

DoD Announces \$150 Billion Reinvestment from Efficiencies Savings

DEPARTMENT OF DEFENSE NEWS RELEASE (JAN. 6, 2011)

Secretary of Defense Robert M. Gates announced today a series of efficiencies decisions designed to save the Department of Defense more than \$150 billion over the next 5 years, primarily by reducing overhead costs, improving business practices, and culling excess or troubled programs. Most of the resulting savings will be used by the Army, Navy, Marine Corps, and Air Force to invest in high-priority programs that strengthen warfighting capabilities.

In anticipation of an era of modest defense budget growth, Gates launched a comprehensive effort last May to reduce the department's overhead expenditures. The goal was to sustain the military's size and strength over the long term by reinvesting those efficiency savings in force structure and other key combat capabilities. Specifically, the military services were directed to find at least \$100 billion in savings that they could keep and shift to higher priority programs. To achieve the savings targets, Service leadership conducted a thorough and vigorous scrub of bureaucratic structures, facilities, programs, business practices, civilian and military personnel levels, and associated overhead costs.

The measures announced today are the latest in a series of DoD reform initiatives, to include the President's last two annual defense budgets, which have rebalanced the department's spending habits while increasing investments in proven capabilities most relevant to both current wars and to the most likely future threats.

"Meeting real-world requirements. Doing right by our people. Reducing excess. Being more efficient. Squeezing costs. Setting priorities and sticking to them. Making tough choices. These are all things that we should do as a department and as a military regardless of the time and circumstance. But they are more important than ever at a time of extreme fiscal duress, when budget pressures and scrutiny fall on all areas of government, including defense," said Gates.

"While America is at war and confronts a range of future security threats, it is important to not repeat the mistakes of the past by making drastic and ill-conceived cuts to the overall defense budget. At the same time, it is imperative for this department to eliminate wasteful, excessive, and unneeded spending. Indeed, to do everything we can to make every defense dollar count."

The Service departments achieved savings in several areas, including the number and size of headquarters staffs, base operations, energy consumption, and facilities sustainment.

At the same time, the Service leaders undertook the normal process of setting priorities and assessing risks in preparing the fiscal 2012 budget request—a process that led to the recommended termination or restructuring of a number of troubled or unneeded weapons programs.

The Services will keep the savings they were motivated to find and reinvest in the needed capabilities each Service needs to support the warfighter. The bulk of the savings will be used by the Service departments to make key investments in areas such as shipbuilding; long-range strike; missile defense; intelligence, surveillance, and reconnaissance (ISR); wounded warrior care and facilities; and much more.

Specifically, the Department of the Navy is proposing to use efficiencies savings to:

- Accelerate development of a new generation of electronic jammers to improve the Navy's ability to fight and survive in an anti-access environment;
- Increase the repair and refurbishment of Marine equipment used in Iraq and Afghanistan;
- Develop a new generation of seaborne unmanned strike and surveillance aircraft;
- Buy more of the latest model F-18s and extend the service life of 150 of these aircraft as a hedge against more delays in the deployment of the Joint Strike Fighter (JSF); and
- Purchase additional ships—including a destroyer, a littoral combat ship, an ocean surveillance vessel, and fleet oilers.

The Department of the Navy proposed efficiencies savings of more than \$35 billion over 5 years to include:

- Reducing manpower ashore and reassigning 6,000 personnel to operational missions at sea;
- Using multi-year procurement to save more than \$1.3 billion on the purchase of new airborne surveillance, jamming, and fighter aircraft;
- Disestablishing several staffs (but not the associated platforms) to include submarine, patrol aircraft, and destroyer squadrons plus one carrier strike group staff; and
- Disestablishing the headquarters of Second Fleet at Norfolk, Va., and transferring responsibility for its mission to the Navy's Fleet Forces Command.

For the Department of the Air Force, this efficiencies process made it possible to:

- Buy more of the most advanced Reaper Unmanned Aerial Vehicles (UAVs) and move essential ISR programs from the temporary war budget to the permanent base budget. Going forward, advanced unmanned strike and reconnaissance capabilities must become an integrated part of the Service's regular institutional force structure;

- Increase procurement of the Evolved Expendable Launch Vehicle to assure access to space for both military and other government agencies while sustaining our industrial base;
- Modernize the radars of F-15s to keep this key fighter viable well into the future;
- Buy more simulators for JSF air crew training; and
- Develop a new long-range, nuclear-capable penetrating bomber, which will be designed using proven technologies—an approach that should make it possible to deliver this capability on schedule and in quantity.

The Air Force proposed efficiencies measures that will total some \$34 billion over 5 years and include:

- Consolidating two air operations centers in the United States and two in Europe;
- Consolidating three numbered Air Force staffs;
- Saving \$500 million by reducing fuel and energy consumption within the Air Mobility Command;
- Improving depot and supply chain business processes to sustain weapons systems, thus improving readiness at lower cost; and
- Reducing the cost of communications infrastructure by 25 percent.

The Department of the Army would use its savings to:

- Provide improved suicide prevention and substance abuse counseling for soldiers;
- Modernize its battle fleet of Abrams tanks, Bradley fighting vehicles, and Stryker wheeled vehicles;
- Accelerate fielding to the soldier level of the Army's new tactical communications network;
- Accelerate procurement of the Service's most advanced Grey Eagle UAVs; and
- Buy more MC-12 reconnaissance aircraft to support ground forces, and begin development of a new vertical unmanned air system to support the Army in the future.

The Army proposed \$29 billion in savings over 5 years to include:

- Terminating the Surface-Launched Advanced Medium-Range Air-to-Air Missile and the Non-Line-of-Sight Launch System, the next-generation missile launcher originally conceived as part of the Future Combat System;
- Reducing manning by more than 1,000 positions by eliminating unneeded task forces and consolidating six installation management commands into four;
- Saving \$1.4 billion in military construction costs by sustaining existing facilities; and
- Consolidating the Service's e-mail infrastructure and data centers, which should save \$500 million over 5 years.

Of the \$100 billion identified by the Service departments, approximately \$28 billion will also be used over the next 5 years by the Army, Air Force, Navy, and Marine Corps to deal with higher than expected operating expenses such as fuel, maintenance, health care, and training costs.

In addition to directing the four Services to find savings, Gates announced last August a set of initiatives aimed at reducing overhead costs and improving efficiency across the DoD as a whole—with special attention to the headquarters and support bureaucracies in the Office of the Secretary of Defense, the combatant commands, and other defense agencies and field activities.

Gates announced today that this effort—combined with a government-wide freeze on civilian salaries—has yielded approximately \$54 billion in savings over the next 5 years. These savings include further reducing the contractor staff cadre; consolidating IT support; culling redundant intelligence organizations; eliminating unnecessary reports and studies; freezing civilian staff levels and pay; downgrading overseas commands; decreasing the number of generals, admirals, and civilian executives; and modest increases in TRICARE premiums on military retirees.

In addition to terminating the Marine Corps Expeditionary Fighting Vehicle, Gates also stated that he is placing the Marine Corps' short take-off and vertical landing variant of the JSF on the equivalent of a 2-year probation because of significant testing problems. As a result, the development of the Marine variant will be moved to the back of the overall JSF production sequence. To fill the gap created from the slip in the JSF production schedule, the Department of the Navy will buy more Navy F/A-18s.

The formal announcement of the President's fiscal 2012 budget submission next month is also expected to call for a \$78 billion reduction to the Future Years Defense Plan (FYDP), to include no real growth in defense spending in fiscal 2015 and fiscal 2016. But because of the rigorous reform efforts undertaken over the past year, it is possible for the DoD to absorb this reduction in the projected top line without significant impact to warfighting capability, although it will necessitate a reduction in the size of the Army and Marine Corps starting in fiscal 2015. The total savings generated by DoD-wide overhead efficiencies, the civilian staffing and pay freeze, and the future decrease in ground forces, when added together, are roughly equivalent to the sum of the top-line reductions projected in the FYDP.

With the efficiencies savings, Gates said he is confident the department can effectively meet the threats it is likely to face

over the next few years. But he also stressed the FYDP represents the minimum level of defense spending necessary given the complex and unpredictable array of security challenges the United States faces around the globe. Beyond this 5-year time frame, the savings from overhead efficiencies and force reductions will have mostly run their course.

Gates concluded by talking about the importance of following through on all DoD reform measures while maintaining adequate levels of funding.

"This Department simply cannot risk continuing down the same path—where our investment priorities, bureaucratic habits, and lax attitudes toward costs are increasingly divorced from the real threats of today, the growing perils of tomorrow, and the nation's grim financial outlook," Gates declared at the conclusion of today's announcement.

"These times demand that all of our nation's leaders rise above the politics and parochialism that have too often plagued considerations of our nation's defense—whether from inside the Pentagon, from industry and interest groups, and from one end of Pennsylvania Avenue to the other. I look forward to working through the next phase of the President's defense reform effort with the Congress in the weeks and months ahead—to do what's right for our Armed Forces and what's right for our country."

DoD Makes Case to Improve Business Models

88th AIR BASE WING PUBLIC AFFAIRS (JAN. 7, 2011)

Daryl Mayer

WRIGHT-PATTERSON AIR FORCE BASE, Ohio—"DoD doesn't have enough money unless we change how we do business," stated Frank Kendall, principal deputy under secretary of defense for acquisition, technology and logistics.

Kendall addressed a packed auditorium in the Air Force Institute of Technology's Kenney Hall here Jan. 4, 2011, in the third of 12 planned visits to major defense acquisition centers. His objective was to open a frank dialogue throughout the Department of Defense on the initiatives proposed by Dr. Ashton Carter, under secretary of defense for acquisition, technology and logistics, to deal with budgets that loom on the horizon.

"We've got a major problem," said Kendall, who estimated there will be money enough to fund only one major acquisition program per Service over the next 15- to 20-year span.

A situation of that magnitude requires one to go where the money is, and—as Kendall pointed out—"acquisition is where the money is."



Air Force Lt. Gen. Tom Owen, Aeronautical Systems Center (ASC) commander, escorts Frank Kendall, principal deputy under secretary of defense for acquisition, technology and logistics, to a meeting with Air Force program executive officers and ASC senior leaders. Kendall was at Wright-Patterson AFB, Ohio, to brief on a series of initiatives to increase efficiency in the acquisition system.

U.S. Air Force photo

At the heart, Kendall explained, a culture shift is needed.

"Today, you get money for a program and execute it. Success is measured by getting money out the door. We have to put incentives in place to reverse this impulse," he said. "Program managers that don't spend money, but still get the job done, should be rewarded for that."

That, in a nutshell, explains, Carter's oft cited instruction to "do more without more," which essentially means finding efficiencies in a program to allow purchasing more products with the same amount of money.

"We need our program managers to take an aggressive approach to getting better business deals for the government so it works to our advantage and reduces costs," he said.

One incentive already in place allows Services to keep any savings within the Service. The idea here, he explained, is to prompt Services to move money from unproductive programs or processes and redirect that money to programs that put real results in the hands of the warfighter.

Recognizing that knowledge at the comprehension level is crucial to success, Kendall and Carter have taken to the road to fully explain their intent and to gather feedback from the field in person.

"This is the beginning of a continuous improvement process," Kendall said. "Our intent is not to create dogma you must blindly follow. When you see something that doesn't make sense, we want you to elevate that concern up the chain."

Kendall listed and spoke at length to each of five initiatives Carter is advocating.

- Target Affordability and Control Cost Growth
- Incentivize Productivity and Innovation in Industry
- Promote Real Competition
- Improve Tradecraft in Acquisition of Services
- Reduce Non-Productive Processes and Bureaucracy

Going over each item individually, he cited several key points, such as incorporating affordability early in the requirements definition process. He identified a handful of programs that had substantial DoD investment only to be canceled because they weren't affordable.

"We've got to decide if we can afford a program much earlier in the process," he said.

Kendall also dispelled the notion that DoD is "anti-profit."

"There is no war on profits," he said. "We care about the price we pay and about getting value. Ultimately, we want to reward productivity."

Achieving the intended results will require government managers to improve certain skills.

The ability to conduct a strong Business Case Analysis—which he defined as a Return on Investment analysis—along with the ability to conduct face-to-face negotiations with industry and deal with cost overruns are all skills that need improvement within the government ranks.

In closing, Kendall reiterated the need for involvement and feedback at all managerial levels.

"We aren't trying to create dogma. We want you to think," he said. "I'm going to leave here and you're going to have to do this. We're counting on you."

Mayer is with 88th Air Base Wing Public Affairs.

ACC Renames Contracting Centers

ARMY CONTRACTING COMMAND NEWS RELEASE
(JAN. 19, 2011)

FORT BELVOIR, Va.—The U.S. Army Contracting Command announced today the renaming of its major contracting centers to reflect their geographical locations. The centers provide comprehensive acquisition, contracting, business advisory, production support, and depot-level maintenance services in acquiring, fielding, and sustaining Army weapon systems, services, and soldier support.

ACC soldiers and civilians work with commercial firms to acquire equipment, supplies, and services for America's Army. If a soldier shoots it, drives it, flies it, communicates with it, wears it, or eats it—ACC contracts for it.

Commenting on the reason for the change, Jeff Parsons, ACC executive director, stated: "Over the past two years, we've come to realize the importance of establishing a consistent and practical identity across the organization. After much study and consideration, the one area we believe can achieve some major returns on investment is branding and standardizing the naming convention of the ACC contracting centers. We decided to incorporate the geographical locations of the centers in their new names."

The former and new names of the seven ACC contracting centers are effective today.

National Capital Region Contracting Center	Army Contracting Command-National Capital Region	Alexandria, Va.
Tank-Automotive Command (TACOM) Contracting Center	Army Contracting Command-Warren	Warren, Mich.
Communications-Electronics Command (CECOM) Contracting Center	Army Contracting Command-Aberdeen Proving Ground (C4ISR) [Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance]	Aberdeen Proving Ground, Md.
Research, Development, and Engineering Command (RDECOM) Contracting Center	Army Contracting Command-Aberdeen Proving Ground (SCRT) [Soldier, Chemical, Research, and Test]	Aberdeen Proving Ground, Md.
Joint Munitions and Lethality (JM&L) Contracting Center	Army Contracting Command-Picatinny	Picatinny Arsenal, N.J.
Aviation and Missile Command (AMCOM) Contracting Center	Army Contracting Command-Redstone	Redstone Arsenal, Ala.
Rock Island Contracting Center	Army Contracting Command-Rock Island	Rock Island Arsenal, Ill.

Criticisms Mean Efficiencies on Right Track, Lynn Says

AMERICAN FORCES PRESS SERVICE (JAN. 25, 2011)

Jim Garamone

BRUSSELS, Belgium—Members of Congress from both parties have expressed the opinion that the Defense Department has cut too much or too little from the defense budget.

“In Washington, if you get criticized from both sides, it usually means you have the right position,” Deputy Defense Secretary William J. Lynn said here today.

Though Lynn traveled here to participate in cybersecurity discussions at NATO, he also spoke with reporters about the defense budget and the implications of Defense Secretary Robert M. Gates’ decision to find and reassign \$100 billion worth of efficiencies over the next 5 fiscal years.

“What we’ve tried to do is strike the right balance between fiscal responsibility and what is a very large deficit, and maintaining the critical capabilities we need for national defense,” Lynn said.

The money saved in the efficiencies stay with the Services to reinvest in more critical technologies. So, Gates axed or restructured a number of weapons programs, and the Services will invest the money saved in cyberdefense, long-range strike capabilities, unmanned aerial vehicles, rocket launchers, ships, and refurbishing Army and Marine Corps vehicles stressed and strained by 10 years of war.

“We’ve reinvested across a large range of capabilities,” Lynn said. “We’re reducing layering, we’re reducing headquarters, we’re reducing staff. We were able to develop \$78 billion in topline reductions that met some of the deficit reduction needs without compromising defense capabilities. We are moving forward with what we think is a balanced program.

“We think \$78 billion was an impressive number, and we were able to accommodate it within the efficiencies,” he continued. “It was a number we developed and worked with the White House. It was aggressive without compromising defense capabilities.”

All NATO nations are facing a budgetary squeeze, Lynn said, and the United States has “some concern about the level of cuts across NATO.” The fiscal pinch, he said, is forcing NATO nations to think about new ways of working together to develop new capabilities.

“Inevitably, [the fiscal problem] leads you toward more burden-sharing,” Lynn said. “I think particularly the smaller nations will move toward not seeking full-spectrum capability, but trying to identify areas where they have a comparative advantage and where they can bring more to the alliance.”

TRANSCOM Provides America’s Greatest Advantage, Commander Says

AMERICAN FORCES PRESS SERVICE (FEB. 7, 2011)

Jim Garamone

WASHINGTON—The greatest advantage that the United States has over any potential enemy is the ability to project and sustain forces anywhere in the world, the commander of U.S. Transportation Command said here today.

“No other nation can do what we do,” Air Force Gen. Duncan J. McNabb, said at the Center for Strategic and International Studies.

A decade of war has meant TRANSCOM is agile and practiced at delivering equipment, materiel, and people where it needs to be, when it needs to be there, he said. The Service portions of the command—the Air Force’s Air Mobility Command, the Navy’s Military Sealift Command, and the

Army's Surface Deployment and Distribution Command—work together closely and constantly, he added.

Experience since Sept. 11, 2001, has changed the way the command does business, the general said. Before, he explained, delivering logistics was relatively straightforward—officials chose a mode of transport and sent the cargo on its way.

“What we've found, like the rest of the industry, is that if you can figure out how to do this intermodally, you can figure out where I can go commercially, and then where I need to go militarily, or I can go surface or air, depending on the threat,” he said.

This allows planners to ensure they are taking care of warfighters while delivering people, supplies, and equipment in the most cost-efficient manner, he said.

McNabb cited the mine-resistant, ambush-protected all-terrain vehicles for Afghanistan as an example. Industry officials figured they could produce 500 of the lifesaving vehicles a month. When the vehicles first started rolling off the assembly line, they were loaded aboard C-17 aircraft and flown to Afghanistan.

“The question came: If we can build more, can you transport more?” McNabb said.

In the middle of the Afghanistan troop surge, industry officials came to TRANSCOM and said they could produce 1,000 vehicles a month. That ran into TRANSCOM'S requirement to move units into Afghanistan, McNabb said, “and we started looking at different ways to accomplish this.”

The command solved the problem by getting the vehicles to the U.S. Central Command theater of operations via ship and loading them aboard aircraft only for the final leg of the journey. Because it was a short hop, the aircraft carried five M-ATVs instead of three, and they went directly to the units in Afghanistan.

Another example is the opening of the Northern Supply Route. High-value and purely military cargo goes to Afghanistan via air. Other supplies go via ship to Karachi, Pakistan, and then overland into Afghanistan. TRANSCOM forged a series of routes from the Baltic republics, through Russia and the Central Asian republics, or via the Caucasus republics through Central Asia to Afghanistan.

The command took advantage of the contacts that private companies maintain to forge these routes, McNabb said. “That is the real advantage these companies bring,” he said. The

companies have planes and ships, he added, but they also have the network of contacts in the region that allows them to speed the cargo through.

Now, if routes are blocked, other routes can take up the slack, the general said.

Looking ahead, TRANSCOM has the mission of sustaining the servicemembers in Afghanistan while re-deploying the final 48,000 Americans in Iraq by the end of the year.

The command also must plan for contingencies. Last year, for example, TRANSCOM had to provide logistics for the hundreds of thousands of Haitians affected by a massive earthquake and also supported the response to the Gulf of Mexico oil disaster. The command also lifted goods to Pakistan when that nation experienced catastrophic flooding, and had to do all this while maintaining the logistics needed to fight two wars.

Challenges remain, McNabb said, noting that TRANSCOM needs the Services to get new air-refueling tankers. Replacing the 50-year-old KC-135s will save millions of dollars, he added.

The command also is investing in defending its computer systems. About 90 percent of TRANSCOM'S business takes place on unprotected networks, McNabb said, and 33,326 “computer network events” took place against the command last year.

Defense is another priority. “After helicopters, our aircraft are the most shot at,” McNabb said. Last year, he added, 125 aircraft were shot at, and 15 were hit.

As the command continually works to re-invent itself, McNabb said, the TRANSCOM team—active duty and reserve component servicemembers and civilians, along with private industry partners—is always looking for ways to perform the mission better.

DARPA 'Crowd Sources' Combat Vehicle Design

AMERICAN FORCES PRESS SERVICE (FEB. 7, 2011)

Cheryl Pellerin

WASHINGTON—The Defense Advanced Research Projects Agency is leveraging the “power of the crowd” to reduce the time it takes to design and build complex, expensive combat vehicles, an agency official said today.

This computer-aided design image shows the chassis frame to be used in the Experimental Crowd-derived Combat-support Vehicle Design Challenge.

Army Lt. Col. Nathan Wiedenman, deputy program manager for the 6-month Experimental Crowd-derived Combat-support Vehicle Design Challenge, told American Forces Press Service that the crowd includes servicemembers, engineers, members of the public, and others who usually have no way to contribute to military design.

“Soldiers love to give feedback, to put it nicely, about the limitations of their vehicles,” Wiedenman said.

“I spent months in Afghanistan hearing from soldiers about their issues with their vehicles,” he added. “So here’s an opportunity to contribute in a meaningful way to how we can do things better.”

The program will result in a fully functional concept vehicle that should be ready in June, he said, and offers a way to introduce the most innovative ideas for a better performing vehicle.

The agency is working to create a new, faster process for developing future military vehicles. This challenge—conducted with Local Motors, Inc., of Phoenix—is one step in that process.

Local Motors will begin accepting design submissions Feb. 10 and close the process March 3. The competition is open to the public, and designs can be entered using anything from a sketch on a piece of paper to a computer-aided design system. The winner will receive \$7,500, second place \$1,500, and third place \$1,000.

The competition involves use of a lightweight, tubular steel chassis and a General Motors power train from a car called the Rally Fighter built by Local Motors, which developed the vehicle in 2008 using a crowd-sourced process.

Those who take the challenge will use the chassis and drive train and design a vehicle body,” that does the things soldiers need it to do,” Wiedenman explained.

To focus the contributors’ efforts, the challenge offers two mission sets—one is combat delivery and evacuation and the other is combat reconnaissance.

“The intent is not to produce two separate vehicles but to give people something to shoot for,” Wiedenman said.



This computer-aided design image shows the chassis frame to be used in the Experimental Crowd-derived Combat-support Vehicle Design Challenge.

Photo courtesy DARPA

Combat resupply refers to the constant need in the battlefield to bring supplies forward and move people or equipment back, he explained. The challenge for this mission will be to conceptualize a vehicle body design that allows this to be done in the most flexible possible way.

A combat reconnaissance vehicle has to be light and fast. Sighting systems should be mountable on the vehicle. Inside, items such as camouflage and ammunition should be easily stowed but accessible, Wiedenman said.

“Because we realize that not everybody has the military background to understand these mission-set requirements,” he added, “we provided Local Motors with four different fictitious scenarios” that illustrate how the vehicles might be used during each mission.

“In the late 90s during a resupply mission ... we found ourselves low on rations,” one of the fictitious scenarios begins, and tells how weather stranded a group of coalition forces for three days without food or water.

“If we’d had access to a fast vehicle,” the scenario concludes, “they could have provided the necessary supplies within 24 hours, and our mission wouldn’t have been delayed. Fortunately the delay didn’t cost us any lives this time.”

According to the competition description, “The goal of the [concept] vehicle will be to transport items and people around quickly and efficiently in a potentially hostile but mobile environment.”

DARPA has successfully used crowd-sourcing for other projects, Wiedenman noted. In 2009, the DARPA Network Challenge explored the roles the Internet and social networking play in the timely communication, wide-area team building and the urgent mobilization needed to solve time-critical problems.

The Network Challenge winner was the first to submit the locations of 10 8-foot balloons moored at 10 fixed locations in the continental United States.

During the current challenge, the agency and Local Motors will provide feedback to the competitors, Wiedenman said.

"As submissions are received, folks at Local Motors and DARPA will be providing feedback. There will be quite a bit of back and forth," he said. "It's not just one shot and you're done."

After the submissions are assessed, those that meet the challenge requirements will be up for vote on March 3 to 10.

"Everybody who wants to participate can vote on the designs, so it's not just submissions that are crowd-derived, but the winners of the vehicle body design will be crowd-derived," Wiedenman said.

DARPA is investigating potential uses for the concept vehicle, Wiedenman said.

"It's something the larger military vehicle development community will be interested in," he added. "So capturing those ideas and giving [the community] an opportunity to not just see how the competition goes, but see that end result is going to be valuable."

DoD Must Train for 'Degraded' Environments, Official Says

AMERICAN FORCES PRESS SERVICE (FEB. 9, 2011)

Jim Garamone

WASHINGTON—The military needs to do a better job of training to conduct operations in less-than-perfect conditions, the chairman of the Defense Science Board said here today.

Paul G. Kaminski told the Defense Writers Group that given the cyber and space threat environment that exists today and likely will grow in the future, commanders must be ready for these types of operations.

Kaminiski spoke in advance of the Science Board's summer study that will be released shortly.

The chairman of the Joint Chiefs of Staff agrees. In the National Military Strategy released yesterday, Navy Adm. Mike Mullen wrote, "Our ability to operate effectively in space and cyberspace, in particular, is increasingly essential to defeating aggression. The United States faces persistent, widespread, and growing threats from state and nonstate actors in space and cyberspace."

The chairman said the U.S. military, "must grow capabilities that enable operations when a common domain is unusable or inaccessible."

Building workarounds, isolating or cauterizing a cyber attack are things that commanders should learn in an exercise, not on the battlefield, Kaminski said.

"We think we are falling way short in what we need to be doing to look at degraded operations," he said.

Degraded operations are caused by unanticipated changes in the environment and unanticipated changes in how systems perform. They affect a number of Defense Department capabilities, including command, control, and communications systems, and "all of the net-centric activities that we are dependent upon that [are] certainly going to be [attacked] in active cyber ways," the former defense under secretary said.

Degraded operations also will affect U.S. dependence on both orbital and airborne intelligence, surveillance, and reconnaissance assets, Kaminski added.

An enemy could attempt to degrade the environment and attack the U.S. military's reliance on electronic navigation and the American dependence on electronic warfare in general, he explained, and this could reach to trying to disrupt supplies through the U.S. critical logistics infrastructure.

The Defense Science Board looked at what the department is doing to prepare for degraded operations at four levels: the strategic level, the operational level, the tactical level, and the individual level.

"We find differences in the Services at the individual level," Kaminski said. "The Marines still turn off [Global Positioning Systems] and use a map and compass to find their way by dead reckoning. Special operators also do some good training."

But the further up the chain, "the worse it gets as far as training that we do," he added.

When the Air Force first put electronic warfare into its Red Flag combat training exercises, Kaminski said, "they decided not to do it again, because it ruined the whole exercise."

One way to conduct degraded-environment exercises, Kaminski said, is to introduce the environment and grade people on how they react. Another is to keep pushing the envelope until the system breaks. A combination of the two scenarios is necessary, he told the defense writers.

"You need to conduct the break-the-system exercises and put it into the training where we grade people," he said. "This is not a high-cost thing to do. It is a high-opportunity cost, because to do this right, you need to have senior leaders in place to participate so it does place demands on people's schedules. But this needs to be addressed."

Acquisition Chief Urges Congress to Pass 2011 Appropriation

AMERICAN FORCES PRESS SERVICE (FEB. 16, 2011)

Jim Garamone

WASHINGTON—The Defense Department's chief acquisition officer today added his voice to calls for Congress to approve the DoD appropriations bill for fiscal 2011.

Speaking at *Aviation Week's* Defense Technology and Requirements Conference here, Under Secretary of Defense for Acquisition, Technology and Logistics Ashton B. Carter also called for flexibility to get warfighters the equipment they need quickly.

Defense Secretary Robert M. Gates has called for more than a month for Congress to pass the appropriations bill. If the department is forced to operate under a continuing resolution for the rest of fiscal 2011, it would mean an unanticipated cut of \$23 billion. On Feb. 14, Gates called on Congress to pass a bill giving DoD \$540 billion for fiscal 2011.

"It's Feb. 16, and we don't have an appropriations bill for the department for fiscal '11," Carter said. "Each and every program manager in the department is having to upset carefully calibrated plans, stop or slow activities only to start them later, or deferring the commencement of important new programs.

"The result is not only delay," he continued. "It's inefficient and uneconomical to proceed in this herky-jerky fashion with our programs and procurements."

The process now not only is inefficient, "it's anti-efficient," Carter said, noting that the process adds a dollop of cost to everything the acquisition field does.

"Secretary Gates has called this a crisis on his doorstep, and I can tell you that every program manager in the department experiences that crisis in his or her program," he said.

Getting gear and equipment to warfighters operating in Afghanistan is another issue that needs to be addressed, even as Congress debates the fiscal 2012 defense budget request. In 2010, President Barack Obama ordered another 30,000 U.S. troops into Afghanistan, which Carter called "the most austere logistics environment you can possibly imagine."

The last of the surge brigades arrived in August, and 97,000 American servicemembers and another 45,000 coalition troops are serving in Afghanistan.

"Those forces and their commanders have now been there for some months, and they understand what's working, what they need more of, what new capabilities they need," he said. "For myself, the acquisition community and the department, giving them what they need [and] supporting those urgent operational needs is Job No. 1. It comes before all the rest."

Answering these urgent requirements means the department must reprogram funds, acquire the capability, and then field it, Carter told the group.

"But the first step is to obtain funds," he added, "and I mention it because it is another matter we are working with the Congress in these months even as the [fiscal 2012 budget] is debated. These are things that I would like to be able to deliver to the troops in Afghanistan this spring and summer as the fighting season heats up again."

Adjustments Put F-35 on Track, Program Director Says

AMERICAN FORCES PRESS SERVICE (FEB. 16, 2011)

Army Sgt. 1st Class Michael J. Carden

ARLINGTON, Va.—The Defense Department's joint strike fighter program is on track to field the F-35 Lightning II in fiscal 2016, the program's director said here yesterday.

In remarks to the National Aeronautics Association, Navy Vice Adm. David J. Venlet said that although changes made to the program in January extended flight testing and slowed development by about a year at an additional cost of \$4.6 billion, the program has made progress over the past year.

"We're not spending that amount of money in one year, but it's the added content across the years to [2016] that consume the \$4.6 billion," Venlet said. "We have no doubts that achieving fairly high rates of production is obtainable, but it's going to take some discipline on the way."

The fiscal 2012 defense budget request submitted this week has little effect on the program, Venlet added.

"There's no change after [the Feb. 14 budget] announcement, and I believe I've got a very stable requirement," said Venlet, who has led the program since May. "We have not changed our inventory objectives."

The right plan is in place to ensure the program is efficient in terms of cost savings and production, he added, noting that the program has undergone an intense technical review under his watch. The latest restructuring, he said, was realistic, achievable, and based on deep assessments of all aspects of the program.

"Previous plans had shortcomings, but this plan is very resilient," he said. "The plan has been able to overcome spotty parts shortages, engine delivery problems, [and] it absorbed snow days where weather shut down production in the Dallas-Fort Worth area."

Venlet said he has instituted more testing, increasing the number of hours and flights that test pilots fly, having recently increased the mandated number of test flights through fiscal 2016 from 5,800 to 7,700. He's confident, he said, that the additional \$4.6 billion will hold up, as development and testing concludes in 2016.

Competition for the F-35 contract began in 1996. The \$200 billion contract was awarded to Lockheed-Martin in October 2001, and the program immediately went into a 10-year testing and development phase.

The Defense Department plans to purchase 325 aircraft through 2016, and the overall program consists of 2,443 total aircraft in three different variations. The variations include a takeoff and landing variant for the Air Force, an aircraft carrier-suitable version for the Navy, and short takeoff and vertical landing variant for the Marine Corps.

Science Chief Charts Future Technologies

AMERICAN FORCES PRESS SERVICE (FEB. 16, 2011)

Jim Garamone

WASHINGTON—No one argues with the notion that the quality of its people makes the U.S. military the best in the world.

But the equipment servicemembers carry and the science backing them up are another reason for U.S. military pre-eminence, said Zack Lemnios, assistant secretary of defense for research and engineering.

Lemnios gave an overview of the Defense Department's science and technology effort at *Aviation Week's* Defense Technology and Requirements Conference here today.

The United States needs a stronger, more vibrant, and reshaped defense industrial base, Lemnios said, and the nation must understand what lies ahead for science and technology and where to make investments.

"I want to make sure we have the science and technology underpinnings to support the department and the needs of the nation five to ten years from now," he said.

The fiscal 2012 defense budget request provides just over \$12 billion for science and technology, a 3.6 percent boost, Lemnios said, adding that he sees his job as promoting research to leverage innovation.

The department needs to make science and technology investments long term, he noted, and in a fiscally constrained environment officials must learn to "do more without more."

Science can give warfighters the edge, Lemnios said, citing the first flight of the Global Observer at Edwards Air Force Base, Calif., as an example. He said the aircraft is opening up new frontiers in high-altitude aviation.

"The investments that we made just a few years ago have opened up entirely new areas that are driving new technical concepts in unmanned air vehicles," he said. "I think you'll see over the next several years a larger degree of automation, and I think we will see the interoperability of these unmanned systems with manned systems."

The Global Observer has a wingspan of 175 feet, and a body about 70 feet long. The unmanned aerial system flies over 55,000 feet high and has a hydrogen-fueled engine. "The hydrogen propulsion system—a very high-risk concept—is really the keystone of this aircraft," Lemnios said. "It allows for very long endurance with zero emissions and the ability to stay on station for weeks or months at a time."

In all of these areas, DoD is looking for the best ideas and the best people, he said, and is working to find discriminators that open up the best capabilities for U.S. warfighters.

In the basic science area, Lemnios said, he asked his staff, members of academia, and engineers what technologies or sciences have the potential [to] change the landscape for the science and technology community.

"They may not be the natural areas for the department," he added, "but they will have—or they could have— big impacts on the way we think about projects."

The experts came up with six areas: synthetic biology, modeling human behavior, engineered materials, cognitive neuroscience, quantum material, and nano-science engineering. The department has asked for 2 percent annual growth each year through fiscal 2016 to research those capabilities, Lemnios said.

Logistical Drawdown Continues in Iraq

AMERICAN FORCES PRESS SERVICE (FEB. 22, 2011)

Donna Miles

WASHINGTON—Spring is still a month away, but that's not stopping what is likely to be the largest and longest running springcleaning project ever undertaken to prepare for the withdrawal of U.S. forces from Iraq by Dec. 31.

As the combat mission in Iraq officially ended in August and U.S. forces reduced their footprint to about 50,000 troops, President Barack Obama heralded "one of the largest logistical operations we've seen in decades" with the exodus of millions of pieces of military equipment, property, and supplies.

Army Brig. Gen. Mark Corson, commander of the Army Reserve's 103rd Expeditionary Sustainment Command that has overseen that mission, equated it to moving the entire city of St. Joseph, Mo., with all its people, vehicles, equipment, and property to "the other side of the planet." And despite the immensity of the effort, it was completed 10 days ahead of schedule, he said.

Now, with about 2 months left in their deployment, Corson's troops are continuing the logistical drawdown while laying critical groundwork for its follow-on unit to reduce the U.S. footprint in Iraq to zero by the year's end.

The drawdown operation underway now isn't nearly as dramatic as the headline-dominating images of the 2nd Infantry Division's 4th Stryker Brigade driving their convoy of armored vehicles into Kuwait in late August.

But since the launch of Operation New Dawn on Sept. 1, about 3,000 truckloads of equipment and gear have continued to roll out of Iraq, Army Lt. Col. Gerard "Gerry" Schwartz, the command's deputy support operations officer, reported. And in the months ahead, he added, the volume will increase substantially.

Overseeing that effort isn't simply a matter of moving everything from Point A to Point B, Schwartz explained. It requires

identifying what's no longer needed and can be shipped home now, what can be transferred to units in Afghanistan or elsewhere, and what's simply too worn out or costly to transport. Under specifically regulated conditions, the United States can transfer some of its excess equipment to Iraqi security forces.

Three fixed and eight mobile material distribution teams are at work throughout Iraq, helping units to categorize their property items.

"They're sorting through things that are excess ... that might potentially be used for foreign [military] sales to get to the Iraqis," or items that could be returned to the U.S. military inventory, Schwartz said.

As they do so, Schwartz said, they're ever mindful of the need to be good stewards of the taxpayers' money.

"We are certainly aware of how much has been spent in this country and how well we have been equipped, and we want to make sure everything we can possibly get back, that we can continue to use in the [U.S.] inventory, that we do that," he said.

While conducting the logistical drawdown, the 103rd ESC faces another complicating factor: ensuring that troops on the ground have everything they need until the day they redeploy.

"It's a very delicate balance," said Army Col. Kathryn Luna, the command's plans officer. "Our No. 1 mission is to support and sustain the force. So therefore, that mission cannot fail with those 50,000 troops that we have here."

So the trick, Schwartz said, is to move forward with the logistical drawdown without interfering with the ongoing U.S. mission in Iraq.

The command does not want to cause any operational impacts for Army Gen. Lloyd J. Austin III, commander of U.S. Forces Iraq], or anyone else, he said.

"So that is the challenge: making sure we are doing the primary mission, which is training Iraqi security forces, and that we don't lean too far forward on getting things out," Schwartz said.

This also requires the 103rd ESC to forecast exactly how much food, water, fuel, and other commodities it will need to move into Iraq to sustain a downsizing force through Dec. 31, Luna said. The goal is to ship exactly what the force will need, and nothing that ends up being reshipped home.



The logistical drawdown in Iraq made headlines as Stryker armored vehicles of the 2nd Infantry Division's 4th Stryker Brigade Combat Team, pictured here on Aug. 17, 2010, prepared to leave the country as the U.S. combat mission there ended Aug. 31. But the 103rd Expeditionary Sustainment Command continues to oversee the drawdown effort and lay plans for the unit that will complete the drawdown effort by Dec. 31, 2011.

U.S. Army photo by Pfc. Kimberly Hackbarth

"When it comes to sustainment, we know what we need to do based on the number of [military, civilian, and contractor personnel] in theater," Schwartz said. "But we certainly want to make sure that when it comes to fuel capacity or the amount of rations, that we don't overdo it. We have to keep close tabs on that."

And in light of huge and mounting transportation requirements, the sustainers are ensuring that every vehicle that arrives in Iraq with sustainment supplies leaves full of outgoing material.

"It takes trucks to bring supplies in, and it takes trucks to get equipment out of the theater," Luna said. "So when those things are balanced, you are good to go. But it's a very fine line, keeping that all balanced."

Meanwhile, the 103rd ESC is doing the detailed planning its follow-on unit, the 310th Expeditionary Sustainment Command, will need when it takes over the sustainment and logistical drawdown mission this spring, Corson said.

Just as the 103rd ESC arrived in Iraq to carry out a massive drawdown at the end of U.S. combat operations, the 310th will oversee the final drawdown of U.S. forces in Iraq.

"We go home in April, but our commitment is to set the conditions for success for the 310th Sustainment Command as they come here to replace us so that there will be a seamless transition, just as we had a seamless transition back in July to accomplish the mission," Corson said. "And I think that is very important to U.S. Forces Iraq."

Army, Industry Partners Discuss Efficiencies

ARMY NEWS SERVICE (MARCH 1, 2011)

Kris Osborn

FORT LAUDERDALE, Fla.—U.S. Army leaders and their industry counterparts agreed that they can work together to increase productivity and help identify areas of economic efficiency and cost savings in an era of constrained resources, speaking Feb. 25, during a joint panel discussion at the Association of the United States Army Winter Symposium, here.

"We need a strong relationship with our industry partners so they can give us the feedback needed to make the best de-

cisions possible,” said Lt. Gen. Bill Phillips, principal military deputy to the assistant secretary of the Army for acquisition, logistics and technology.

The “efficiencies” discussion was grounded in guidance from Defense Secretary Robert Gates and a Sept. 14, 2010, memo from Ashton B. Carter, under secretary of defense for acquisition, technology and logistics titled “Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending Initiatives.”

Gates’ guidance and the Carter memo call upon the Services to find areas of economic efficiency by eliminating redundancy, moving to more fixed-price contracts, increasing competition among industry partners, and achieving cost savings where possible, among other things.

Essentially, the guidance on efficiency asks the Services to “do more without more,” implicitly recognizing that the overall defense budget is not expected to increase in coming years as it has in recent years.

With these tenets in mind, Phillips emphasized the need for the Army to identify executable and affordable requirements and sound acquisition strategies. Along these lines, he cited the Ground Combat Vehicle Request for Proposal as an example of the Army properly aligning and prioritizing requirements, resources, and acquisition strategy.

The Ground Combat Vehicle Request for Proposal called for a “tiering” of requirements and clear-cut cost goals so that industry would understand what was being asked and have the trade-space necessary to fashion technologically mature solutions able to meet the requirements outlined in the proposal.

Getting this right calls for proper collaboration across a range of stakeholders, Phillips explained.

“We must be output-focused and resource-informed. When we talked about Ground Combat Vehicle, this is what we are getting at. Today for a major program—the acquisition, sustainment, and resourcing teammates must all be actively involved and engaged in the process before we begin to think about requirements generation,” Phillips said.

Another possible area of efficiency centers around looking throughout industry and across the Services to collaborate on weapons production, Phillips said.

“As we work through the efficiencies with OSD [Office of the Secretary of Defense], it’s important that we work with our industry partners,” Phillips said. “If you look at missiles built

by the Army, Navy, and Air Force—are there opportunities for the industrial base or a company to leverage what all the Services require in order to gain efficiencies by using the same production line?”

A key element of the drive for efficiencies is the recognition that much of the cost savings will be re-invested in Army programs, he said.

“The efficiencies that we have gained within our programs, stay within our programs. We expect our [Program Executive Offices] to retain the savings within the portfolio so they can do better things for soldiers within their programs,” Phillips said.

Testing is another area where potential efficiencies can be gained, he said.

“Test is a critical part of every program. We should test to standard. We shouldn’t over-test, but we shouldn’t under-test either. There is a balance when it comes to making sure that you have a viable program that is going through the right testing procedures to validate that the systems we’re fielding are safe and suitable,” Phillips said.

Lt. Gen. Bob Durbin, acting director of the Office of Business Transformation, discussed the importance of looking at enterprise business processes across the Army, emphasizing posturing to effectively and efficiently execute programs across the business enterprise. “Clearly, there are efficiencies to be gained across our enterprise business processes,” Durbin said.

The drive to achieve efficiencies is not intended to result in decreased industry profits, but rather developed to function as a method of incentivizing and inspiring greater industry productivity, panelists said.

“I don’t see efficiency initiatives and profits being mutually exclusive,” said Steve Zink, vice president, Oshkosh Defense strategy and planning.

“It’s achievable to think we can achieve a win-win,” said Mick Maurer, president of Sikorsky military systems.

Osborn is with office of the assistant secretary of the Army for acquisition, logistics, and technology.

Army Pursues Better Buying Power

ARMY NEWS SERVICE (MARCH 4, 2011)

Kari Hawkins

REDSTONE ARSENAL, Ala.—The Army's better buying power—the ability to acquire better weapons systems and capabilities at lower prices—starts with the acquisition professionals who sign defense contracts.

In a September 2010 memorandum to the Army's acquisition community, Under Secretary of Defense for Acquisition, Technology and Logistics Ashton Carter provided guidance in obtaining greater efficiency and productivity in defense spending.

His five major areas for improvements were:

- Target affordability and control cost growth;
- Incentivize productivity and innovation;
- Promote real competition;
- Improve tradecraft in the acquisition of services; and
- Reduce nonproductive processes.

Frank Kendall, Carter's principal deputy under secretary, brought that message in person to Redstone Arsenal's acquisition community during a Feb. 23 town hall hosted by the Army Contracting Command-Redstone. Kendall added the presentation to an already planned trip to Huntsville, Ala., to speak at the annual Defense Acquisition Conference. The town hall, held at Bob Jones Auditorium, neared 650 in attendance.

"We are getting new ideas. We are learning as we go, and we are going to continue to make adjustments," Kendall said. "It's a long journey that we are on. Basically, there's room for improvement. It is imperative for our community to be better at what we do."

"Doctor Carter wants us to be better at acquiring things and spending taxpayer's money," Kendall continued. "We've got to do a better job of getting things into production."

Although Kendall and Carter don't expect a dramatic decline in defense spending, the two executives do believe there will be a gradual decline combined with the Army's commitment to phase out unproductive programs to spend more money on those that are productive.

"We are finding ways to get more with less money," Kendall said, stressing that the Army must learn to work on a tighter budget while still sustaining and modernizing its force strength.

Referring to his own experience as an Army officer, Kendall said in 1971, when he graduated from West Point, the Army was undergoing a "long, slow decline" in spending, cutting out new programs, and suspending modernization of existing programs.

Spending increased dramatically in the 1990s and into the 21st century as the Army played catch-up in fielding systems for battlefield success. But, now, another "long, slow decline" could once again threaten the Army's force structure.

"There is an increase in cost to sustain the force. As equipment gets older, it costs more to maintain," Kendall said. "We will see a big reduction in force or we will see some of the force not modernized at the cost of others."

But the Army's acquisition professionals can have a positive impact on budget constraints by being more efficient and "smart buyers" for DoD.

Kendall, whose military and professional career has spanned the fields of engineering, acquisition and law, presented his audience with an Acquisition Efficiency Guidance Roadmap that outlined Carter's five areas of improvement.

The first area—target affordability, and control cost growth — can be achieved by implementing 'should cost' management, eliminating redundancy in the warfighter portfolio, achieving stable and economical production rates, and managing program timelines.

"Affordability is probably the most important area we should consider," Kendall said. "We canceled a lot of programs because they are unaffordable. But, we've already spent a lot of money on them that we shouldn't have. We should have realized they were unaffordable at the beginning."

"The Army has wasted an awful lot of its money for programs that never went into production. We are going to start treating affordability as a requirement. Affordability is going to become a standard part of the process. It should drive requirements. It should drive desire."

The second area—incentivize productivity and innovation— can be achieved by rewarding contractors for successful supply chain and indirect expense management, increasing use of fixed-price incentive firm contracts, capitalizing on program payment structures, instituting a superior supplier incentive program, and reinvigorating industry and independent research and development.

"We want industry to be leaner," Kendall said. "We want to pay direct costs. We need to attack that. We have to get industry to eliminate indirect costs as much as possible. We want industry in a position where they work hard and they get a reasonable profit."



Frank Kendall, principal deputy under secretary of defense for acquisition, technology and logistics, tells Redstone Arsenal's acquisition professionals that they are the watchdogs for taxpayers' money and that they should work to bring costs down on all Army contracts.

Photo by Ellen Hudson

Promoting real competition, the third area, is accomplished by emphasizing a competitive strategy at each program milestone, removing obstacles to competition, and increasing the small business role and opportunities.

"There are a lot of things you can do to keep that competitive environment," Kendall said, encouraging acquisition professionals to open competition to small businesses.

"Small businesses tend to be lean. Their overhead is low, and they are hungry. They are also a good source of a great deal of innovation. Small businesses can bring a lot to the table."

The other areas—improve tradecraft in the acquisition of services and reduce nonproductive processes—rely on the professionalism of acquisition employees to address internal issues that drive up costs.

"Congress keeps imposing things at the top. But I don't think our problems are at the top. The problems are at the grass-roots level with execution," Kendall said.

"At the end of the day, you should do as good a job as you can to drive costs down. You're professionals. We are counting on you to protect the taxpayer's money."

Hawkins is with U.S. Army Garrison, Redstone Arsenal, Ala.

Shadow Defies Gravity With Success

ARMY NEWS SERVICE (MARCH 4, 2011)

Kari Hawkins

REDSTONE ARSENAL, Ala.—An unmanned aircraft system in the Army's fleet today is defying gravity, soaring ever higher in performance, and zooming down on cost.

And, in a budget-conscious Department of Defense, exceeding performance and cost goals are enough to make the RQ-7B Shadow 200 Tactical Unmanned Aerial Vehicle a target for recognition.

Such was the case last fall when Shadow won the prestigious Performance Based Logistics Award from the Secretary of Defense. According to the award nomination package, the Shadow PBL contract achieved exceptionally high readiness with the system, while simultaneously reducing its costs and improving its reliability.

But such recognition doesn't mean the Shadow is coasting on its merits. Rather, its government-contractor team is honed in on even better performance and cost savings.

"We've taken cost very seriously and we've indoctrinated a lot of things into Shadow to bring those costs down. We've also decreased incident rates," Todd Smith, deputy product manager for Shadow, said of the 43 Redstone Arsenal-based

employees whose work is centered on product development, sustainment, cost, scheduling, performance, and other life cycle management issues pertaining to Shadow.

Described as the “workhorse” of the Army’s unmanned aircraft systems, Shadow has exceeded 600,000 combat hours in Iraq and Afghanistan since it was introduced to the Army fleet in 2003, flying missions for the first time during the U.S. invasion of Iraq. The Army has fielded 98 Shadow systems, and the Marines 11. Its mission in unmanned, over-the-horizon reconnaissance, surveillance, and target acquisition has made it a forerunner in providing situational analysis to soldiers on the battlefield.

Even so, those early Shadow years did present challenges.

“The Shadow has been the Army’s first and most successful unmanned aircraft program of record,” said Col. Gregory Gonzalez, project manager for unmanned aircraft systems, program executive office for aviation.

“The program followed on the heels of other UAS programs that tried to do too much, too soon, failing in the process,” Gonzalez explained. “Shadow’s initial success was based on getting a simple capability quickly into the hands of the soldiers.”

Unfortunately, the simplicity in design caused problems with reliability, Gonzalez said. Early accidents of the Shadow system reached a rate of more than 400 per 100,000 flight hours.

“Even as the first systems were fielded to warfighters, the product manager embarked on a strategy to improve the capability and reliability of the system,” Gonzalez said. “Early reliability improvements were easy to identify and fix. Over time it became much more difficult to build in reliability in a cost-effective way, but the Shadow team pressed on and has done a miraculous job. The cumulative impact of these improvements is monumental.”

For the quarter ending in December 2010, the Shadow fleet achieved the lowest accident rate in its history, approaching 29 incidents per 100,000 flight hours.

“It continues to fly unprecedented flight hours in theater,” Gonzalez said.

Not only have the number of incidents been drastically reduced, so, too, have been the expense of repairs when incidents do happen.

“I think we can claim we’re saving \$5 million a year in aircraft repair,” Smith said. “I think that’s a very conservative number. It’s hard to say. But we used to have this amount of mishaps costing at least \$5 million a year.”

Engine improvements have been the key to Shadow’s increased reliability. In 6 months, accidents due to engine problems were reduced by 50 percent.

“Engine improvements led to the lowest mishap rate in the history of the Shadow,” said Kristen Regula, who as quality lead for Shadow works with reliability engineer Ed Rymut on engine performance issues. “And, when we talk about preventing a mishap, we are saving \$100,000 per mishap.”

The Shadow uses a 40-pound, 40-horsepower engine on missions that put a lot of stress on its engine.

“It’s the only engine in the world that works with the constraints of high performance, high stress, and weight issues. The reason it has had reliability issues is because of what we are asking it to do,” Smith said.

Engine improvements addressed carburetor icing, which occurs when Shadow flies in airspace ranging in temperature from 25 to 45 degrees Fahrenheit, Rymut said. The improvement involved installing a heated throttle plate carburetor. In addition, the Shadow’s oil pump was modified so that it could continue to pump oil at cold temperatures.

“Before the oil pump was modified, we had to restrict the Shadow based on temperature limitations,” Rymut said.

“When it goes up in altitude, the air gets very cold quickly. So, Shadow was very limited in its mission. With the new oil pump, we were able to expand the mission significantly. Now, the Shadow can fly higher for a longer period of time, and it can fly in nearly all weather conditions in the winter months.”

The product office has also incorporated post-flight inspections, requiring that a field service representative check Shadow engines after each flight.

“Twenty-one to date have been saved because of post-flight inspections that detected metal shavings, which means something failed internally in the engine,” Regula said. “Ten of those 21 would have resulted in a mishap if they had flown again.”

Instead, those engines were replaced so that the Shadows could continue their mission.



Soldiers in Iraq prepare RQ-7B Shadow 200 for launch from a trailer-mounted pneumatic catapult. The “R” is the Department of Defense designation for reconnaissance while “Q” means unmanned aircraft system, “7” refers to it being the seventh of a series of purpose-built unmanned reconnaissance aircraft systems, and “B” represents improvements over the previous A model.

U.S. Army photo

With as much flying as the Shadow does in battlefield conditions and often under poor weather conditions involving sand and heat on launch and landing, and cold temperatures at high altitudes, “engines will continue to deteriorate and, if not detected, result in a mishap,” Regula said. “But we know what will deteriorate and what to look for, and we can replace the engine before a mishap occurs.”

The Shadow’s performance was also improved with the incorporation of a larger parachute, which was designed to decrease its rate of descent while also increasing weight and reliability, said Zach Zimmerman, system safety engineer for Shadow.

“We reduced the direct rate of descent from 45 feet per second to 30 feet per second,” he said. “In addition, the parachute designed for earlier variations can only support a payload of 300 pounds. We were able to increase that payload to 400 pounds while working the descent rate exercise.”

The parachute, now doubled in size, also “incorporated innovative and advanced technologies—like advanced packing techniques and deployment techniques—to minimize the weight of the system,” said Jason Lucas, the Shadow’s technical chief.

“The deployment of the parachute is very critical. We used six variants of older version Shadow aircraft in a controlled test environment to ensure that the new deployment mechanism worked.”

In use since June 2009, the new parachute is more effective in controlling a smooth landing for the Shadow. Smoother landings mean more affordable repairs if there is a mishap.

“When we do have a mishap, the parachute lessens the impact so that repairs aren’t as expensive,” Regula said. “Instead of \$280,000 to repair a Shadow, it costs \$100,000.”

Steps have also been taken to “error proof” Shadow operations, minimizing the effect operator mistakes can have on the system. Automation has been incorporated in the system, and serves to check the system during pre-launch to ensure soldiers follow all steps for a successful Shadow launch.

“We’ve investigated every mishap we’ve had and what’s caused those mishaps, whether they are operator-related or material-related,” Lucas said. “We’ve instigated several advance technologies, and hardware and software solutions.

We've increased automation, and decreased soldier interaction and burden during the last three years. We've reduced operator workload and decreased the mishap rate."

The improvements are part of the growing pains that go along with a new system that is popular with soldiers.

"As we fielded more and more units, soldiers determine new things to do with them, and we are finding ways to incorporate those new missions to better serve the soldier on the battlefield," Smith said. "For example, we've added an avionics and communications requirement to support soldier requests."

"Some of our solutions have been very high-tech and innovative," Lucas added. "We are using state-of-the-art battle technologies to provide a long duration of power in a lightweight package."

"Other solutions use simple technologies, such as instituting a break-away cable to solve problems with cables that tangled in the engine at launch. We look for the right solution to the problem, not necessarily the most expensive and highest tech."

"The Shadow has been the Army's first and most successful unmanned aircraft program of record ... The program followed on the heels of other UAS programs that tried to do too much, too soon, failing in the process. Shadow's initial success was based on getting a simple capability quickly into the hands of the soldiers."

—Army Col. Gregory Gonzalez
Project Manager for Unmanned Aircraft Systems
Program Executive Office For Aviation

Along the way, the Shadow's flight endurance has gone from 5 hours to 9 hours, which decreases the number of Shadows needed to field a battlefield exercise. The Shadow's mission has expanded to include night-time reconnaissance, laser tagging of buildings, and communications capabilities from Shadow operators to ground troops. Future capabilities will include arming Shadow with a weapon system and communications systems connecting it to manned aircraft.

"The technologies that we've incorporated have expanded the system significantly," Smith said.

Now used at the brigade level, the Shadow management team said there is a potential for more Shadows to be fielded to brigade combat teams as the Army looks for ways to "fill the gap between local tactical reconnaissance and strategic-level reconnaissance," Smith said.

As long as the team "continues to maintain reliability as a top priority, as long as we stay focused on reducing life cycle maintenance and improving reliability, the Shadow will have new mission possibilities," Lucas said.

"If we continue to invest in technologies like we have in the last five years, Shadow will take giant leaps forward in its mission and its contribution will continue to be significant."