dr. Claude Bolton Jr. Engineer and System Integrator of the Year Award, respectively.

Sommer, systems integration and test engineering lead, played a key role in the successful demonstration of the Indirect Fire Protection Capability Increment 2 – Intercept's end-to-end kill chain. She's the first to receive the Bolton award, which pays tribute to the distinguished former ASA(ALT) who died in July 2015.

Green provides logistical support for the HELLFIRE Missile, the Joint Air-to-Ground Missile, and Aviation Rockets and Small Guided Munitions, all Acquisition Category I programs. She provided new equipment training to support deployment of the first ever U.S. Army Advanced Precision Kill Weapon System in

ALL-STAR LINEUP

Steffanie B. Easter, center, Lt. Gen. Michael E. Williamson, fourth from right, Christopher Lowman, acting principal deputy ASA(ALT), far left, and Sgt. Maj. Rory Malloy, second from left, join in a group photo of the winners of the 2016 Army Acquisition Executive Leadership Awards and Maj. Gen. Harold J. "Harry" Greene Awards for Acquisition Writing. (Photo courtesy of PEO Soldier)

theater, supported critical HELLFIRE Missile requirements in support of U.S. contingency operations, implemented improved depot operations and executed a life cycle sustainment plan for the joint air-to-ground missile's engineering and manufacturing development phase.

Nevins, assistant product manager for the Multiple Launch Rocket Systems Launcher M270A1 program, oversaw development and sustainment of the M270A1 launcher, including the Improved Armored Cab (IAC) and the Fire Control System Universal programs. His leadership resulted in the successful design and production of new IAC prototypes for the Army.

Nevins shares his award with Timothy White of PEO Aviation, honored for his work as program integrator in the Aviation Ground Support Equipment Product Management Office. White led a team of nearly 400 in providing logistics oversight of 1,200 pieces of Army aviation equipment while deployed to Afghanistan, improving readiness as well as communication. He has recently been selected to serve as director of continuous process improvement deployment for PEO Aviation.

Also honored is PEO Aviation's **Cora Knapp**, who received the Thomas E. "Tom" Mullins Business Operations Professional of the Year Award. Knapp is the business and financial manager for the Medium Altitude Endurance Product Office within the Unmanned Aircraft Systems Project Management Office. She is the first recipient of the award, which was established in 2016 and pays tribute to Mullins, an acquisition professional—deputy assistant secretary of the Army for plans, programs and resources at the time of his death in February 2016—who dedicated his career to providing the best equipment for warfighters.

The PEO for Ammunition's **Project Manager for Maneuver Ammunition Systems (PM MAS)** received the Project Management/Product Director Office Team of the Year (O6 Level), marking the second honor the team received this year. Led by Col. Moises Gutierrez, PM MAS also received the 2016 David Packard Excellence in Acquisition Award. PM MAS managed a $1.2 billion portfolio that encompasses more than 316 individual items and spans small, medium and large calibers of U.S. direct fire

ammunition. The PM MAS team delivered more than 877 million rounds to all services and facilitated the procurement and delivery of nonstandard ammunition to theaters of operation.

Among the eight winners of the Maj. Gen. Harold J. "Harry" Greene Awards for Acquisition Writing were two repeat winners. **Maj. Hassan M. Kamara** of PEO Missiles and Space, this year's winner in the category of future operations, won honorable mention in that category in 2015. **Joe Novick**, this year's honorable mention in the acquisition reform/better buying power category, was the winner in the same category last year.

A complete list of all the awards and winners follows.

2016 Army Modeling and Simulation Award in Acquisition
Product Manager for Special Operations Forces Training Systems, Program Executive Office (PEO) for Simulation, Training and Instrumentation

Acquisition Support Professional of the Year (Tie)
Lawrence J. Nevins, Program Executive Office for Missiles and Space (PEO MS)

Timothy K. White, PEO Aviation

Thomas E. "Tom" Mullins Business Operations Professional of the Year
Cora S. Knapp, PEO Aviation

Defense Exportability and Cooperation Professional of the Year
Toni S. McNeal, Joint Munitions Command

Hon. Dr. Claude Bolton Jr. Engineering and Systems Integration Professional of the Year
Jeannie L. Sommer, PEO MS

Logistician of the Year
Alfreda W. Green, PEO MS

Science and Technology Professional of the Year
Matthew T. Lazzaro, U.S. Army Materiel Command's Communications-Electronics, Research, Development and Engineering Center

Product Management/Product Director Office Professional of the Year (O5 Level)
Lt. Col. Mark P. Henderson, PEO for Command, Control and Communications – Tactical

Project Management/Product Director Office Professional of the Year (O6 Level)
Col. Glenn A. Dean III, PEO for Ground Combat Systems

Product Management/Product Director Office Team of the Year (O5 Level)
Joint Assault Bridge Integrated Product Team, PEO for Combat Support and Combat Service Support

Project Management/Product Director Office Team of the Year (O6 Level)
Project Manager for Maneuver Ammunition Systems Team, PEO Ammunition

Secretary of the Army Excellence in Contracting Barbara C. Heald Award
Natanielle L. Little, U.S. Army Corps of Engineers, Transatlantic Afghanistan District

THE 2016 MAJOR GENERAL HAROLD J. "HARRY" GREENE AWARDS FOR ACQUISITION WRITING

Acquisition Reform/Better Buying Power
Winner: David M. Riel, Defense Acquisition University – Midwest Region
Honorable Mention: Joe Novick, Joint PEO for Chemical and Biological Defense

Future Operations
Winner: Maj. Hassan M. Kamara, PEO MS
Honorable Mention: Lt. Col. James Howell, Department of the Army system coordinator

Innovation
Winner: Maj. Andrew Miller, PEO Soldier
Honorable Mention: Lt. Col. Rachael Hoagland, Training with Industry (TWI) fellow, Amazon.com Inc.

Lessons Learned
Winner: Lt. Col. Patrick "Josh" Baker, TWI fellow, General Dynamics Corp.
Honorable Mention: Lt. Col. Steven G. Van Riper and the Special Operations Forces Acquisition, Technology and Logistics Team

For more information about the Army acquisition awards, go to ***http://asc.army.mil/web/acquisition-awards/****. You can read the winning entries from the 2016 Major General Harold J. "Harry" Greene Awards, as well as those earning honorable mention, in the special supplement accompanying this issue.*

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ON THE MOVE

EASTER APPOINTED TO LEAD ASA(ALT)

Steffanie B. Easter has been appointed the senior official performing the duties of the assistant secretary of the Army for acquisition, logistics and technology (ASA(ALT)) and Army acquisition executive, filling the post vacated Nov. 1, 2016, by the Hon. Katrina McFarland.

Formerly the principal deputy to the ASA(ALT), Easter has more than 30 years of federal service. She has been the executive director for the F-35 Lightning II Joint Program Office; the assistant deputy chief of naval operations for manpower, personnel, training and education; the assistant commander for acquisition for Naval Air Systems Command (NAVAIR); and the deputy program executive officer for tactical aircraft programs. She was appointed to the Senior Executive Service in December 2002.

Easter has an M.S. in engineering management and a B.S. in chemical engineering and is a graduate of the Defense Systems Management College and the NAVAIR Senior Executive Management Development Program. She has received the Navy Meritorious Civilian Service Award, the Navy Superior Civilian Service Award and the Navy Distinguished Civilian Service Award. She is also the recipient of the 2009 National Women of Color Award for Managerial Leadership and the Black Engineer of the Year Award for Professional Achievement.

MCFARLAND STEPS DOWN

The **Hon. Katrina McFarland** retired Nov. 1, 2016, from her position as ASA(ALT) leader, ending nine months in the role and a nearly 30-year career in the public sector. As the senior ASA(ALT) official since Feb. 1, 2016, McFarland led the creation of the Army's Rapid Capabilities Office and implemented the program management review process, which addressed what she described as "a lot of churn" among program managers that at times diverted them from their regular duties.

"Katrina has done a fantastic job of focusing the department's efforts on the challenges of acquisition, on streamlining acquisition and on bringing Army modernization efforts to the forefront," said Secretary of the Army Eric Fanning.

Knowing that as one of President Obama's political appointees, she would be with the Army for a short time, McFarland said, she focused on what she felt she could contribute. "A lot of them were about programs, capability, process, practice, pretty much all-around things I had sort of targeted. I went in to the chief and the vice and the acting secretary, and ... said, 'Here's what I think I should be doing. Do you have anything different?' They gave me a couple of additional items to pull together."

In the program management review process, when a program was proceeding according to plan, program managers would have the latitude to make decisions on their own, freeing them from repeatedly having to return to higher authorities and stakeholders to explain their decisions. This established more uniform expectations of how they should be executing their programs, McFarland said. "So the burden of how many reviews, how many times they go up to the Hill, how many times they are trying to convince somebody who is new in the organization, is limited. That allows them freedom of motion," she said.

Over the course of her career, McFarland also served as assistant secretary of defense for acquisition, president of the Defense Acquisition University and director for acquisition for the Missile Defense Agency. She received an honorary doctoral degree in engineering from the University of Cranfield, United Kingdom; the Presidential Meritorious Executive Rank Award, the Secretary of Defense Medal for Meritorious Civilian Service Award, the Department of the Navy Civilian Tester of the Year Award and the Navy and Marine Corps Commendation Medal for Meritorious Civilian Service.

U.S. ARMY MATERIEL COMMAND (AMC)

NEW LEADERSHIP AT AMC

Gen. Gustave F. "Gus" Perna receives the AMC colors from **Gen. Mark A. Milley**, Army chief of staff. Perna assumed command of AMC from outgoing Commanding General (CG) **Gen. Dennis L. Via** during a Sept. 30, 2016, ceremony at Redstone Arsenal, Alabama.

Perna, whom Milley promoted in a private ceremony preceding the change of command, returns to AMC after serving two years as the Army's deputy chief of staff, G-4, overseeing policies and procedures for Army logisticians worldwide. Previously he was AMC's deputy chief of staff for logistics and operations.

His other posts include CG, Joint Munitions Command and Joint Munitions and Lethality Life Cycle Management Command; commander, Defense Supply Center Philadelphia, Defense Logistics Agency; and commander, 4th Sustainment Brigade, 4th Infantry Division (Mechanized). He holds an M.S. in logistics management from the Florida Institute of Technology, a B.S. in business management from the University of Maryland University College and an A.S. in business from Valley Forge Military Junior College. (Photo by Doug Brewster, AMC)

VIA RETIRES AFTER 36 YEARS

After relinquishing the reins of AMC, **Gen. Dennis L. Via**, right, officially ended his Army career with a retirement ceremony led by Army Chief of Staff **Gen. Mark A. Milley** at Joint Base Myer-Henderson Hall, Virginia, on Oct. 6, 2016.

Via became the 18th CG of AMC in August 2012 and was the only CG to serve the entire tenure at Redstone Arsenal. The first member of his family to obtain a college degree, Via is one of eight African-American four-star generals and the first Signal Corps officer to achieve the rank. He previously served as AMC deputy CG and chief of staff under Gen. Ann E. Dunwoody.

"While leaving is a very difficult and lonely task, for sure, and certainly bittersweet, I do so proudly, knowing that I have been extremely fortunate and blessed to have served with some of our finest leaders, Soldiers and Department of the Army civilians our nation has produced," Via said.

Commissioned into the Army in 1980 at Virginia State University as a distinguished military graduate with a B.S. in industrial arts, Via also earned a master's in human resources from Boston University and attended the U.S. Army Command and General Staff College and the U.S. Army War College. He commanded at every echelon of the Signal Corps in the course of his Army career and made his mark in the field of cybersecurity, serving as director for command, control, communications and computer systems, J-6, for the Joint Staff and previously as CG of U.S. Army Communications-Electronics Life Cycle Management Command and Fort Monmouth in New Jersey.

An Oct. 13 article in the Pentagram newspaper quoted Milley's praise for Via's leadership of AMC. "It is an unbelievably complex and exceptionally competent organization"—with a presence in all 50 states and 144 countries and a budget of more than $50 billion—"and Dennis led it all," Milley said. "You can leave our ranks today with the confidence that you leave behind a generation of leaders who've grown up under your outstanding mentorship," he told Via.

Among his awards and decorations, Via is a recipient of the Defense Distinguished Service Medal, Distinguished Service Medal (with two bronze oak leaf clusters (OLCs)), Defense Superior Service Medal, Legion of Merit (with one bronze OLC), Defense Meritorious Service Medal (with one bronze OLC), Meritorious Service Medal (with four bronze OLCs), Army Commendation Medal (with one bronze OLC), Joint Service Achievement Medal and Army Achievement Medal. (U.S. Army photo by Sgt. 1st Class Chuck Burden, HQDA)


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U.S. ARMY CONTRACTING COMMAND (ACC)

1: NEW LEADER INSTALLED AT ECC

Brig. Gen. Paul H. Pardew accepted the guidon for the U.S. Army Expeditionary Contracting Command (ECC) from **Maj. Gen. James E. Simpson**, CG of ECC's parent, ACC, during a ceremony at Redstone Arsenal on Oct. 14, 2016. Pardew assumed command from **Brig. Gen. Michael D. Hoskin**, right.

Pardew has a long history with ECC and ACC and multiple assignments in Army contracting, including a tour as the ECC chief of staff. The first commander of the 414th Contracting Support Brigade, Pardew returned to ECC after serving as the director of the Forward Operational Contract Support Integration Cell, U.S. Central Command, Qatar.

Hoskin, who had been ECC commander since August 2014, now serves as director for contracting in the Office of the ASA(ALT). ECC awards more than 30,000 contractual actions valued at more than $1.9 billion annually and manages contracts totaling more than $21 billion. (U.S. Army photo by Ed Worley, ACC)

2: ACC STANDS UP RESERVE ELEMENT

Brig. Gen. Jeffrey A. Doll, right, commander of the U.S. Army Reserve Sustainment Command (ARSC), **Col. Andrew M. Lawfield**, left, and **Sgt. Maj. Michael Brown** unfurl the colors to signify the official activation of the U.S. Army Contracting Command – Army Reserve Element (ACC-ARE), during a ceremony Oct. 31, 2016, at ARSC Headquarters in Birmingham, Alabama. Lawfield will serve as commander of ACC-ARE and Brown as senior enlisted adviser.

The ARSC is a subordinate command of the 377th Theater Support Command, the largest sustainment command within AMC. The new organization was codified in a memorandum of understanding (MOU) signed by **Maj. Gen. James E. Simpson**, ACC CG, and **Maj. Gen. Les J. Carroll**, CG of the 377th. "This ceremony cements the MOU, the Total Army Force policy, and a commitment from the Army Reserve to ACC and AMC that we together as one will rise to meet and accomplish the challenges of the Army," Doll said. ACC and the ACC-ARE are located on Redstone Arsenal. (U.S. Army photo by Staff Sgt. Sheila Holifield)

PEO AMMUNITION

3: NEW DEPUTY PEO AT AMMUNITION

Brig. Gen. Alfred F. Abramson III, right, assumed the responsibilities of deputy program executive officer (PEO) for ammunition and senior commander for Picatinny Arsenal, New Jersey, during a change of management ceremony Nov. 14, 2016. He replaces **Brig. Gen. Patrick W. Burden**, left, who now serves as PEO for enterprise information systems. Starting a new tradition, Burden passed ceremonial cannon gate keys to Abramson to signify the transfer of responsibility. Previously the deputy joint PEO for chemical and biological defense at Aberdeen Proving Ground (APG), Maryland, Abramson was promoted to brigadier general during a Nov. 9, 2016, ceremony at APG. (U.S. Army photo)

PEO ENTERPRISE INFORMATION SYSTEMS (PEO EIS)

4: DPEO AMMUNITION NOW PEO EIS

Brig. Gen. Patrick W. Burden, right, received the charter of the Program Executive Office for Enterprise Information Systems (PEO EIS) during a ceremony at Fort Belvoir, Virginia, on Nov. 29, 2016. **Steffanie B. Easter**, the senior official performing the duties of the ASA(ALT), presided over the ceremony, in which acting PEO **Terry Watson** relinquished the charter to Burden. Watson, who had been serving as acting PEO since the November 2015 departure of **Douglas Wiltsie**, will resume her role as deputy PEO.

Burden most recently served as deputy PEO for ammunition and senior commander at Picatinny Arsenal, New Jersey, and the deputy to the deputy for acquisition and systems management in the Office of the ASA(ALT). His new assignment marks a return to PEO EIS, where

he previously served as the project manager for the General Fund Enterprise Business System (GFEBS) and product manager for the former Joint-Automatic Identification Technology program. (Photo by Paul Lara, Belvoir Eagle)

1: NEW PRODUCT LEAD AT DWTS

Lt. Col. August "Gus" Muller, right, was introduced as the new product lead for Defense-Wide Transmission Systems (DWTS) during a change of charter ceremony Oct. 28, 2016, at Fort Belvoir. **Col. Charles Stein**, center, project manager for Defense Communications and Army Transmission Systems, which includes DWTS, presided over the transition from acting Product Lead **Patrick Barnette**, left, who will resume his role as deputy.

Muller most recently served as the product lead for the Installation Information Infrastructure Modernization Program, also within PEO EIS. As the product lead for DWTS, he will be responsible for life cycle management of terrestrial and satellite communication programs, including the Combat Service Support (CSS) Automated Information Systems Interface, the CSS SATCOM Very Small Aperture Terminal and the Terrestrial Transmissions programs. (Photo by Linda Valenzano)

2: NEW PRODUCT LEAD AT I3MP

Brendan Burke, right, was named the product lead for the Installation Information Infrastructure Modernization Program during a change of charter ceremony Oct. 7, 2016, at Fort Belvoir. **Michael Padden**, center, the project manager for installation information infrastructure communications and capabilities, hosted the ceremony, transitioning the charter from outgoing product lead **Lt. Col. August "Gus" Muller**, left.

Burke most recently served in PEO EIS as the product lead for GFEBS Increment II. He also worked in PEO EIS as the project director for Computer Hardware, Enterprise Software and Solutions. Burke began his civil service career as a contracting officer with U.S. Army Communications-Electronics Command. Previously he was a commissioned officer in the Air Force, serving in various contracting positions. (Photo by Racquel Lockett-Finch, PEO EIS)

U.S. ARMY SECURITY ASSISTANCE COMMAND (USASAC)

3: NEW LEADERSHIP AT OPM-SANG

Brig. Gen. Frank M. Muth assumed the title of program manager for the Office of the Program Manager – Saudi Arabian National Guard (OPM-SANG) during a change of charter ceremony July 14, 2016, in Riyadh, Saudi Arabia. The ceremony was hosted by **Gen. Dennis L. Via**, then CG of the AMC. OPM-SANG is a subordinate organization of USASAC, which executes the Army's security assistance and foreign military sales program. USASAC is, in turn, a subordinate command of AMC.

Before joining OPM-SANG, Muth was director of the Army Quadrennial Defense Review Office in the Office of the Deputy Chief of Staff, G-8, at the Pentagon. He takes over from **Brig. Gen. Paul Laughlin**, who retired after a 31-year career that included armor, DOD command and Middle East assignments.

4: CHANGE OF RESPONSIBILITY

The U.S. Army Security Assistance Training Management Organization (USASATMO) welcomed **Command Sgt. Maj. Michael J. Lamkins** during a change of responsibility ceremony Aug. 26, 2016, at Fort Bragg, North Carolina. The ceremony was officiated by **Col. Gerald Boston**, the commander of USASATMO, a subordinate organization of USASAC.

Lamkins previously served as the command sergeant major for 3rd Squadron, 73rd Cavalry Regiment of the 1st Brigade Combat Team, 82nd Airborne Division at Fort Bragg. He replaces **Command Sgt. Maj. Brian A. Hester**, who went on to serve as the command sergeant major of the Office of Security Cooperation – Iraq.

U.S. ARMY MEDICAL RESEARCH AND MATERIEL COMMAND

ARMY MEDICAL LOGISTICS HONORED

Maj. Gen. Barbara R. Holcomb, left, CG of the U.S. Army Medical Research and Materiel Command (USAMRMC) and Fort Detrick, Maryland, and chief U.S. Army Nurse Corps, and U.S. Army Medical Department Civilian Corps Chief **Gregg Stevens**, third from left, join the USAMRMC Total Lifecycle Management Team to present the team with the Army Medicine Wolf Pack Award for the fourth quarter of FY16, during a ceremony Oct. 11, 2016, presided by **Army Surgeon General Lt. Gen. Nadja Y. West** at Fort Detrick.

The Wolf Pack Award recognizes an integrated team of military and civilian members whose accomplishments demonstrate excellence and effective teamwork resulting in significant products or services with the potential for broad impact in support of Army medicine. The Total Lifecycle Management team comprises 20 military and civilian employees from the U.S. Army Medical Materiel Agency (USAMMA) and the U.S. Army Medical Materiel Development Activity (USAMMDA), both subordinate organizations of USAMRMC.

"I just want to thank everyone who is on the team and the other folks at USAMMA for this award because without everyone, we would not be here," said **Linda Foltz**, director of the USAMMA Force Projection Directorate. "The improvements that we have made we will continue to utilize throughout all of our programs." (Photo by Carey Phillips, USAMMDA Public Affairs)

GENERAL OFFICER ANNOUNCEMENTS

The chief of staff, Army, announces the following officer assignments:

Brig. Gen. (P) Robert L. Marion, PEO for Aviation, Redstone Arsenal, to deputy for acquisition and systems management, Office of the ASA(ALT), Washington, D.C.

Brig. Gen. Patrick W. Burden, deputy PEO for Ammunition and senior commander of Picatinny Arsenal, to PEO for Enterprise Information Systems, Fort Belvoir.

Brig. Gen. Thomas H. Todd III, deputy CG, U.S. Army Research, Development and Engineering Command (RDECOM), APG, and senior commander, Natick Soldier Systems Center, Natick, Massachusetts, to PEO for Aviation, Redstone Arsenal.

Col. (P) Anthony W. Potts, special assistant to the PEO for Missiles and Space, Redstone Arsenal, to deputy CG, RDECOM and senior commander, Natick Soldier Systems Center. Potts was promoted to brigadier general, effective Nov. 2, 2016.

The following general officers were placed on the retired list:

Gen. Dennis L. Via completed more than 36 years of service, culminating as the CG, AMC, Redstone Arsenal.

Lt. Gen. Thomas W. Spoehr completed more than 36 years of service, culminating as director of the Office of Business Transformation, Office of the Undersecretary of the Army, Washington, D.C.

Maj. Gen. John F. Wharton completed more than 35 years of service, culminating as CG, RDECOM, APG.

THEN & NOW
1996 & 2016

SETTING a PACER for ACQUISITION

The seeds of the now-ubiquitous integrated product team took root some 20 years ago, producing a major shift in mindset and program management.

Everything has to start somewhere, and that includes the processes that underpin acquisition today. The integrated product team (IPT), now so prevalent in program offices, was a novel idea back in 1996, when Army AL&T's predecessor publication featured a success story from the U.S. Army Communications-Electronics Command (CECOM) about its use of a process called Pacer to speed fielding of vital communications equipment.

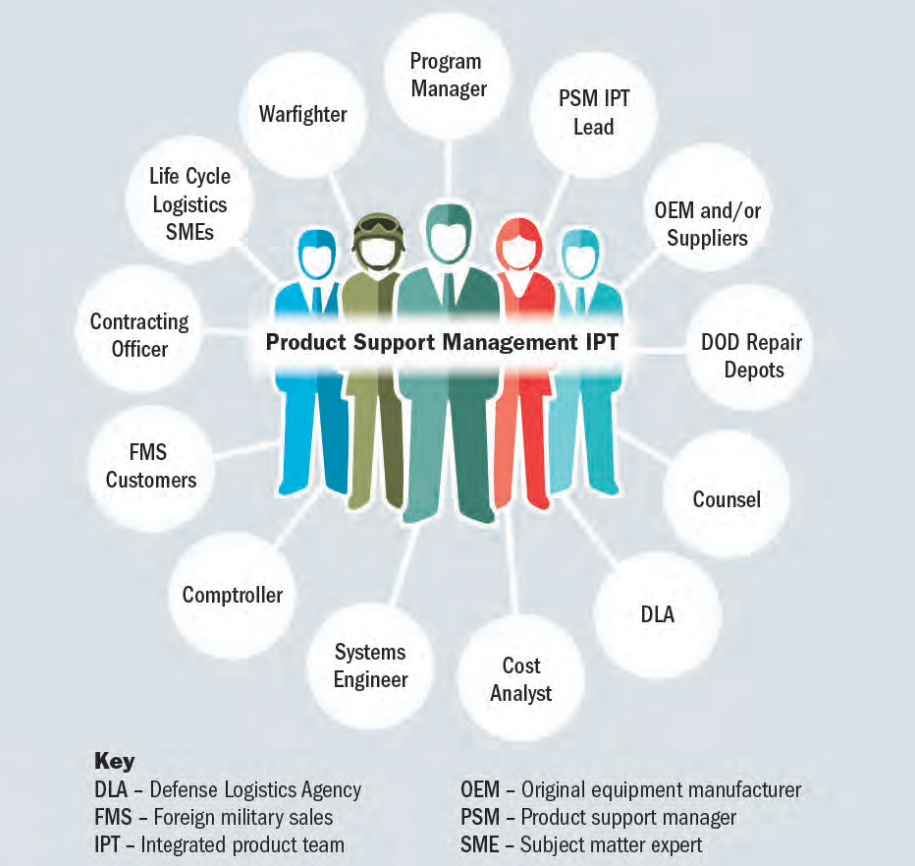
CECOM's approach was a response to Secretary of Defense William J. Perry's call for implementing the concepts of integrated product and process development "throughout the acquisition process to the maximum extent practicable." As part of his far-reaching push for acquisition reform, Perry stated in a May 10, 1995, memo, "I want all those involved in the acquisition process to employ these concepts for all acquisitions when it makes sense. The Department's oversight staffs shall fundamentally shift their roles from sequentially checking on a program beginning six months prior to a milestone decision point to participating early to facilitate program success through continuous teamwork and assistance throughout the acquisition process."

Looking back, the IPT "is one of, if not the most, innovative approaches adopted in acquisition in my career," said Dr. Owen Gadeken, a professor at Defense Acquisition University with 40 years of

experience in the field. "The fact that we're still using it is proof of the concept."

Before IPTs, the contracting process was sequential—first it went to the budget guys, then to engineering, and so on—and time-consuming, Gadeken said. "With an IPT, we put people in a room, shut the door and say, 'Look: We're not going to leave until everyone is working toward a common goal.' "

Initially, the IPT concept represented a big cultural shift, eliminating functional stovepipes and changing the focus of the oversight function—HQDA, for example—from one of critique to one of approval. Perry's nearly three-year tenure as defense secretary, from February 1994 to January 1997, was an important factor in the successful adoption of the concept. While other initiatives often die off when the people behind them move to another role, the IPT concept benefited from Perry's continuity in office. "The people he picked to be the next acquisition leaders, including Gil Decker, were fully on board, too," Gadeken noted. Gilbert F. Decker was the Army acquisition executive during Perry's leadership of DOD.



MAKING THE TEAM

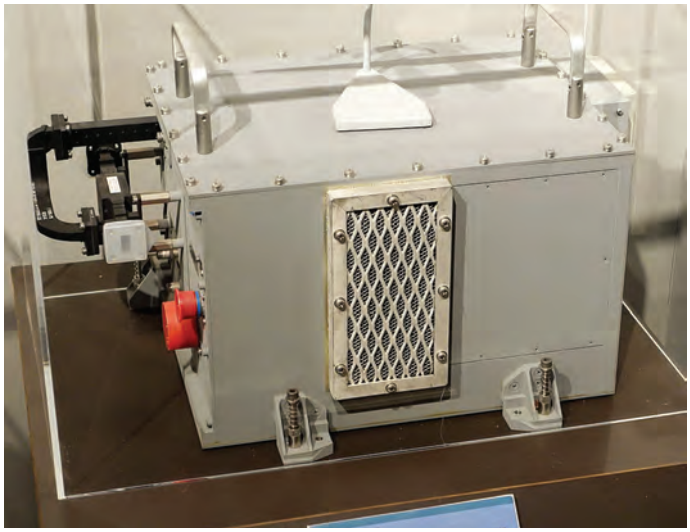
An IPT, used in complex development programs and projects, comprises representatives from appropriate functional disciplines working together to build successful programs; identify and resolve issues; and make sound and timely recommendations to facilitate decision-making. The emphasis of the IPT is on involving all stakeholders—users, customers, management, developers, contractors and others—in a collaborative forum. (SOURCE: Defense Acquisition University)

SPEEDING THE PROCESS

CECOM used what it called "the Pacer approach" to complete rapid procurement and fielding for three systems, starting with the Super High Frequency Tri-Band Tactical Satellite Terminal, primarily a systems integration effort, and the Tactical Endurance Synthetic Aperture Radar (TESAR), an advanced concept technology demonstration. It also used the approach successfully for Applique, a computer-based research and development acquisition. A contract for six Tri-Band systems was awarded in just 72 days—a dramatic difference from the typical 270 days. For TESAR, it took just 60 days to award a contract, and the team cut processing time by 60 percent after eliminating documents and reviews that added no value to the acquisition.

The CECOM teams operated under a "no business as usual" policy: The IPT questioned all actions and requests, which had to be justified and defended before approval. IPT members worked simultaneously in collaboration—not serially, each within a separate function—to develop the absolute minimum for essential requirements, eliminating those with no added value, and incorporated industry as a partner early in the process. Additionally, the program managers for each effort worked to keep their teams together through all phases of the acquisition, ensuring continuity and easing transitions from one phase to the next.

CECOM cited several keys to its success with these acquisitions: teamwork, participation and what was then prosaically referred to as "electronic commerce"—an electronic bulletin board that facilitated real-time communication. (Imagine the possibilities.)



EARLY SUCCESS

One of the first systems for which CECOM used its Pacer approach was TESAR, an advanced concept technology demonstration by Northrop Grumman Corp. This is a 1996 mock-up. (Photo courtesy of National Electronics Museum)

MAKING AN IPT EFFECTIVE

These days, everyone and his brother is part of an IPT, for good reason: They work pretty well. "There isn't a single program that doesn't have one in place," said Gadeken, who put the number of defense acquisition IPTs in the thousands. While initially envisioned for use with system acquisitions, the IPT concept also has proven effective for service contracts, which weren't as prevalent when Perry issued his directive as they are today. The Army's recent decision to expand its rapid acquisition cells into the Army Rapid Capabilities Office is further evidence that IPTs are effective, especially in getting equipment to the field quickly and cheaply, Gadeken noted.

Effective IPTs share two characteristics, he said: cooperation and empowerment. Team members have to be able to make decisions to help the team move forward and then back-brief others who aren't on the team. "What you don't want are people who are just note takers for senior management." Also detrimental, said Gadeken, "are team members interested in protecting their turf—that just leads to a lot of counterproductive squabbling."

Implementation of IPTs prompted changes in the way program managers operate—less command and control and more coalescence, said Gadeken. "There's no more 'follow me up that hill.' Instead, it's, 'Let's see if we can get our interests out on the table and get rid of any hidden agendas. And when we sign off on our goal, I want everyone to support it.' It sounds easy, but it's hard to get right. And it requires teams of people willing to subvert their individual functional goals and make compromises."

He noted that there's little difference between the Pacer approach that CECOM rolled out 20 years ago and the IPTs in place today. The process isn't perfect, though. "One of the regrets is that we haven't been able to take some of those streamlining effects and broaden them out to our larger, higher-dollar-value programs," Gadeken noted.

Also, Perry's concept for IPTs assumed that teams were staffed with capable people across all functional areas. "In some places, we're short," Gadeken said. Limited billets and the difficulty of competing with private industry, as well as downsizing efforts and hiring freezes, have led to personnel shortages in systems engineering and systems safety, among other areas.

Continued success of the IPT approach hinges in part on developing the next generation of decision-makers. Recruitment, training and development are necessary to ensure that "we have capable people with good functional expertise sitting in the chairs around the table," Gadeken said.

Another factor in future success is leadership. "The IPT leader can make or break the effectiveness of the IPT," Gadeken said. Since most of the IPT members come from organizations other than the leader's, he explained, "the effective IPT leader will usually have a collaborative style, rather than a directive one, [and] knows how to engage the different team members to bring out their best contributions. Effective IPT leaders are great team builders and great coaches."

To read the Army RD&A article "Pacer Acquisitions: DOD Vision Becomes a Reality at CECOM," go to ***http://asc.army.mil/docs/pubs/alt/archives/1996/Jan-Feb_1996.PDF****. For a historical tour of Army AL&T over the past 56 years, go to the Army AL&T archives at* ***http://asc.army.mil/web/magazine/alt-magazine-archive/****.*

—MR. ROBERT E. COULTAS and MS. SUSAN L. FOLLETT

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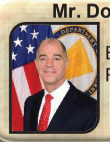
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"In the broadest context, 'strategy' means examining the status quo, measuring the gap between that and the desired end state, and identifying the path to achieve that goal. 'Strategic acquisition,' then, leads us to embrace the changes of acquisition reform and continue to build toward the most affordable and efficient processes to field capability. It is the business of making acquisition more efficient, more economical and more sensible."

Ms. Steffanie B. Easter
Senior Official Performing the Duties of the Assistant Secretary of the Army for Acquisition, Logistics and Technology
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