

Future Outlook Released for Remotely Piloted Aircraft

AIR FORCE PUBLIC AFFAIRS AGENCY (APRIL 4, 2014)

Air Force Staff Sgt. Carlin Leslie

WASHINGTON—Air Force leaders outlined what the next 25 years for remotely piloted aircraft will look like in the RPA Vector, published April 4.

“The RPA Vector is the Air Force’s vision for the next 25 years for remotely-piloted aircraft,” said Col. Kenneth Callahan, the RPA capabilities division director. “It shows the current state of the program, the great advances of where we have been and the vision of where we are going.”

The goal for the vector on the operational side is to continue the legacy airmen created in the RPA field. The vector is also designed to expand upon leaps in technology and changes the airmen have made through the early years of the program.

“The airmen have made it all about supporting the men and women on the ground,” Callahan said. “I couldn’t be more proud of them for their own advances in technology to expand the program, making it a top platform.”

The document gives private corporations an outlook on the capabilities the Air Force wants to have in the future, ranging from creation of new RPAs to possibilities of automated refueling systems.

“There is so much more that can be done with RPAs,” said Col. Sean Harrington, an intelligence, surveillance, and reconnaissance command and control requirements chief. “Their roles [RPAs] within the Air Force are evolving. We have been able to modify RPAs as a plug-and-play capability while looking to expand those opportunities.”

In recent years, RPAs not only supported the warfighter on the ground, they also played a vital role in humanitarian missions around the world. They provided real time imagery and video after the earthquake that led to a tsunami in Japan in 2011 and the earthquake in Haiti in 2010, according to Callahan.

Then, most recently, during the California Rim Fire in August 2013, more than 160,000 acres of land were destroyed. Though this loss was significant, it was substantially decreased by the support of the California Air National Guard’s 163rd Reconnaissance Wing, with support from an MQ-1 Predator, a remotely piloted aircraft.

With this vector, technologies may be created to improve those capabilities while supporting different humanitarian

efforts, allowing the Air Force to support natural disaster events more effectively and timely.

The future of the Air Force’s RPA programs will be continuously evolving, to allow the Air Force to be the leader in Air, Space, and Cyberspace.

“We already combine our air, space, and cyber forces to maximize these enduring contributions, but the way we execute must continually evolve as we strive to increase our asymmetric advantage,” said Gen. Mark Welsh, the Air Force chief of staff. “Our airmen’s ability to rethink the battle while incorporating new technologies will improve the varied ways our Air Force accomplishes its missions.”

For more information and to view the remotely piloted aircraft vector, visit <http://www.af.mil/Portals/1/documents/news/USAFRPAVectorVisionandEnablingConcepts2013-2038.pdf>.

DoD Officials Update Congress on Nuclear Weapons Program

AMERICAN FORCES PRESS SERVICE (APRIL 9, 2014)

Karen Parrish

WASHINGTON—The United States should press on with cutting nuclear stockpiles under the New START treaty with Russia, even as U.S. and NATO planners must reconsider their options following Russian aggression in the Ukraine, Pentagon experts told Congress yesterday.

Andrew C. Weber, assistant secretary of defense for nuclear, chemical and biological defense programs, testified as part of a panel of witnesses before the House Armed Services Committee’s strategic forces subcommittee on fiscal year 2015 atomic energy defense and nuclear forces. Elaine Bunn, deputy assistant secretary of defense for nuclear and missile defense policy, also testified.

Weber said the 2015 budget request for Defense Department nuclear forces programs would support DoD and Energy Department efforts to modernize and sustain “a safe, secure, and effective nuclear weapons stockpile.”

However, “stark budget realities continue to stress our efforts to update an aging stockpile and infrastructure,” he cautioned the subcommittee. During January visits accompanying Defense Secretary Chuck Hagel to nuclear and research laboratories, Weber said, he heard Hagel emphasize while speaking with the nuclear workforce “that we are going to invest in the modernization required to maintain an effective deterrent.”

The department's most vital modernization efforts include life-extension programs for the W76-1 submarine-launched ballistic missile warhead and the B61-12 gravity bomb, Weber said. The W76 was manufactured from 1978 to 1987, and the B61 reached full production in 1968.

Life-extension programs repair or replace components of nuclear weapons to meet military requirements. According to National Nuclear Security Administration officials, extending the time that a weapon can safely and reliably remain in the stockpile helps to maintain a credible nuclear deterrent without producing new weapons or conducting new underground nuclear tests.

"The B61 life-extension program, which [Chairman of the Joint Chiefs of Staff Army Gen. Martin E. Dempsey] referred to as 'a bright note' is currently undergoing development engineering, and prototypes are being assembled for early testing," Weber said.

"Due to sequestration impacts, the schedule for first production has been revised to the second quarter of 2020," he said. "This will just—with emphasis on just—meet U.S. Strategic Command and NATO operational requirements."

The B61-12 program, Weber said, will replace the four current models of the bomb with one, and "enable the retirement of the B83, the last megaton bomb in the stockpile."

Stable funding for the B61 life-extension program is necessary to keeping the B2 strategic bomber viable and to maintaining U.S. commitments to NATO allies, Weber told subcommittee members.

"The world is safer today from the threat of full-scale nuclear war than it was during the Cold War," he said. "While the role and numbers of [nuclear] weapons are being reduced, maintaining a safe, secure, and effective nuclear stockpile is critical to deterring potential adversaries and assuring U.S. allies and partners. We ask for your support for the president's fiscal year 2015 budget request."

Bunn's opening remarks yesterday followed Weber's, and she zeroed in on Russia after telling members she meant to go beyond her prepared statement.

"Russia's unexpected and dangerous aggression in Ukraine, in violation of international law, compels us to revisit our expectations about future Russian behavior and to reassess a number of U.S. and NATO policies [on Russia]," she said.

But two national policies will remain unchanged, she noted: "First, strengthening NATO's collective defense."

NATO is seeking "all options" to build collective defense capacity among member nations through expanded defense plans, exercises, and deployments, she noted.

Second, Bunn told committee members, "this administration, like its predecessors, has sought a stable, strategic nuclear relationship with Russia—especially during times of turbulence elsewhere in the relationship."

"We will continue to implement the New START treaty ratified by the Senate in December 2010 ... because it's in our national interest," she said. "The inspections and notifications under the treaty give us a window into Russian strategic forces and limits them for the duration of the treaty."

Bunn outlined the department's plan, announced yesterday, for its strategic nuclear force structure under the New START limits. The new limits will take effect by February 2018, and will maintain the U.S. nuclear triad of sea-, land-, and air-based nuclear delivery platforms.

"Our 700 deployed strategic forces will look like this: 400 deployed [intercontinental ballistic missiles], 240 deployed [submarine-launched ballistic missiles], and 60 deployed nuclear-capable heavy bombers," she said.

The United States also will maintain 100 nondeployed launchers and bombers, Bunn said, including 54 ICBM launchers backed by 50 "warm" ICBM silos—which she described as "empty, but still functional"—40 submarine launch tubes and six bombers.

The structure provides "flexibility, survivability, [and] responsiveness of our nuclear forces," she said, and ensures "an array of options is available under a broad range of scenarios."

Bunn noted the plan preserves a "just-in-case upload capability" for each leg of the triad.

Returning to the subject of Russia, the policy chief said Moscow seems as determined as Washington is "to preserve the strategic nuclear stability embodied in the New START treaty."



Air Force Lt. Gen. Charles R. Davis and Navy Vice Adm. Paul A. Grosklags talk prior to a hearing April 8, 2014, before the Senate Subcommittee on Air and Land in Washington, D.C. Witnesses from other Services who testified included Air Force Lt. Gen. Christopher C. Bogden, Program Executive officer, F-35 Lightning II Joint Program Office; and Marine Corps Lt. Gen. Robert E. Schmidle Jr., Deputy Commandant for Aviation. Davis is the Military Deputy to the Assistant Secretary of the Air Force for Acquisition and Grosklags is the Principal Military Deputy to the Assistant Secretary of the Navy for Research, Development and Acquisition.

U.S. Air Force photo/Scott M. Ash

F-35 On Time to Replace Previous Tactical Aircraft

AIR FORCE PUBLIC AFFAIRS AGENCY OPERATING LOCATION-PENTAGON (APRIL 10, 2014)

Air Force Staff Sgt. Torri Ingalsbe

WASHINGTON—The F-35 Lightning II will enhance combat capabilities, project U.S. power, and deter potential adversaries, Air Force officials told members of the Senate Armed Services Committee's subcommittee on tactical air and land forces in a hearing on tactical aircraft programs there, April 8.

"The F-35 will form the backbone of U.S. air combat superiority for generations to come," said Lt. Gen. Christopher Bogdan, the F-35 Lightning II Joint Program Office executive officer. "It will replace the legacy tactical fighter fleets of the Air Force, Navy, and Marine Corps with a dominant, multirole, fifth-generation aircraft."

The fighter jet is scheduled to be at Marine bases in the summer of 2015, with the Air Force receiving aircraft the following summer, officials said.

"It takes the combined efforts of all of our military services and the whole of the government to deny, deter, and defeat an enemy," said Lt. Gen. Charles Davis, the military deputy to the assistant secretary of the Air Force for acquisition. "The Air Force is an active partner in Department of Defense planning that will shift our emphasis from today's wars to a broader range of challenges and opportunities."

The hearing also included testimonies from Vice Adm. Paul Grosklags, the principal military deputy to the assistant secretary of the Navy for research, development and acquisition; and Lt. Gen. Robert Schmidle Jr., the Marine Corps deputy commandant for aviation.

All men agreed the way of the future is the F-35, especially with its technological advances and enhanced operating capabilities.

"My team is focused and committed to doing the very best we can for the warfighters, taxpayers, and our partners to ensure that the F-35 meets the needs of all our nation's defenses," Bogdan said. "To that end, my team is rising to the challenge of managing this very large, complex program with

integrity, transparency, accountability, and discipline to ensure that we develop and deliver the warfighting capability this country needs and expects.”

Bogdan noted budget constraints, and told the committee affordability remains his top priority for this aircraft.

Davis added maintaining balance between force structure, readiness, and modernization has been a guiding principle in future planning.

“Our chief [of Staff] and our Secretary [of the Air Force] have been very clear that there are some enduring capabilities your United States Air Force provides, and these are missions they are expected to perform at any time, on any given day,” Davis said. “We have a very challenging situation as we go forward. There are no easy choices; there are some choices that are easier than others that will provide the enduring capabilities the United States expects the United States Air Force to provide.

DoD Seeks Efficiencies in Sustainment, Logistics

AMERICAN FORCES PRESS SERVICE (APRIL 15, 2014)

Claudette Roulo

WASHINGTON—When the Defense Department is looking to save money, it turns to sustainment and logistics, the undersecretary of defense for acquisition, technology and logistics said today.

“If you want to really address the issues that DoD has with efficiency and affordability, you definitely have to look at the sustainment [and] logistics side of the house, because that is ... where the money is,” Frank Kendall said at the 2014 National Defense Industrial Association logistics forum.

The existing budget environment probably is one of the worst he’s ever seen, the undersecretary said. Kendall served in the Army during the 1970s—the era of the hollow force, he said—but “2013 will go down in my memory as one of the most unpleasant years I’ve gone through.”

Furloughs, sequestration, the government shutdown, budget uncertainties, readiness problems, and difficulty sustaining the pace of production and development programs served to make it a “nightmare year,” Kendall said.

“Sometime last summer, somebody said to me, ‘Well, Frank, at least you were here for the good years’ ... I think back on it now, [and] 2010-2011 seem like pretty damn good years, comparatively,” he said.

With the Bipartisan Budget Act of 2013, stability returned to the defense budget—at least for the short term, Kendall said. “But we’re still sitting here with the Sword of Damocles hanging over our heads,” he added.

Sequestration will return in fiscal year 2016 if Congress doesn’t act, the undersecretary said, noting that it was never actually intended to happen in the first place.

“The idea of sequestration was that it would be so horrible that this [congressional] committee would feel compelled to come out with an agreement,” Kendall said.

Sequestration generally was expected to be in place for two to three months, he said. “It was not intended to be a budget-cutting mechanism,” the undersecretary noted.

“There’s a perception that the department cried wolf about sequestration,” Kendall said. “I was very vocal in my confirmation hearing for undersecretary. I said some strong things about the implications of sequestration. I believe they were accurate.”

But, he said, “the cuts of sequestration were so widely distributed that there were no dramatic, immediate events that got everybody’s attention.”

Instead, it became death by a thousand cuts, the undersecretary said. “The biggest single impact was probably on readiness—on the readiness of our forces, on their training, on their ability to maintain their equipment, on the logistics side of our business, basically.

“That was not highly visible,” he continued. “The fact that people couldn’t go out and do training, the fact that people did not have parts ... was not highly visible.”

And now sequestration is grimly accepted as the status quo, Kendall said, reiterating that it never was intended to be that way.

The Defense Department has looked at what it will be like if sequestration were to continue, he said. “It’s pretty unpleasant,” the undersecretary told the conference audience, adding that it puts the department at a level of funding that will not allow it to execute the president’s defense strategy.

“We’re trying to figure out how to manage our way through this,” Kendall said. “One of the greatest problems with the sequestration mechanism and the uncertainty we face is ... we can’t plan.”

The department has tried to act as if the uncertainty will go away, he said, but the problem with that is sequestration is a 10-year law.

"It doesn't go away unless Congress does something to take it away, and I don't see any political prospect of that any time soon," he said. "Whatever happens in the election coming up, I think we're going to be in the same position. ... Meanwhile, we have to live our lives and do our jobs in this environment."

So, he said, the department has to learn to manage its way through the uncertainty, probably for an indefinite period of time. But recognizing this fact allows the department to plan for the risk of receiving a lower budget than it requested, the undersecretary said.

Kendall said several things in the current fiscal environment worry him:

- The potential for creating a hollow force by underfunding training and maintenance;
- Cuts to funding for modernization and research and development;
- The health of the civilian workforce; and
- The health of the industrial base—from top to bottom, products to services.

To mitigate these risks, the initiatives outlined in Better Buying Power 2.0 are where the department can look to save the most money, Kendall said.

"Should-cost" is a fundamental initiative, he said, "and it's tightly coupled to the desire to change our culture a little bit."

The existing culture is one focused on spending all of the money in a project budget, Kendall said. "We're trying to change that to where it's a culture of cost control, where your job is to control your costs ... to get as much as you can for the money you've been given—improve your productivity, in other words."

Going hand in hand with controlling costs is avoiding spending money when it doesn't need to be spent, the undersecretary said. "There are always higher priority needs, so if you have funds that have been appropriated that we can use for something that's a higher priority, that's a good thing," he said.

Should-cost is about actively driving costs down, Kendall added. "It's about the idea that you don't just stay within your budget, because you understand your costs—under-

stand them deeply, look for opportunities to reduce your costs, and then act on that."

A second initiative is aimed at eliminating redundancy, he said. One way to do that is through commonality of parts, the undersecretary said. "We need to do a better job at that," he acknowledged.

Performance-based logistics will help to define performance in a way that's relevant to the operational community and then reward people for doing a better job, Kendall said. In part, he added, this can be done by using contract types that are appropriate to the project and properly written.

"Industry is very simple. It will respond to the incentives," the undersecretary said.

The need to remove layers of bureaucracy transcends the logistics community, Kendall said. "Bureaucracies tend to grow," he said. "In a bureaucracy, people tend to generate work for each other that may or may not have real value."

Effective competition across the board is absolutely the best way for the department to reduce costs, the undersecretary said.

While reduced budgets mean the department is doing fewer "new things," he continued, contractors shouldn't be complacent or comfortable that they've got the business forever. "We're not going to get the kind of leanness and efficiency that we need if people have that attitude," he said.

The immediate future isn't going to be any less stressful, Kendall said.

"I don't predict an easy time," he said. I think this is a temporary situation, however." He noted that defense budgets are cyclical.

"We're in a downturn right now," he said. "It'll end, and we'll go back up."

Smarter Spending for Air Force Acquisition

AIR FORCE PUBLIC AFFAIRS AGENCY OPERATING LOCATION-PENTAGON (APRIL 17, 2014)

Air Force Staff Sgt. Torri Ingalsbe

WASHINGTON—Finding efficiencies within the acquisition process was the top talking point for Maj. Gen. Wendy Masiello, deputy assistant secretary for contracting, when she spoke with members of the Air Force Association and the media during the AFA's monthly breakfast April 16, 2014, in Arlington, Va.



Air Force Maj. Gen. Wendy Masiello briefs attendees April 16, 2014, on how today's budget environment is driving change for both government and industry as part of the Air Force Association breakfast series in Arlington, Va. She noted challenges and opportunities to find savings still exist within the acquisition arena, particularly the supply chain management portion Masiello is the deputy assistant secretary for contracting. U.S. Air Force photo/Air Force Staff Sgt. Carlin Leslie

“Our industry partners have been hearing that we are struggling budget-wise,” Masiello said. “The dollars are going down, and we need to work together to reduce the cost of the programs in the future so we can continue to afford the programs we already have in place.”

She said there have been great examples recently in better buying power practices, especially in the reduction of overhead costs and “cleaning up” the proposal processes.

“If there is one thing that can help us shrink our acquisition timeline, it’s to get those proposals right in the beginning,” she explained.

Masiello noted challenges and opportunities to find savings still exist within the acquisition arena, particularly the supply chain management portion.

“There may be additional opportunities to find improvements in costs, and make sure that [the prime contractors] are truly getting the quality of work at the price we should be paying for that work from some of their suppliers,” she said.

Masiello briefed the audience on the top five priorities of the assistant secretary of the Air Force for acquisition as a way ahead for more responsible and efficient spending, to include: staying focused on the high-priority programs and keeping them on track; improving relationships and transparency with partners and stakeholders to include Congress and industry; owning the technical baseline for important programs; focusing on the better buying practices that will have the biggest payoff; and focusing on what technology means in building the Air Force for 2023 and beyond.

Masiello said these are the key things Air Force acquisition experts are targeting to save dollars and continue efficient operations under more constrained budgets.

“It’s our job to be responsible [to the tax payers] in managing those taxes and where we spend our money in the long run,” Masiello said.

Acquisition Community Works to Improve Tradecraft
AMERICAN FORCES PRESS SERVICE (APRIL 17, 2014)

Jim Garamone

WASHINGTON—Everything the defense acquisition community is doing now is being done to improve its “tradecraft,”

Katrina G. McFarland, the assistant secretary of defense for acquisition said yesterday.

McFarland made the comments at the National Defense Industrial Association's National Logistics Forum.

Improving tradecraft is something DoD would want to do in the best of times, she said, but the added pressures of budget constraints make this even more crucial to the nation.

"Every facet of our business practice ties together," she told the National Defense Industrial Association's National Logistics Forum.

The attention cannot be on one segment of operation in the acquisition process, but the whole gamut, the assistant secretary said.

The acquisition field now builds on the process of continuous improvement put forth in the Better Buying Power program. McFarland expects a Better Buying Power 3.0 to launch soon.

"The intent is basically to have people think about costs when they are applying logic to design, manufacturing, sustainment—whatever facet of acquisition there is.

"We will reward people who reduce costs with more profit," she said. "We're incentivizing to reduce costs. We want innovation that costs less.

"Our challenge is communicating that intent articulately and over the time of many years at war and conducting business that had to be done rapidly; we didn't necessarily spend enough time on the tradecraft of skillfully crafting a good deal," she continued. "And that's where we are trying to make changes."

The acquisition community is continuing down this path because it is working. Even with budget uncertainties, there have been demonstrable savings, McFarland said. Following the tenets of the Better Buying Power program, having conversations with industry partners, and making training available to acquisition workers "has demonstrated improvements in our costs even as we downsize," she said. "This shows there is tradecraft we can measure."

Results from the changes don't happen overnight, she said. In the military, when a Service introduces or changes a military job, the "turn" is about four years," she said. Using this as a rough measure, the acquisition workforce is seeing

change and the "turn" is starting to bear fruit. She expects this to speed up in the future.

Department of Defense Selected Acquisition Reports (SAR) (As of December 31, 2013)

DEPARTMENT OF DEFENSE NEWS RELEASE (APRIL 17, 2014)

The Department of Defense has released details on major defense acquisition program cost, schedule, and performance changes since the December 2012 reporting period. This information is based on the Selected Acquisition Reports submitted to the Congress for the December 2013 reporting period.

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

The total program cost estimates provided in the SARs include research and development, procurement, military construction, and acquisition-related operations and maintenance. Total program costs reflect actual costs to date as well as future anticipated costs. All estimates are shown in fully inflated then-year dollars.

The current estimate of program acquisition costs for programs covered by SARs for the prior reporting period (December 2012) was \$1,660,983.3 million. Final reports submitted for the annual December 2012 and for the June 2013 and September 2013 quarterly exception reporting periods were subtracted. Initial reports for the annual December 2012 and for the June 2013 and September 2013 quarterly exception reporting periods were added. Finally, the net cost changes for the June 2013 and September 2013 quarterly exception reporting periods were incorporated. View the SAR Summary Tables at http://www.defense.gov/pubs/SAR_SUMMARY_TABLES_FINAL.pdf.

Acquisition Process Challenges Leaders Advancing Rapid Transfer Technology to the Fleet

SPACE AND NAVAL WARFARE SYSTEMS COMMAND PUBLIC AFFAIRS (APRIL 23, 2014)

Tina C. Stillions

SAN DIEGO—Senior leaders from the Space and Naval Warfare Systems Command (SPAWAR) joined panel moderator Deputy Assistant Secretary of the Navy Dr. John Zangardi for discussions on rapidly advancing global Information

Dominance technology across the fleet at the 2014 AFCEA San Diego C4ISR Symposium, April 22.

Victor Gavin, program executive officer for Enterprise Information Systems, stressed the importance of leveraging industry capability to help bridge the gap as Navy investment and budgets in research and development (R&D) decline.

"Comparing the buying of ships to IT [information technology] won't work," said Gavin. "Our challenge is in determining how to take advantage of investments already out there in the commercial world and applying them to our environment."

Most of the panel's participants agreed the Navy lags behind major commercial enterprises, such as Intel and Qualcomm, in innovation technology investment, with acquisition bureaucracy and budget shortfalls convoluting much of the effort.

SPAWAR's Executive Assistant, Capt. D.J. LeGoff, said the current process supports the rapid transfer of technology to the fleet, but the evaluation process gets in the way and bogs it down.

"Yes, our processes do support the rapid introduction of capability to the fleet," said LeGoff. "But there are some forces that keep us from taking advantage of that flexibility. Those forces are process bureaucracy and budget bureaucracy."

It is estimated that DoD will spend approximately \$63 billion on research, development, test and evaluation (RDT&E) in the coming year. That amount equates to approximately \$36 billion less than the amount spent on procurement in 2014. With the ever increasing pace of current technology, major Navy information technology investments cannot keep up. Today's procurement process, designed for the acquisition of platforms like ships and aircraft, slows the transfer of important Information Dominance capability to the warfighter, with some programs taking upwards of five years to reach significant milestones toward implementation across the fleet.

Priority investment decision making is essential and a capable workforce vital to keep the warfighter from engaging in what is called "an unfair fight," said Capt. Kurt Rothenhaus, commanding officer, SPAWAR Systems Center Pacific. Meeting the Navy's R&D needs in the current austere budget climate are challenging, while at the same time maintaining existing systems, modernizing and introducing new technology.

"We approach agility and acquisition by providing domain-experienced engineers, scientists, and other professionals to solve maritime, C4I, cyber, and other technical challenges," said Rothenhaus. "Our strength is our ability to rapidly move folks around to where the work is needed and the priorities are. We work hand-in-hand with industry to meet that mission."

Zangardi summed it up by concurring that the process and the budget are part of the problem.

"It takes a lot of heavy lifting at the top to make it all work. I want to echo what was said: it is the process; it is the budget. Those are the things that make it very difficult," said Zangardi. "When we want to move faster, it takes guys like us to go in there and put a concerted leadership effort into it with our limited bandwidth to move things. It's not that we don't want to or that we're against it—it takes a lot to move it."

As the Navy's Information Dominance systems command, SPAWAR designs, develops, and deploys advanced communications and information capabilities for the warfighter. With nearly 10,000 acquisition professionals located around the world and close to the fleet, the organization is at the forefront of research, engineering, and support services that provide vital decision superiority for the warfighter.

For more information on SPAWAR, visit <http://www.public.navy.mil/spawar/Pages/default.aspx>. For more news from SPAWAR, visit: <http://www.navy.mil/local/spawar/>.

DARPA Officials Show Hagel Technologies Under Development

AMERICAN FORCES PRESS SERVICE (APRIL 23, 2014, From a Pool Report)

WASHINGTON—Defense Advanced Research Projects Agency program personnel demonstrated to Defense Secretary Chuck Hagel five technologies under development in the secretary's conference room yesterday.

DARPA Director Arati Prabhakar provided the secretary with a demonstration of the agency's latest prosthetics technology.

The wounded warrior demonstrating the device was Fred Downs Jr., an old friend of Hagel's who lost an arm in a landmine explosion while fighting in Vietnam. "He and I worked together many years ago," said Hagel, who earned two Purple Hearts during his service as an enlisted soldier in Vietnam.



Arati Prabhakar, director of the Defense Advanced Research Projects Agency, briefs Defense Secretary Chuck Hagel on the Atlas robot and other robotics at the Pentagon, April 22, 2014. The program showcased DARPA technologies and how they contribute to U.S. national security.
DoD photo by Marine Corps Sgt. Aaron Hostutler

Downs demonstrated how he controls movements of the arm, which appeared to be partly covered in translucent white plastic, with two accelerometers strapped to his feet. Through a combination of foot movements, he's able to control the elbow, wrist, and fingers in a variety of movements, including the "thumbs-up" sign he gave Hagel.

It took only a few hours to learn to control the arm, Downs said.

"It's the first time in 45 years, since Vietnam, I'm able to use my left hand, which was a very emotional time," he said.

Dr. Justin Sanchez, a medical doctor and program manager at DARPA who works with prosthetics and brain-related technology, told Hagel that DARPA's arm is designed to mimic the shape, size, and weight of a human arm. It's modular too, so it can replace a lost hand, lower arm, or a complete arm.

Hagel said such technology would have a major impact on the lives of injured troops.

"This is transformational," he said. "We've never seen anything like this before."

Next, Sanchez showed Hagel a video of a patient whose brain had been implanted with a sensor at the University of Pittsburgh, allowing her to control an arm with her thoughts.

Matt Johannes, an engineer from the Johns Hopkins University Applied Physics Laboratory, showed Hagel a shiny black hand and arm that responds to brain impulses. The next step is to put sensors in the fingers that can send sensations back to the brain.

"If you don't have line of sight on something you're trying to grab onto, you can use that sensory information to assist with that task," Johannes said.

The tactile feedback system should be operational within a few months, he said.

"People said it would be 50 years before we saw this technology in humans," Sanchez said. "We did it in a few years."

Next, officials gave Hagel an overview of the DARPA Robotic Challenge, a competition to develop a robot for rescue and disaster response that was inspired by the March 2011 Fukushima nuclear incident in Japan.

Virginia Tech University's entrant in the contest, the hulking 6-foot-2-inch Atlas robot developed by Boston Dynamics, stood in the background as Hagel was shown a video of robots walking over uneven ground and carrying things.

Brad Tousley, head of DARPA's Tactical Technology Office, explained to Hagel that Hollywood creates unrealistic expectations of robotic capability. In fact, he said, building human-like robots capable of autonomously doing things such as climbing ladders, opening doors, and carrying things requires major feats of engineering and computer science. Journalists were escorted out before the remaining three technologies could be demonstrated because of classified concerns. A defense official speaking on background told reporters that Hagel was brought up to date on the progress of three other DARPA programs:

- Plan X, a foundational cyberwarfare program to develop platforms for the Defense Department to plan for, con-

duct, and assess cyberwarfare in a manner similar to kinetic warfare.

- Persistent close air support—a system to, among other things, link up joint tactical air controllers with close air support aircraft using commercially available tablets.
- A long-range anti-ship missile, planned to reduce dependence on intelligence, surveillance and reconnaissance platforms; network links; and GPS navigation in electronic warfare environments. Autonomous guidance algorithms should allow the LRASM to use less-precise target cueing data to pinpoint specific targets in the contested domain, the official said. The program also focuses on innovative terminal survivability approaches and precision lethality in the face of advanced countermeasures.

Kendall: Fixing Acquisition Requires Incremental Improvement

AMERICAN FORCES PRESS SERVICE (APRIL 30, 2014)

Cheryl Pellerin

WASHINGTON—Improving defense acquisition is a long, hard, tedious job that demands attention to hundreds of factors, and the Defense Department is making continuous incremental improvement in areas where it can make the most progress, the Pentagon's acquisition chief told a Senate panel today.

Frank Kendall, undersecretary of defense for acquisition, technology and logistics, appeared before the Senate Armed Services Committee, which convened to assess the impact of the Weapon Systems Acquisition Reform Act of 2009, or WSARA, and other measures; and to consider the need for more legislative improvements to the defense acquisition system.

"The approach I am taking is one that Dr. [Ash] Carter and I decided upon four years ago when he was undersecretary and I was his principal deputy, when we introduced the first set of what we called Better Buying Power initiatives," Kendall told the panel.

Kendall described the Better Buying Power process as one of continuous, incremental improvement based on pragmatism, and evidence based on data.

"I could report to you today," he added, "that after four years, I believe we are seeing changes for the better."

Kendall said acquisition of a new cutting-edge weapon system is a complex job that takes getting every one of hundreds of decisions right in an environment where the real incentive systems are not always aligned with the goal of increased efficiency.

"This is particularly true in the current budgetary situation," he said. "There is great uncertainty about future budgets, and planning is excessively difficult."

The Better Buying Power approach tries to identify areas of acquisition where the greatest good can be achieved and to attack those opportunities, Kendall said. "As we learn from our experience, we periodically make adjustments and bring in new ideas," he added.

Kendall said his team is pursuing many initiatives under the second iteration of Better Buying Power, or BBP 2.0, and he told the Senate panel a third iteration is on the horizon.

It is a pragmatic, incremental approach that spans actions such as setting affordability caps to constrain program cost and developing "should-cost" estimates, as well as a focus on the professionalism of the department's acquisition workforce, the creation of competitive pressures wherever possible, and a new emphasis on the acquisition of services as opposed to products, he told the panel.

In written testimony, Kendall explained that should-cost-based management challenges every manager of contracted work to identify opportunities for cost reduction, to set targets to achieve those reductions, and to work vigorously to achieve them.

"Managers at all levels should be requiring that these steps be taken and rewarding successful realization of cost savings," he said. "I am seeing more of the desired behavior as time passes."

Kendall said there is work to do in teaching managers the craft of using should-cost for smaller programs, but that overall should-cost management "as a single measure alone, if fully implemented, will cause fundamental change in how we manage our funds."

BBP 2.0 moved Kendall and his team in an incremental way from the set of model rules that characterized BBP 1.0 to recognition that in the complex world of defense acquisition, critical thinking by well-informed and experienced acquisition professionals is the key to success, the undersecretary said.

"This is as equally true of the acquisition of contracted services for maintenance, facility support, information technology, or anything else we acquire from industry," he added, "as it is for the various aspects of the large programs that we normally associate with defense acquisition."

Kendall said BBP 2.0, labeled “A Guide to Help You Think,” is bookended by two critical areas—affordability and increasing the professionalism of the workforce, with middle sections on cost control, incentivizing industry, and increasing competition, among others.

“This is hard, detailed work,” he told the panel. “It takes time, constancy of purpose, and tenacity to be effective. But I don’t believe there is any other way to achieve lasting improvement.”

The undersecretary said he is working to implement important cultural changes embedded on multiple fronts in the process of continuous improvement.

The academic business literature suggests that two things are needed to effect major change in an organization—a period of four or five years of sustained commitment by senior leadership, and a crisis, Kendall observed.

“I’m trying to supply the leadership,” he said. “The budget situation is supplying the crisis.”

The first culture change would move the workforce from a culture that values spending over controlling cost, Kendall said.

“In government,” he said, “the built-in incentive system is to spend one’s budget so funds are not rescinded or reduced in subsequent budgets.” Many of the Better Buying Power initiatives are intended to reverse this situation and force managers to focus on costs, he added.

A second cultural change is to move the government workforce away from a check-the-box approach to acquisition, to one based on professionalism, sound business and technical analysis, and most of all, he said, critical thinking.

“I do believe we are making progress,” Kendall said, “but I also believe we have ample room for additional improvement. And with [the Senate Armed Services Committee’s] support, I am determined to build on the progress we’ve made.”

DoD Shows Science, Technology Success Despite Hard Year for Workforce

AMERICAN FORCES PRESS SERVICE (MAY 14, 2014)

Cheryl Pellerin

WASHINGTON—Despite a year of workforce furloughs and dwindling budgets, the Defense Department’s science and technology enterprise reports advances ranging from a full hypersonic weapon system and high-energy lasers to light-

based brain treatments and new core capabilities in cyber warfare, senior DoD officials told a Senate panel today.

Alan Shaffer, acting assistant secretary of defense for research and engineering, and Dr. Arati Prabhakar, director of the Defense Advanced Research Projects Agency, or DARPA, testified on defense research and innovation before the Senate Appropriations subcommittee on defense.

Shaffer told the panel the DoD workforce has produced remarkable achievements, but now shows signs of stress due to downsizing-furlough-shutdown challenges of the past year.

“These affected the health of our workforce and the programs they execute in ways we are just beginning to understand,” he said. “We have begun to address the challenges, but they remain a concern to us.”

The fiscal 2015 science and technology budget request is down about 5 percent, to \$11.5 billion compared to fiscal 2014’s \$12 billion request, Shaffer added.

“DoD tries to balance our program [but] there are factors that led Defense Secretary [Chuck] Hagel to conclude in his Feb. 24 budget rollout that we are entering an era where American dominance on the seas, in the skies, and in space can no longer be taken for granted,” Shaffer said.

DoD is in its third year of a protracted budget drawdown, he added, and Hagel has described three major areas that make up the budget—force size, readiness, and modernization. The current budget drives force reduction, but this reduction will take several years to yield savings, Shaffer said. In the fiscal 2015 budget, readiness and or modernization will pay a larger percentage of the overall department bill.

“To address the challenges,” he added, “we needed to examine the strategy we’re using to focus the S&T investment on high-priority areas [and] from that review emerged a strategy for investment.”

DoD invests in science and technology for three reasons, Shaffer said.

- To mitigate new and emerging threat capabilities, “and we see a significant need in the areas of electronic warfare, cyber, counter-weapons of mass destruction, and preserving space capabilities.”
- To affordably enable new or extended capabilities in military systems and future systems, “and there is a significant need to grow department systems’ engineering, modeling, and simulation and prototyping.”

- To develop technology surprise, and “we see significant need in areas such as autonomy, human systems, quantum sensing, and big data.”

Shaffer said despite the challenges, the department continues to perform, including in areas such as understanding and treating traumatic brain injury.

“In addition to the DARPA Brain Initiative, the department has developed successful technologies in this area in the medical research program and in our Army’s research program,” he told the panel.

“The combination of DARPA’s small blast gauge to measure the [amount of blast exposure] to the head, coupled with the Defense Health Program’s advances in therapeutics in photonic [or light] medicine will allow us to treat traumatic brain injury] more quickly and effectively,” Shaffer said.

From that program, researchers have discovered that intense light outside the skull prevents brain tissue decay after a TBI-inducing event. The treatment is in clinical trials, Shaffer said. In another program, the Air Force X-51 Waverider hypersonic demonstration was the second successful demo of powered scramjet technology, he added.

A scramjet, according to technical descriptions, is a variant of a ramjet air-breathing engine, but one in which combustion takes place in the craft’s supersonic airflow.

This demonstrates “that we are getting close to developing a full hypersonic system,” Shaffer said. “No one else in the world has done this.”

The Navy is making dramatic progress on high-energy laser systems and deploying a 30-kilowatt electric laser on the *USS Ponce*, an Austin-class amphibious transport dock, this summer.

If successful, Shaffer said, “this will be the first operational deployment of a directed-energy system.”

The Army is forging next-generation helicopters with their joint multirole technology demonstrator, he told the panel—a program now in the design phase with four vendors.

“These successes highlight that, in spite of a difficult year and in spite of difficult budget pressures,” Shaffer said, “the DoD S&T program continues to produce capability for our future force.”

In her testimony, Prabhakar explained that DARPA is part of the DoD S&T community, but also part of the larger national research and development ecosystem.

Within these communities, she said, DARPA’s role is “to make the pivotal early investments that change what’s possible so we can take big strides forward in our national security capabilities.

“The agency itself was created to prevent the kind of technological surprise the United States and others experienced in 1956 when the Soviets launched Sputnik, she told the panel, “and we’ve delivered on our mission for 56 years by creating a few surprises of our own.”

DARPA’s output is technology, she added, “but we count our successes when our technologies change outcomes. Every time a stealth aircraft evades an air defense system, every time a soldier on the ground can place himself precisely using GPS so he can call for fires, every time a radar tells a carrier strike group about a threat that’s out there long before it sees [them]—that’s when we’ve succeeded in our mission.”

In each case, she said, DARPA made the early investments, showed what was possible, and then the larger community turned the ideas into real capabilities.

“It took our partners that we work with very closely across the Services in science and technology. It also took the Services’ further development work and acquisition efforts. Every one of these technologies traces back to research often conducted in universities or other labs; every advance relied on defense and commercial industry, large companies and small,” Prabhakar said. “And at the end of the day, it took warfighters to turn those technologies into real military capabilities.”

That’s how the ecosystem works, she said.

For the DARPA portion of it, Prabhakar observed, “the mission we had of breakthrough technologies for national security has not changed over 56 years. The world in which we work continues to change, but that core mission is still why our people charge through the front doors every single morning.”

One surprise being created today at DARPA involves the classic approach to major military systems, which has become so costly and inflexible, she said, “that it’s really not going to be effective for the challenges that we’ll face in the future.”

Several DARPA investments focus on rethinking complex military systems, Prabhakar added, and agency scientists and engineers are coming up with powerful approaches for new radars and weapons, new ways to do navigation and communications, and new ways to create space systems.

In a very different arena, the director said, “we can see the massive scale of information changing every aspect of national security. We’re creating a new breed of cybersecurity technology so we can actually trust the information we’ve become so reliant on.”

DARPA scientists are inventing new tools to keep up with and to begin using this explosion of data, she added. One example is a new program that tackles networks involved in human trafficking.

Such trafficking networks easily can hide in vast online data, so finding ways to see bad actors in these volumes of data is part of the objective of DARPA’s program, the director said. Another program, called Plan X, is a foundational cyber warfare program that DARPA is building to create the visibility and understanding of cyberspace, Prabhakar said, “so we can start to deal with cyber warfare as it is happening today and where it will be in the future.”

Cybersecurity is one of the core foundations as people become increasingly reliant on information, the director said. “I think we’re all familiar with the challenges that our businesses and our national security enterprise face because of cyberattacks that are happening on a constant basis,” she added, “some driven by nation states, some by organizations, and some just by individuals because so many individuals around the world have at their fingertips now the ability to participate in this domain for better or for worse.” Prabhakar added, “We think that cyber environment, in which we are in a conflict today—that’s going to continue to escalate.”

Much of the conversation about cybersecurity has been about computers and networks, and they are important to keep secure, she said, but all embedded systems are highly vulnerable.

“One of our researchers a couple of years ago showed that they could hack the speedometer on a car,” the director told the panel. “If a speedometer on a car is vulnerable, then it’s a good thing to realize that all of our embedded military systems are also vulnerable. Everything has a computer in it today.”

At DARPA, the director added, “we think Plan X is going to become integral to kinetic warfighting of the future.”

Plan X core capabilities, she said, will give senior decision makers the ability to see what’s happening in cyberspace, to plan actions, to predict collateral effects, to avoid certain effects, and to do battle damage assessments.

Across the DARPA portfolio, Prabhakar said, improving information systems security is one of the agency’s highest priorities.

Researchers Develop Hands-Free, Eyes-Free Navigation for Soldiers

U.S. ARMY RESEARCH LABORATORY PUBLIC AFFAIRS (MAY 15, 2014)

Joyce M. Conant

ABERDEEN PROVING GROUND, Md.—Researchers at the U.S. Army Research Laboratory continue to develop and evaluate methods for navigation and communication that are ‘hands-free, eyes-free, and mind-free’ to aid soldiers in the field.

Soldiers wear a lightweight belt around their torso, containing miniature haptic technology. The belt provides vibratory or tactile cues allowing a soldier to navigate to map coordinates and receive communications while still carrying a weapon.

Research said initial feedback from soldiers testing the device is positive. Soldiers say they liked being able “to concentrate on other things and not the screen.”

Soldiers are able to move and communicate while keeping visual map displays in their pockets and their eyes on the surroundings.

Vibratory signals are communicated through tactile actuators inside the device. Navigation signals correspond to vibrations or pulses that tell the soldier which direction to go.

“Data are still being compiled; however, it is clear that soldiers rarely looked at the visual display when the tactile belt was ‘on.’ Soldier feedback was very positive,” said Gina Hartnett, from HRED’s Fort Rucker, Ala., field element. “This assessment gave us a great example of how a device can free up the senses so effectively. Course times were faster on tactile-assisted navigation legs. Soldiers reported being more situationally aware of their surroundings because they rarely, if ever, had to take their eyes off of their environment. Additionally, not having to interact with a visual display allowed their hands to stay on their weapon.”

As long as the tactile sensation is felt at the front of the torso, the soldier moves forward. If the sensation is at the side or



Bruce Mortimer, director of Research and Development at Engineering Acoustics, Inc., Casselberry, Fla., provides training to soldiers prior to field assessments. Soldiers quickly learn how to use a tactile navigation system and attain proficiency with the signals within 10-15 minutes.

Photo by Korey Mort, Engineering Acoustics, Inc.

back, the soldier simply turns until the GPS-enabled signal is felt at the front.

At the same time, communications are also provided by tactile means that can be from other soldiers or more intelligent ground robots—such as status updates or warnings regarding potential threat.

The vibration, or sensation the soldier feels, determines what the soldier is supposed to do or the task they are to perform and is based on the tactile language that is developed—such as with Morse code.

The patterns are developed to be distinct, unique, and consistent with the information at hand, to allow the soldier to quickly and easily interpret the cues. For example, hand signal information or specific messages such as “robot battery low” can be assigned to patterns, learned and recognized.

One may think of the vibration signals as similar to different ring types on your cellular phone. A person may know who is calling without actually looking at the screen to see the person’s name or number. It is the sound that provides the alert—not the actual sight of it.

Tactile actuators could be placed in any number of objects—such as a glove, belt, inside the helmet or vest.

Researchers from U.S. Army Research Laboratory, known as ARL, Human Research and Engineering Directorate’s Fort Benning, Ga., field element, are testing such tactile systems for navigation and/or communication during mission-relevant exercises to determine the effectiveness of these devices while wearing them and seeing how they perform during actual use. Soldiers quickly learn the system, attaining proficiency with the signals within 10-15 minutes.

Soldiers recently participated in an assessment of the Nav-Com system at Fort Benning, to evaluate simultaneous presentations of navigation and robot communication/monitoring using tactile patterns of two types of advanced tactors during operationally relevant scenarios. Researchers asked soldiers to complete several combat-related tasks during this exercise.

The scenarios involved night land navigation on equivalent courses of about 900 meters. While navigating from waypoint to waypoint, soldiers also received communications from a hypothetical autonomous robot regarding either the robot’s status or a possible threat detected by the robot. Ad-

ditionally, soldiers negotiated exclusion zones and identified enemy targets along the course.

The system automatically collected data, such as time to each waypoint and accuracy to each waypoint. Observer-based data collection included accuracy of robot alerts, number of times soldiers looked down at their screen, took their hand off of their weapon, and correctly identified a target on the course. Subjective data were also collected after each mission in the form of a workload assessment and questionnaire followed by an after action review at the end of the night.

Harnett said that some specific comments from the soldiers included:

- “I was more aware of my surroundings.”
- “I don’t ‘land nav’ much, but this made it a no-brainer.”
- “I loved the belt, it worked perfectly.”

“This stream of research is very dear to my heart,” said Dr. Linda Elliott, from HRED’s Fort Benning field element. “It’s not often a soldier can pick up a piece of equipment, be trained in five to 10 minutes, and have a very positive experience. In a previous night study, soldiers said they were blind—night, fog, rain, night vision devices fogging up, etc.—and the belt led them straight to point, allowing them to focus attention on their surroundings.”

Elliott said the system supports the three basic soldier tasks—move, shoot, and communicate—all while allowing individuals to move more quickly, accurately, find more targets in their environment and be more effective at covert communications.

“At the same time, we are trying to collect more basic data, to identify the factors that make a tactile signal ‘salient’—easily felt, immediately recognized and distinguished from others. That has to do with the type of tactile signal strength and other engineering factors, individual differences such as fatigue, and environmental factors.”

Tactile systems for military performance have demonstrated their potential with regard to capability achievement and performance advantage, across a number of applications. Experiments and demonstrations have been conducted across a wide range of settings, from laboratory tasks to high-fidelity simulations and real-world environments.

Several ARL studies have been conducted within the context of soldier land navigation to investigate effects of tactile cues in context. Many of these studies have been published as ARL technical reports.

Elliott said that subsequent experiments proved the value of tactile systems to support soldier navigation and communication, but at the same time, systems must be improved and refined before they can be practical in combat situations.

“They must be made lightweight, comfortable, rugged, networked within a command and control system, and they must be easy to use and easy to maintain,” Elliott said. “As tactile displays are increasingly used for communication of more complex and multiple concepts, it will become evident that tactile and multi-sensory systems in general must be designed for rapid and easy comprehension.”

The U.S. Army Research Laboratory is part of the U.S. Army Research, Development and Engineering Command, or RDECOM, which has the mission to develop technology and engineering solutions for America’s soldiers.

RDECOM is a major subordinate command of the U.S. Army Materiel Command. AMC is the Army’s premier provider of materiel readiness—technology, acquisition support, materiel development, logistics power projection, and sustainment—to the total force, across the spectrum of joint military operations. If a soldier shoots it, drives it, flies it, wears it, eats it, or communicates with it, AMC provides it.

Researchers Consider Miniature Robots to Enhance Capabilities

U.S. ARMY RESEARCH LABORATORY PUBLIC AFFAIRS (MAY 15, 2014)

Tracie R. Dean

ADELPHI, Md.—A small team of elite special forces operators must hunt down a highly sought after terrorist leader. This terrorist has taken refuge in an urban environment, which offers concealment behind an array of structures, walls, and other obstacles.

In today’s Army, this type of scenario may expose soldiers to a very high level of risk, while attempting to locate, identify, and engage high-priority targets. However, in the future Army, a team of miniature ground and aerial robots may be able to enter the high risk zones and conduct a coordinated search, communicating with one another, and ultimately conveying critical information to soldiers who are far removed from harm’s way.

Micro Autonomous Systems and Technology, known as MAST, offers this potential capability and is being aggressively studied by researchers at the U.S. Army Research Laboratory, known as ARL, who are collaborating with both industry and academia under a collaborative technology alliance, or CTA.



Enhancing strategic situational awareness in urban and complex terrain by enabling the autonomous operation of a family of small devices that walk, crawl, fly, communicate, and work effectively with one another as a unit, and then share all the information with a command and control center, to save soldiers' lives and prevent them from going in harm's way. U.S. Army photo illustration

"The MAST program seeks to enhance the tactical situational awareness of the dismounted soldier in urban and complex terrain by enabling the autonomous operation of a collaborative ensemble of multifunctional mobile microsystems," said Dr. Brett Piekarski, chief of ARL Micro and Nano Materials and Devices Branch within the Sensors and Electron Devices Directorate and cooperative agreement manager of the MAST CTA.

The structure and goals of the MAST CTA were developed by Dr. Tom Doligalski and Dr. Joseph Mait. Mait led the CTA when it was awarded in February 2008. The CTA is comprised of four research centers and numerous consortium members. The research centers include the Platform Integration Center, BAE Systems (lead); Microsystem Me-

chanics Center, University of Maryland; Processing for Autonomous Operation Center, University of Pennsylvania; and Microelectronics Center, University of Michigan.

Other consortium members include the California Institute of Technology, Georgia Institute of Technology, Harvard University, Jet Propulsion Laboratory, Massachusetts Institute of Technology, North Carolina Agriculture and Technical University, University of California-Berkeley, University of New Mexico, and the University of Pennsylvania.

The technical approach to meet the goals and objectives of the MAST CTA is to focus on the critical science and technology research areas as they pertain to small-scale platforms including mobility, control, and energetics; com-

munication, navigation, and coordination; and sensing, perception, and processing.

In the areas of mobility, control, and energetics, researchers are studying aeromechanics at small scales, body and appendage design at small scales, algorithms for complex navigation, and small-scale platform propulsion and actuation. In the area of communication, navigation, and coordination, researchers are focusing on how to enable intelligent communication, networking, and collaboration between micro autonomous robotic platforms. Under sensing, perception, and processing, researchers are looking at low power sensors for navigation; obstacle detection; and intelligence, surveillance, and reconnaissance.

As the originator of the program, Mait commented on the conditions that led to the program's focus and eventual structure.

"In 2005, the world had just witnessed the Defense Advanced Research Projects Agency's grand challenge, which indicated what autonomous systems were capable of doing," Mait said. "The autonomy that was displayed was made possible by large racks of equipment that were put in the back of large SUVs.

"For the types of missions that we had envisioned, the sizes of those vehicles were simply not suitable," Mait continued. "We were presented with the problem of taking the level of intelligence that had already been displayed and packaging it into something you can hold in the palm of your hand.

"At the time, we were one of the few in the U.S. looking at this issue," Mait explained. "The vision for MAST came about when we realized we couldn't take solutions that worked on large scales and shrink them down for a large platform. It wasn't going to be just a platforms, sensors, or algorithms program; we needed to look at the system as a whole, which is what led to the genesis of MAST."

Mait, who currently serves as ARL's chief scientist, continued by offering a unique perspective on what MAST means to ARL's program in intelligent systems.

"Since the program was awarded, I am gratified at what has come out of MAST CTA," Mait said. "One being from a small company spun out of the University of Pennsylvania that produces little quad-rotors made to fit in the palm of a hand. This device has a large percent of the capabilities that we have wanted. That is a true sign of progress and the types of innovation that we supported through the MAST CTA. Within ARL itself, it has established us now as an organiza-

tion capable of delivering autonomous platforms that are as large as a passenger vehicle, but also as small as something that can be carried around with two arms then also carried in a single hand."

Within the consortium, researchers are confident of their capability to develop autonomous systems at all scales, which Mait believes will open doors and allow for greater creativity.

As for the next generation of MAST and its importance to the soldier of the future, Piekarski said the program will continue to facilitate the platform that will provide unprecedented operational capabilities to the warfighter.

"We're going to have to have integrated solutions to make those things a reality, and that's where our program is going," Piekarski said.

Tail as Important as Tooth in Combat, Says Top Logistician

ARMY NEWS SERVICE (MAY 21, 2014)

David Vergun

ARLINGTON, Va.—"I truly understand we want the pointy end of the spear and a lot of trigger pullers ... but just saying 'reduce the tail, reduce the tail' is a risky proposition."

Lt. Gen. Raymond V. Mason, deputy chief of staff, G-4, was referring to a "tooth-to-tail" ratio with the tail being logistics supporting the infantry.

He delivered his remarks at the Association of the U.S. Army's "Sustaining Force 2025" seminar here, yesterday.

Like many things in life, he said the ratio involves a tradeoff.

"There are a lot of innovative things can be done to reduce the tail, but just cutting it and taking out capability before putting in a mitigation process and solution set just increases risk."

He then made reference to what Army Vice Chief of Staff John F. Campbell spoke to earlier in the morning—the notion of "just-in-time" business practice used for military applications.

"The closer you get where people are fighting and dying, business practices don't make sense. But there are money people and programmers that want to drive this."

Just in time, for example, is used by retailers who order just enough stock to fill orders or over-the-counter sales. Any

more than that would likely be excess inventory with associated high overhead costs.

Business practice for the military, Mason said, would work out to having just enough ammunition to kill the last enemy with the last remaining bullet.

"We don't want the other end of the spectrum, where there's 'just-in-case' logistics, solving everything with mass. We tend to do that. We did that in Desert Storm and the beginning of OIF," he said.

Once again, Mason pointed out the need to find that sweet spot in tradeoffs, citing two examples, the first being "just-in-case" logistics:

"Many ammunition lines in Afghanistan had 10 years' capability on the ground because the commanders don't trust us," he said, adding that one reason may be skepticism in the IT system. "If commanders don't see it, they don't trust the system, so they order more and more ammunition."

Mason then showed a PowerPoint slide showing a 1999 Humvee on the left, and a 2014 one on the right.

The one on the left side looked like a chop shop had cleaned out a lot of goodies while the one on the right was jazzed up for the 21st-century battlefield.

In 1999, "a company commander might have had a speaker and a radio," he said, referring to add-on components. The Humvee on the right was armored and had computerized displays, a gun turret, and other gizmos.

Today, "our vehicles have become fighting platforms," he said, just "like Bradleys and tanks."

The Army hasn't really "taken that on," he said, referring to the associated costs from the unit to the depot levels.

The "one on the right is exponentially more expensive at every level of maintenance and repair parts. Do you know what's driving that cost?" he asked the audience.

"Software," replied someone.

"Right," he said. "Software costs are becoming unaffordable. We can't afford to have every vehicle in the Army look like this."

Mason then returned to his tradeoff theme, illustrating how complex a cost-benefit analysis can be.

In the Army's 2025 motor pool, "which vehicles will look like the one on the left and which will look like the one on the right?"

G-3/8 is working their way through that, he said.

"It's a tough thing to do," he explained. "It's a leadership issue as well."

He explained that a corporal who is deployed using the Humvee on the right gets spoiled by the features, and when he "comes back home, they stick him in the vehicle on the left. Then it becomes a motivation and retention issue as well," as a pure cost calculus.

One area that doesn't necessarily involve trade-offs is operational energy, Mason said, referring to it as "a growth industry."

Operational energy involves designing vehicles and generators to use fuel more efficiently and using energy other than fossil fuels when practicable.

"My challenge is to convince leadership to keep investing" in operational energy, he noted.

Besides operational energy, Mason said fuel consumption can also be a leadership issue.

Generators in Afghanistan consume 55 percent of the fuel, powering things like hospitals, living quarters, exchanges, gyms, and barber shops.

"FOBs [Forward Operating Bases] become little Fort Hoods," he said.

Commanders need to ask themselves, "How good does it have to be in terms of quality of life?" versus using a lot of that fuel to power vehicles and aircraft.

Mason then illustrated the importance of energy to decision making by combatant commanders.

There were two metrics Gen. Tommy Franks "had in making the decision to cross the berm" into Iraq, he said. "One was how much fuel we had" and the second was the supply of batteries, which at the time were in short supply.

SACRED COWS

Nothing is too sacred in logistics to question, Mason said, citing four examples:



Army Lt. Gen. Raymond V. Mason, deputy chief of staff, G-4, talks logistics at AUSA's "Sustaining Force 2025" seminar, in Arlington, Va., May 20, 2014. Photo by David Vergun

First, "how does a nation go to war?" and by default, how does the Army go to war?

Ideally, "we're going to go in fast, we're going to go in light, we're going to win, we're going to come home. But when did that happen in our lifetime?" he asked.

In reality, "we go in light and fast and end up staying a long time," he said. Getting out of the fight is more problematic than getting in.

"It's one of the challenges of why people look at the Army and say 'it's so big, it's [deployed] so long, and they can't get out.' That's why they call the Marine Corps."

Not that getting in is a cakewalk either, he said. "We're still in the mode of planning to deploy a year out. That's got to change."

Leadership is aware of that challenge, he said, and is trying to create a more expeditionary Army, with logistics playing a big part of that, which leads to point number two, getting all the stuff over there, wherever that may be.

Most of the heavy stuff is still going to be sea-lifted for the foreseeable future. How that's done may need to change,

he said, referring not to new high-speed vessels, which are promising, but something even simpler—loading them.

"We load our ships administratively," he said. "It's efficient for TRANSCOM, but it's not effective" for commanders.

Ships, and even aircraft, have to be combat-configured in loading so what comes out are ready-to-fight platforms, he said. For example, a ship loaded with Humvees and nothing else won't do a commander any good if he has to wait for another ship carrying weaponry. "You don't want to try to build all that infrastructure in the battlespace."

A third topic that needs to be thoroughly debated is the "operational reserves."

He noted the fine achievements played by the Guard and Reserve in Iraq and Afghanistan, with soldiers "asked to leave their jobs with little notice, not knowing if their jobs would still be there when they returned."

But, with only "39 days of training a year, you won't get an operational combat-ready force. It'll generally just get the individual soldier ready" with stuff like marksmanship and basic military training.

Just 39 days doesn't provide enough time for extensive unit training, Mason said.

"We may need more investment there," he said, as the Army is relying more and more on the Guard and Reserve. "It concerns me."

A fourth area that Mason said needs to be debated is one of the Army's strategic cornerstones of its formations: modularity. "We gave the brigades everything," he said. Gone are the unit allocations of equipment that's "authorized and required."

While not advocating dismemberment of modularity, Mason said it's "an expensive readiness model we can't afford" and there needs to be more activity on how to "balance" that.

BREAKING HABITS

Others have said that the Army is in the process of moving from a counterinsurgency model to one of full-decisive action and unified land operations, but Mason was blunt about re-learning the complete art of warfare.

"We got bad habits" over the last 12 years of war "when we became boxed in" with counterinsurgency. "We became sedentary when a lot of stuff started showing up at the FOBs," he said.

Many soldiers don't even know what a ROM is anymore, and many that do haven't done one in the last 10 years, he said, noting that ROM means refuel on the move.

Other lost arts include echeloning logistics capabilities and "jumping the BSA," or brigade support area, he said.

When the Iranians "started getting a little froggy" a while back, soldiers started looking around for their gas masks, Mason said, with some of them remembering that they "left it back in the locker at Fort Hood."

The Army is also learning to become more agile in its global commitments, he said, a concept referred to as "regionally aligned forces." And, one of the biggest regions is the Pacific, an area soldiers haven't been fighting in since Vietnam, not counting small counterinsurgency operations.

In its "rebalance to Pacific," the Army is now working on how to put the right kinds of capabilities there, he said. "We just don't see a lot of force structure building up initially. We're looking at putting some pre-positioned supplies there like ammunition and logistics nodes. And, we're looking at where we want to put it—Australia, Guam—we'll see where it goes.

But we'll continue to do a lot of exercises" with partner nations.

HAPPY OUTCOMES

The Army has done a lot of things right over the years, Mason said, in a closing note of optimism for the Army of 2025.

At the beginning of World War II, when the nation "was on its butt" and Americans feared California would be invaded, the Army did some out-of-the-box thinking. Shortly after Pearl Harbor, B-25s were stripped down to conserve fuel and were sent to bomb mainland Japan in the so-called Doolittle Raid, he said.

"Tactically, the raid was insignificant. It didn't do anything," he said. But, "strategically, it was huge. It sent out the message 'we can reach out and touch you.'"

That kind of bold thinking and action is needed today, he said.

Another success story is the all-volunteer Army, he said.

"Pundits said if the U.S. ever got into a protracted conflict, it would have to go back to the draft," he said. "They've been proven wrong."

But the all-volunteer force comes with a price tag, he added.

"It's a relatively expensive force in terms of compensation, retirement, and medical. That's why all the Services are trying to figure out how to control escalating costs, just as healthcare costs are rising for civilians. There's got to be some give and take in that, and they're working their way through that."

Mason then provided two recent examples of success in Iraq and Afghanistan.

One was the up-armor of about 50,000 vehicles in a combat zone. It "was kind of like a NASCAR pit stop operation," he said. "We pulled the vehicles off the gun line and up-armed them at night. The industrial base did that. There are literally thousands of Americans walking around today alive because of the work done by the American industrial base."

Another success was achieved in Afghanistan after the main supply route in Pakistan was cut. Commercial aircraft and Air Force transports became the Army's "incredible left partners, flying in supplies," he said, noting that it's a good thing

the enemy didn't find a way to shoot them down."

He said "someone should write a book about that" effort, comparing it favorably to the Red Ball Express of World War II, where the allies moved quickly inland from the beaches of Normandy toward Germany, relying on an efficient network of express lanes to move supplies to the front lines by trucks.

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Better Buying Initiatives to Help Acquisition Professionals Save Money

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Beth Reece

Acquisition professionals' commitment to continuous improvement could help the military services adjust to smaller budgets, a senior defense acquisition leader said May 20.

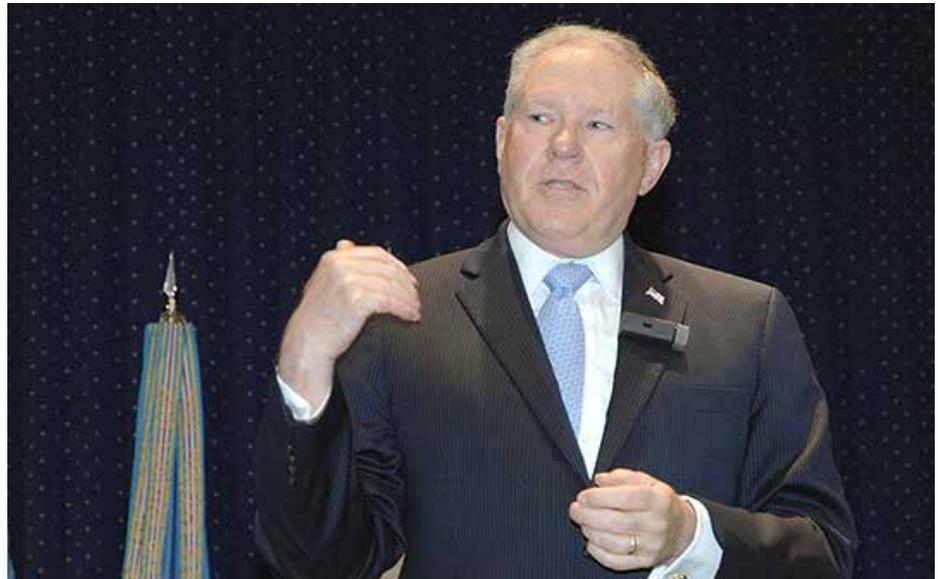
Under Secretary of Defense for Acquisition, Technology and Logistics Frank Kendall spoke to Defense Logistics Agency employees at the McNamara Headquarters Complex during an update on the defense budget and the Better Buying Power 2.0 initiative.

Better Buying Power 2.0 is the second phase of DoD's efforts to strengthen its buying power and improve industry productivity. Better Buying Power 1.0 began in 2010 with 23 goals, some of which are now integrated into DoD's business processes. Others are part of 2.0, which includes 36 goals in seven focus areas.

"The whole idea is about controlling costs and being conscious of costs," Kendall said, adding that affordability is more important than ever.

"The departments kill a lot of programs because they find out after several years and several billion dollars that they were unaffordable," he added. "We have to limit our programs to the things that we know we can afford."

Kendall said acquisition professionals must work harder to determine what an item should cost rather than blindly going with a price that's within budget. That means analyzing



Under Secretary of Defense for Acquisition, Technology and Logistics Frank Kendall describes how employees can contribute to Better Buying Power 2.0, during a town hall at the McNamara Headquarters Complex May 20.

Photo by Teodora Mocanu

all aspects of the contract and looking for specific areas in which costs can be lowered.

"You look for places where you can save money and do better than what's been done historically or previously. It's about being aware of and focusing on the cost," he said.

Promoting competition within industry can also reduce costs, he said.

"Competition works better than anything to reduce cost, whether it's through reverse auctions, regular auctions, or any other means. Competition does work," he stressed.

Aligning profit with performance is another way acquisition professionals can encourage productivity, he continued. Rewarding manufacturers that provide material at lower prices, earlier than scheduled or more technically advanced than planned, for example, benefits the Defense Department while encouraging industry to be more innovative.

Better Buying Power 2.0 is about continuously improving processes as well as building an acquisition talent pool and improving employees' skills, Kendall said.

"It's about not accepting the status quo, challenging the way you do business, rethinking it, looking for better ways to do things, measuring performance, and then making adjustments," he added.

Kendall said consideration has already been given to Better Buying Power 3.0, which he said he expects to focus more on equipping warfighters with the latest technology. The work acquisition professionals do to save money through Better Buying Power 2.0 will help make funds available for technology developments.

“So you are an enabler for the other things the department does. Every penny you can save has a very good place to go in terms of getting us more capability,” Kendall added.

The town hall was followed by three focus groups in which DLA Acquisition employees discussed how they can improve workforce development, program management, and industry productivity.

Kendall also presented spotlight awards to the following DLA teams for saving DoD money:

- Reverse Auction Team
- First Destination Transportation/Packaging Initiative Team
- Bearing Division Acquisition Team
- DoD National Contracts Team
- Natural Gas Team