The Publication of Record for the Military Logistics Community

Military Logistics Forum

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SPECIAL PULL-OUT SUPPLEMENT

Logistics Advocate

Lt. Gen. Raymond V. Mason

U.S. Army Deputy Chief of Staff, G-4

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MLF

May 2012
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Exclusive Interview with:
COL. ALLAN E. DAY
Commander
309th Maintenance Wing
Ogden Air Logistics Center

Self Diagnostics ✯ Shelters ✯ Smarter Cargo Drops
Supply Chain Excellence ✯ Life Cycle Management Roundtable

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By Peter Buxbaum

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U.S. Army
Deputy Chief of Staff, G-4

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EDITOR'S PERSPECTIVE

Jeffrey D. McKaughan
EDITOR-IN-CHIEF

Acquisition reform means different things to different people, but to me, the bottom line is that if competition is fair, balanced and delivers the best value to the warfighter, then it gets the job done. But what is best value to me may not be best value to you.

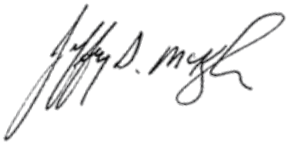
Does every solicitation have to result in a competition? Is it possible for a noncompetitive contract award to still be, by definition, fair and justified? The DoD Inspector General's (IG) office recently looked at noncompetitive contracts awarded by Army Contracting Command-Rock Island Arsenal (ACC-RIA). The good news from the story is that while the Army—and DoD in general—would prefer contracts to be open and competitive, accepted business practices and best value can be delivered and justified from a noncompetitive award.

According to the IG, between fiscal year 2009 and FY10, ACC-RIA awarded 188 noncompetitive contracts with an obligated value of about $2.3 billion. These awards included contracts of all types, including indefinite delivery contracts. Of those 188, they focused on 26 specific contracts, all from the Joint Munitions and Lethality Life Cycle Management Command (Rock Island), valued at almost $543 million.

There are seven exceptions allowing the award of a contract in circumstances other than full and open competition. The IG noted that while not every "i" was dotted or "t" crossed, the contracting staff at Rock Island fulfilled their obligations and provided enough information to support a decision to when it rendered an noncompetitive award.

The report is a reflection of the professionalism of the ACC-RIA contracting team and their pursuit of a system that delivers best value and is efficient. It also casts light on the noncompetitive award process and highlights that it not only can deliver best value but that it can withstand the scrutiny of focused review.

To follow up with this, we secured an interview with Brigadier General (Promotable) Gustave F. Perna, commander of the Joint Munitions Command and of the Joint Munitions and Lethality LCMC, for the next issue of *Military Logistics Forum*.



Any thoughts on the value of noncompetitive contracts? Are they useful or do they not do justice to the needs of the warfighter?

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"We are pleased to be working together to establish a more unified front for our customers," said Rick Hansen, vice president and general manager of GSE Americas. "We have a proven track record with the design and implementation of innovative solutions for ground support equipment to service the aerospace industry."

"Hobart Ground Systems has the track record, expertise and background to provide improved solutions for our customers worldwide," said Hansen. "Each of these formally separate companies has developed new products launching over the new few months. We have the talent to make this new and improved company the leader in power and PC Air solutions to the industry."

Budget Cuts

Some modernization programs may be delayed, but not reduced or cancelled due to a tightening of the budget, senior Army leaders told senators in Washington, D.C. Secretary of the Army John McHugh and Army Chief of Staff Gen. Raymond T. Odierno testified to the Senate Appropriations Committee subcommittee on Defense regarding the service's fiscal year 2013 budget request.

"We had to slip some of the procurement programs to the right," McHugh told lawmakers about the Army's rotary-wing aircraft fleet. Modernization of Apache helicopters is down to 48 per year, Odierno said. Some CH-47 Chinook performance upgrades will be reduced, he told senators.

UH-60 Black Hawk modernization will be delayed in all components: the active force, Army Reserve and National Guard, Odierno said. The procurement of 72 UH-60M helicopters will be moved at least six years, outside the current procurement objective memorandum, he said.

No final decision has been made on the C-23 Sherpa program, Odierno said. But he said the Army has some issues with the older aircraft that it doesn't quite fill the Army's requirement for intra-theater transport.

Modernization of the C-23 is projected to cost $800,000 to $1 million per aircraft, McHugh said. "That program has some real dollars attached to it," he told senators.

McHugh explained that the Army had identified a requirement for intra-theater airlift. The C-27 Joint Cargo Aircraft program was one of the solutions, he said. The Army had initially planned that program jointly with the Air Force. Then the Air Force assumed full responsibility for the program before deciding that the intra-theater airlift could be accomplished using C-130s. Odierno said the Army is working with the Air Force on the requirement.

PEOPLE

Compiled by KMI Media Group staff

Rear Admiral William A. Brown will be assigned as director, strategic, policy, programs and logistics, J4/5, U.S. Transportation Command, Scott Air Force Base, Ill. Brown is currently serving as director, logistics and security assistance, J4, U.S. European Command, Vaihingen, Germany.

Navy **Captain Douglas G. Morton** has been nominated for appointment to the rank of rear admiral (lower half). Morton is currently serving as chief of staff to the commander, Naval Facilities Engineering Command, Washington, D.C.

Navy **Captain David R. Pimpo** has been nominated for appointment to the rank of rear admiral (lower half). Pimpo is currently serving as deputy commander for fleet logistics operations, Naval Supply Systems Command, Mechanicsburg, Pa.

Navy **Captain Donald L. Singleton** has been nominated for appointment to the rank of rear admiral (lower half). Singleton is currently serving as chief of staff, Naval Supply Systems Command, Mechanicsburg, Pa.

Brigadier General David W. Allvin, who has been selected for the rank of major general, vice commander, 618th Air and Space Operations Center (Tanker Airlift Control Center), Air Mobility Command, Scott Air Force Base, Ill., has been assigned to commander, 618th Air and Space Operations Center (Tanker Airlift Control Center), Air Mobility Command, Scott Air Force Base, Ill.

Brigadier General Giovanni K. Tuck, commander, 379th Air Expeditionary Wing, Air Combat Command, Southwest Asia, has been assigned to commander, Defense Logistics Agency-Distribution, New Cumberland, Pa.

Major General Barbara J. Faulkenberry, director, logistics, Headquarters U.S. Africa Command, Stuttgart, Germany, has been assigned to vice commander, Eighteenth Air Force, Air Mobility Command, Scott Air Force Base, Ill.

Brigadier General Lawrence M. Martin Jr., vice commander, Eighteenth Air Force, Air Mobility Command, Scott Air Force Base, Ill., has been assigned to vice commander, 618th Air and Space Operations Center (Tanker Airlift Control Center), Air Mobility Command, Scott Air Force Base, Ill.

Colonel James C. Vechery, who has been selected for the rank of brigadier general, deputy director, operations, Headquarters Air Mobility Command, Scott Air Force Base, Ill., has been assigned to deputy director, strategic plans, requirements, and programs, Headquarters Air Mobility Command, Scott Air Force Base, Ill.

Colonel Blaine D. Holt, who has been selected for the rank of brigadier general, director, Secretary of the Air Force and Chief of Staff of the Air Force Executive Action Group, Headquarters U.S. Air Force, Pentagon, Washington, D.C., has been assigned as director of logistics, J4, Headquarters U.S. European Command, Stuttgart-Vaihingen, Germany.

Life Cycle's Changing Role

Or will its role change?

Does everyone understand the relationship between initial acquisition costs and life cycle costs? It is hard to believe that you could find anyone in acquisition and contracting who is not fully aware of where the larger program funding amounts will fall. However, just because everyone understands the relationship doesn't mean that the challenges in tight budget times are met in the same way and with the same considerations.

***Military Logistics Forum* recently had the chance to ask for input on the topic from several key people who deal with life cycle issues on a daily basis. We asked them to address the role life cycle management has and how it will change in a budget constrained environment.**

AAI Logistics and Technical Services
Mark Hitch
Senior Director Business Development
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The U.S. Department of Defense is sustaining its legacy systems years longer than projected. Further budget reductions will place an even greater emphasis on life cycle management. The prevailing danger is creating an uncontrolled sustainment cycle with no exit strategy. Supply chain management with decreased stocks, spares replacement with vanishing vendors, and obsolescence that requires reverse engineering of spares drive up the cost of sustainment, even while the goal is operating with a reduced budget. Often, legacy systems will be upgraded in order to slip the schedule for replacement while increasing combat capability; however, programmed replacement dollars can vanish in an attempt to sustain the aging primary platform, as well as its obsolete support and training equipment.

At AAI Logistics & Technical Services, we provide low-cost sustainment services with a defined exit strategy that accounts for future system replacement. Key elements of this approach are:

- Low-cost replacement parts and form, fit and function substitutions
- Medium- and long-term fee-for-service engagement for the aging DoD infrastructure in the area of test equipment
- Public-private partnerships addressing obsolescence and a limited supply base
- Real-time models for forecasting, reliability analysis, and inventory management and placement
- Performance based logistics programs that integrate hardware, software and human intervention throughout the life cycle to optimize usability, availability, maintainability, sustainability and affordability
- Metrics-driven decisions based on a meaningful user outcome measure

In summary, budget reductions will encourage greater creativity in sustainment of legacy systems and support. We have embraced and implemented these strategies already, and have already seen the benefits they provide to the budget-conscious customer.

Gartner Inc.
Jane Feitler
Research Director
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Life cycle management (LCM) must strengthen four capabilities to respond to the new environment.

A more collaborative product design environment is required, such as including direct material sourcing suppliers in the design process. Supplier innovations can be anticipated and planned for. Use product life cycle management (PLM) technology to provide a shared product portfolio management framework within a service to enable improved design and development. Methodology, technology and innovative ideas are shared and utilized. Computer-aided engineering incorporating digital manufacturing facilitates more rapid modeling, simulation and prototyping.

The services' ERPs and other networked systems can better share information to optimize the entire supply chain. With improved use of spend management and supplier segmentation now available with ERP-generated data and other technology tools, spending can clearly be identified and better managed. Strategic suppliers are identified and leveraged across a service, if not services. Improved sourcing decisions, using spend management information, generate significant cost savings.

Collaborative planning must improve. LCM is in the early stages of utilizing commercial practices in sales and operations planning (S&OP) in order to align resources and requirements. DLA and the services are working toward linking processes cohesively together to match supply with demand. People in the plan, source, make/repair, deliver and return functions need to be involved to help make the best decisions. Recognize that effective S&OP aligns with short-term, mid-term and strategic planning horizons.

Contracting methods are already evolving to more PBL and less CPFF or CPAF, but clauses incentivizing innovation and cost reductions will become the norm. Cost pressures will force transactional relationships to become more streamlined and automated. To improve RAM while also gaining cost control and cost reductions, LCM needs to shift to more partnership-based, win-win relationships with strategic suppliers, without either party suboptimizing in favor of the other.

ITT Exelis
Doug Doerr
Logistics Manager,
Communications and Force Protection Systems Division
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When defense budgets are constrained and the mission still needs to be accomplished, the available funds tend to be directed at maintenance and refurbishment of the installed assets. Further, rather than new start or large scale acquisitions, the limited funds may be directed to leverage the existing inventory via engineering changes to add capability that the warfighter needs to effectively prosecute the mission.

Currently reset operations and the wartime operational tempo have driven the need for spares; as we withdraw from active combat situations and complete the reset of the force, the demand for spares should drop. Unfortunately, over time fewer demands for the spares combined with a drive to reduce inventory carrying costs will result in purging perceived "excess" spares stock from inventory. In addition, constrained defense budgets are also frequently accompanied by shrinkage of the industrial base. These factors lead to installed systems that are more expensive to maintain if effective supply chain management programs are not implemented.

Performance-based logistics (PBL) programs leveraging the original equipment manufacturer (OEM) is one option that may address many of these issues. A properly structured PBL-support arrangement can reduce risk to the government, move the inventory costs to the PBL providers, and provide a method to maintain an adequate industrial base. Assuming the measures used to evaluate the effectiveness of the PBL arrangement include operational availability of the weapons system combined with specific maintenance response and supply turn-around times, the OEM will need to maintain a capability to provide the needed spares by managing the production and supply chain to ensure that inventory is on-hand, parts obsolescence is identified and effective measures (e.g., last time buys, redesigns or incorporating technology) are implemented to mitigate the impact to our war fighting capability.

U.S. Army TACOM LCMC
Randy Talbot

After 10 years of continuous combat, the U.S. Army TACOM Life Cycle Management Command (LCMC) faces uncertain budget cuts, supporting operations overseas, responsibly returning equipment from overseas and preparing it for future use—all while leading the Army in modernizing its vehicle fleet. This is a position that TACOM has seen many times.

The TACOM LCMC is founded on effective integration of acquisition, logistics and technology processes. The Lean Six Sigma approach is the primary vehicle for fact-based decision-making and continuous measurable improvements. The TACOM LCMC community uses Lean Six Sigma every day to eliminate waste, operate more effectively and become organizationally efficient.

Our mission and role today is still similar to that of our command more than 70 years ago. TACOM LCMC traces its origins to the establishment of the Tank-Automotive Center (TA-C) September 1, 1942, to manage the Ordnance Department's enormous automotive production and distribution program.

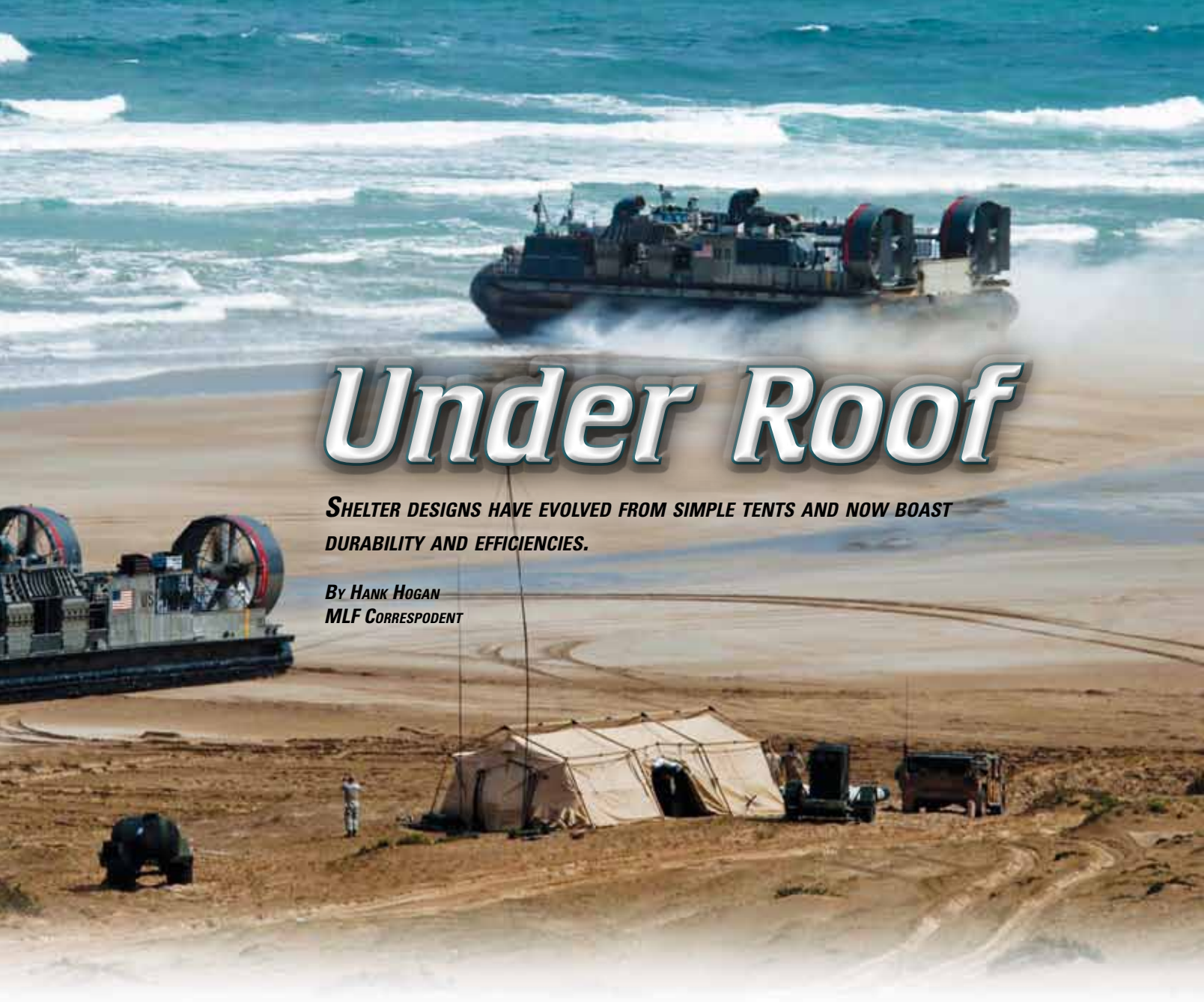
The original mission of the Tank-Automotive Center (and subsequently the Office, Chief of Ordnance-Detroit) was to "supervise the development, engineering, procurement and manufacture, storage, issue to troops, maintenance in the field, and ultimate disposition of scrapping of the automotive equipment used by the armed forces." During World War II, the TA-C spent nearly 50 percent of all funds allocated to the Ordnance Department. It directed the production of more than 3 million vehicles, ranging from bicycles to 70-ton tanks. Today, TACOM is a major subordinate unit of the Army Materiel Command.

The Army's current vehicle fleets need maintaining and modernizing for the Army to protect the nation's interests. Transitioning to the Brigade Combat Team force structure can meet the Army's objective of deploying a specially trained, ready-to-fight brigade anywhere in the world in 96 hours. The Program Executive Offices and TARDEC are creating vehicle concepts with characteristics and features designed to meet known and potential future threats.

With more than 70 years of experience to draw upon, TACOM LCMC is well equipped to help the Army and achieve its force modernization goal of developing lighter, more lethal and more survivable vehicles, while at the same time maintaining the current fleet. Achieving these present responsibilities and future goals continues to require a strong working relationship with the private sector, especially the American automobile industry and the TACOM LCMC defense contracting partners.

The original motto of TACOM was "More Than Enough, On Time, Wherever Needed." Our current motto is "Committed To Excellence." We continue to stand by these. ★

For more information, contact Editor-in-Chief Jeff McKaughan at jeffm@kmimediagroup.com or search our online archives for related stories at www.mlf-kmi.com.



Under Roof

Shelter designs have evolved from simple tents and now boast durability and efficiencies.

By Hank Hogan
MLF Correspodent

The old real estate adage applies, even when talking about places halfway around the world. In Afghanistan, it's still all about location, location, location. That truism has an impact on shelters and all the gear that makes them a home—or an office, a hangar, or some other space—away from home.

In Afghanistan, forces face extremes of heat and cold, as well as sandstorms and other punishing weather. What's more, the warfighters sit in a landlocked country. Supply lines are long overland routes that snake through sometimes hostile territory. Thus, the goal is to build shelters that are easy to set up and take down, provide protection and reduce the logistics footprint. Some of the first steps toward these are being field trialed this summer in Afghanistan.

"We've teamed up with the warfighter on the ground to evaluate the benefits of incorporating energy efficient systems and products into the 150-sized force provider expeditionary base camps," said Major John Pires. Pires is assistant product manager for shelter systems within product manager force sustainment systems, which is part of the PEO Combat Support and Combat Service Support in Warren, Mich.

This represents the first time that technologies such as solar shading, insulated liners, right sizing of heating and air conditioning systems, and an interconnected microgrid as a whole system are being evaluated for their effect on base camps, according to Pires. He added that some of these methods had been investigated on an individual tent level and for tactical operations centers.

As for their impact, solar shading alone can reduce energy needs by 22 percent in the summer months, studies have shown. Properly designed and constructed, these shades can provide this benefit without adversely impacting setup or takedown time or the manpower needed for either.

Meanwhile, a microgrid can save fuel by adjusting generator output on-the-fly to match demand, said Product Manager Force Sustainment Systems Chief Engineer John Munroe. "Between one in the morning and five in the morning, power needs are lower. People are sleeping, so we could shut down and save additional fuel."

The future could see the use of energy-efficient LED lighting, solar water heaters and water reclamation, as well as energy harvesting from incinerators, the sun and other sources. Over the next five years, the

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deployment of these technology packages could cut fuel consumption in half and water resupply by 90 percent.

Force protection has not been forgotten in all of this. A modular ballistic panel system will provide protection that is equivalent to that of a Kevlar helmet against small arms and other kinetic weapons, Pires said.

Vendors are responding to these demands for more efficient yet still easily deployable shelters. For instance, Orangeburg, N.Y.-based DHS Technologies has a series of soft-walled shelters that are modular, scalable and easily deliverable. They also have an integrated liner, which adds insulation and reduces both heating and cooling demands. For energy efficiency, the key is not the shelter but the digitally controlled generators that the company supplies as part of its overall solution.

"The most important innovation is being able to deploy generators in a grid rather than each as an individual island," said Ron Houle, vice president of government relations for DHS Technologies.

He noted that this is particularly beneficial in tactical settings. Typically, in such situations, a quick and easy setup is highly desirable, which makes some techniques, such as extensive sun shading, less of an option. Thus, the biggest payoff is in a more efficient, smarter, grid-connected and situation-aware generator, Houle said.

Of course, generators are only useful if they actually come on when needed. Art Breithaupt, vice president of sales and marketing for Cadillac, Mich.-based AAR Mobility Systems, said that years ago problems with starters and sand might limit useful lifetimes of generators to less than 7,000 hours of operation, or less than a year of continuous use. Today's generators are sealed against the environment and that pays off.

"We're having generator systems come back today from the desert with 25,000 or 30,000 hours on them," Breithaupt said.

Generators built to the company's specifications are embedded within its shelters. AAR Mobility makes a line of hard and soft wall shelters, with some specifically designed to fit within the envelope of a C-130 and to be locked into the cargo system. That cuts loading and unloading times, reduces loading space, and contributes to lower fuel consumption getting them into and out of theater. Once deployed, the shelters can be fully operational within minutes. Because they have on-board generators and environmental control units, they are self-sufficient and provide a stand-alone capability, Breithaupt said.

Today's shelters are designed for a wide range of environmental conditions and to ease construction requirements on personnel including the need for external equipment. [Photo courtesy of DoD]

As for the future, he'd like to see an even greater shrinking of the logistics footprint. One possibility would be the use of solar power, thereby allowing shelters and the warfighters within them to live off the land.

Today, size and weight considerations make it impractical for solar panels to satisfy heavy duty power needs. However, that hasn't kept vendors and the services from experimenting and producing some promising results for less demanding applications.

For instance, Utils USA of Fort Walton Beach, Fla., has been working with the U.S. Air Force on laminating solar panels into a secondary insulating barrier that goes over the frame of the company's soft wall shelters. Adam Bement, business development manager, noted that the frame had no problem supporting this additional weight.

Tests at Holloman Air Force Base showed that approximately three kilowatts of power could be generated this way, enough to run lights and to power—or to recharge—a device or two. Coupled with the insulated liner, which cuts power consumption by 26 percent, the result could be a reduction in power consumption by up to 50 percent, Bement said. One consequence would be significant fuel savings, especially if every shelter in a camp were equipped in this way.

In addition to such innovations, careful attention to design can also pay off, particularly when it comes to the most power hungry equipment, Bement said. "Our shelter is more of an apex design, which means there is less unusable interior space. This allows the ECU (environmental control unit) to cool the Utilis shelter more efficiently than some."

With regard to Afghanistan, he noted that its cold winters, hot summers and rapid weather changes present challenges for soft wall shelters. Utils USA addresses such issues through the use of a thick wall extruded aluminum frame and PVC-coated material, a combination that allows the shelter to withstand the sometimes harsh conditions.

HDT Global of Solon, Ohio, makes soft wall shelters using folding frames and high pressure air beams as support structures. The latter was developed primarily for large base camp applications, enabling two soldiers to do the work of a dozen in erecting a structure, said Mike Stolarz, vice president of business development. In half an hour or so, a handful of warfighters can put up a hanger with a 40-foot span for an unmanned aerial vehicle or a small helicopter, a task that in the past could have taken days or weeks.

As for efficiency improvements, one of the best approaches is to make the heating and cooling gear as power stingy as possible. The company has found that better insulation of the shelter allows the scaling back from an eight to a five ton or even

smaller cooling unit. This represents a savings of just under 40 percent or more, depending on the exact situation.

For those times when heat is required, a thermal electric self-powered heater and some troop training about when to shut off environmental control units may be the best solution, Stolarz said. He explained that the design of the latter is such that they struggle when outside temperatures dip below freezing. One solution would be to shut them down, turn off any no longer needed generators and thereby reap some significant benefits.

"A general comparison would be about .25 gallons an hour, compared to three gallons running a generator powering an ECU, is what that self-powered heater uses to push the required amount of BTUs and heat that shelter," Stolarz said.

Sea Box of East Riverton, N.J., specializes in new designs, modification and manufacture of intermodal, or ISO, containers. These are the standardized steel boxes used to ship freight around the world via trucks, trains and boats. It's no wonder, then, that the company's collapsible redeployable hard wall shelter fits within this footprint. It expands into a structure with two levels of floor space, R22 polyurethane foam insulation and an integrated heating and cooling unit, as well as electrical fixtures and USB charging outlets.

The design seeks to ensure that everything needed is in the structure. Achieving that goal is important given the realities of Afghanistan, said Sales Manager Bob Welsch. "If you can keep everything within that footprint of the ISO container, you're pretty much making it easy for the warfighter."

If anything necessary is not present, getting it into theater may be difficult, he added. "It's not like you have a Home Depot to run down to."

Finally, there are some really big shelters, such as large structures intended for aircraft maintenance. In Afghanistan, some of these have been built in a partnership between Rubb of Sanford, Maine, and Cocoon of North Hampton, N.H. The frame can either be lightweight aluminum suitable for air transport or a heavier steel construct.

Chip Crotty, president of Cocoon, noted that the hangers use specially-made PVC-coated fabric for the walls. These can last as long as 20 years, despite prolonged exposure to the sun, wind, snow and sand. The use of this type of fabric leads to a durable structure that can stay in place as long as needed and yet can still be taken down if, and when, it comes time to move on.

The fabric also offers an unexpected green benefit: If insulation is not needed, a translucent material can be used in the roof, thereby providing fuel-free lighting. Another plus is that the material doesn't support combustion. Walls that don't burn translate into a different kind of increased efficiency.

"You only have to design a fire suppression system to fight content. That's probably 50 percent less than a traditional fire suppression system," Crotty said.

In all of these efforts to make shelters easier to deploy and more efficient, there are limits to what is feasible, given mission constraints. For instance, hardening soft wall shelters against extreme temperatures makes the most sense if the R value of the insulation is between three and six, the Army's Pires said.

At the low end the thermal resistance is about the same as fiberglass batts, while at the high end it is equivalent to the performance of closed cell foam. The upper limit is set by the need to pack and ship shelters into and out of country, which means they must not be too bulky. The lower bound is driven by the benefit of improving R value.

Of course, rigid wall structures offer even higher R values. However, they often take more resources to move and set up, and this has to be balanced against their advantages. In all cases, what's important is what's in the shelters, not the shelters themselves.

As Pires said, "The warfighter cares that they're living in a structure that will protect them from the elements and when they flick on the light, the light turns on. What we'd really like is to incorporate all these different technologies and make it totally transparent to the warfighter." ✶

For more information, contact Editor-in-Chief Jeff McKaughan at jeffm@kmimediagroup.com or search our online archives for related stories at www.mlf-kmi.com.

Supply Chain Excellence

SUPPLY CHAIN MANAGEMENT WON'T SAVE EVERY DOLLAR, BUT IMPROVING THE PROCESS WILL IMPROVE THE BOTTOM LINE.

BY PETER BUXBAUM
MLF CORRESPONDENT

United States military and government agencies charged with providing supplies to warfighters by their nature seek to enhance the efficiency and lower the costs of their operations. But the prospect of significant cuts to the defense budget has placed an even greater emphasis than usual on using supply chain management to reduce costs and enhance value.

With federal (including defense) dollars stretched thin, military logisticians and their private-sector contractors will be under the gun to show further efficiencies and cost cutting. This requires process, personnel, contracting and technology changes.

Military and government agencies and their contractors, in partnership, have implemented and are experimenting with a variety of techniques to achieve efficiency and value. These include adapting private sector practices to military supply chains, leveraging enterprise-level economies of scale, entering into innovative contracting relationships, taking steps to abbreviate the supply chain and implementing new information technologies. One thing is clear: With the coming defense budget cuts, it has never been more important to take steps to minimize supply chain costs and maximize supply chain value.

"Supply chain management is a strategic, cost-effective way of coordinating and integrating key business processes across the supply chain to ensure warfighters get what they need, when they need it," said Kimberly Gavaletz, vice president of enterprise logistics solutions at Lockheed Martin's Global Training and Logistics business unit. "It becomes even more important in times of greater budget austerity, providing commands with technologies that help warfighters anticipate issues and deliver transparency, while driving greater affordability and cost savings into sustainment efforts."

"There is going to be a lot of pressure to reduce discretionary funding," said Major General (Ret.) Charles Fletcher, former director of operations and plans at the U.S. Transportation Command and now a senior vice president at Alion Science & Technology. "In the past, budget reductions have impacted military readiness as repair stocks were slashed. The big challenge now is to articulate the connection between supply chain investments and the ability of our armed forces to perform in current and future conflicts."

Two of the key government agencies that work to streamline military supply chains are the Defense Logistics Agency (DLA) and the General Services Administration (GSA). "We work hard providing over 5 million national stock number items to warfighters," said Redding Hobby, deputy director of DLA Logistics Operations. "We recognize that we have got to become more efficient. We are continually revisiting our processes. We have an enterprise business system that allows us to measure almost everything we do, from acquisitions to supplies, so it is easy for us to look back and see what we did and how we did. Given the prospects of tighter budgets, it will be more important that ever to use continuous improvement processes to assure the readiness of the armed forces."

The GSA is part of the national supply system that distributes material to warfighters, noted Jeff Thurston, director of GSA's Office of Supply Operations. "Together with DLA, we manage and supply products that DoD orders," he said. GSA is generally tasked with supplying non-military specific commodities such as office supplies, tools, paints, adhesives and janitorial supplies. DoD is GSA's biggest customer and provides GSA with 80 percent of its business.

"In times of budget austerity, GSA presents a better value proposition than ever," said Thurston. "It is all about saving money for DoD by leveraging volume. The more we save for DoD, the less DoD has to spend on administration and support and the more it can allocate towards its national security missions."

GSA's value to DoD involves driving out costs by managing procurements and acquisitions at the enterprise level. GSA's multiple award schedules, contract vehicles available to customers across the federal government, one of which applies to logistics, aggregate demand for products at the federal government level.

"DoD often uses the vehicle for its distribution, transportation, logistics support and logistics services," said Jeff Koses, GSA's director of acquisition operations.

"What we often say to customers," added Thurston, "is that GSA takes the acquisitions burden and comparison shopping off the shoulders of agencies. We have already established the best value contracts so that you, as the customer, just have to order the desired product through our automated system." Essentially, GSA acts as akin to an outsourcing company for some supply functions so that DoD can focus on mission-critical activities.

More than ever, military and government agencies are working in partnership with the private sector to achieve supply chain efficiencies. "Partnering with DoD," said Gavaletz, "we incorporate elements of commercial models to build more dynamic and responsive supply chains, while tailoring solutions to the DoD's needs."

The notion of learning supply chain techniques from the private sector is not lost on DLA. The agency has flexibly adopted and adapted supply chain management techniques from the private sector to challenges that DLA faces. "We look to leverage best practices from the business world with flexibility and adaptability," said Hobby.

"Some of the supply chain tactics we use are also recognizable by our commercial partners as practices adopted from the private sector," said Ken Latta, GSA's deputy director of the Office of Supply Operations.

Some of the private-sector techniques that DLA has adapted to reduce costs are seemingly contradictory. For example, DLA has sought to drive down prices of commodities by holding reverse auctions, essentially one-off transactions for the supply of specific products, while in other cases the agency pursues long-term contracts such as performance based logistics (PBL) arrangements.

"We have held reverse auctions for items that are commercially available, are not unique to a platform or system, and where we know that several vendors supply the product," said Hobby. "Longer-term contracts give suppliers the assurance they will be there for the long haul so they invest in reliability, thereby reducing dependence on repair parts.

PBLs seek to get vendors to guarantee a certain level of performance."

Reliance on long-term contracts attack the lion's share of the costs of weapons systems, noted Randy Pilling, vice president for programs at AAI Logistics & Technical Services. "On average, close to 70 percent of costs occur in the sustainment phase of weapons systems," he said. "You can achieve significant reductions in life cycle costs by stressing accountability for performance with PBLs."

"Contractors may lose money in the first two years of a contract making investments," said Fletcher. "With longer-term contracts, vendors know they will be able to make that up in years three, four and five. One way to drive down costs is to look at total life cycle costs. Too often we look only at annual costs."

PBLs, specifically, are a way for military supply chains to leverage the expertise of their private-sector partners. PBLs are usually long-term logistics support contracts based on incentives to achieve specific performance goals.

Lockheed Martin has been operating performance-based supply chains since 2001. "Our Navy aircraft tires program with Michelin provides Navy-unique aircraft tires worldwide in two days for locations within the United States and four days for areas overseas, exceeding our 95 percent on-time delivery targets since going live," said Gavaletz.

As part of the PBL that supports the Shadow unmanned aerial vehicle, AAI has shouldered an enormous level of risk on behalf of the government, thereby providing significant value. "The government is looking for accountability with PBLs," said Pilling. "With the Shadow program, we are accountable for delays for processes, such as military transportation, over which we have no control. You don't see many companies signing up for that level of responsibility."

AAI is able to take on this risk because it has a great deal of historical data on the Shadow program and can accurately anticipate transportation and repair times, according to Pilling. "The demands sometimes stretch us," he said, "but that is a good thing. It makes us get better and motivates us to improve our systems."

There are a number of techniques to shorten supply chains, making them quicker and more responsive to warfighter needs. When the traditional supply route to Afghanistan through Pakistan became compromised last year, DoD planners established alternate routes through the north, from countries like Kazakhstan, Tajikistan and Russia.

"DoD requested that we join them wherever possible in buying supplies from those countries," said GSA's Latta. "The primary reason was to support those countries in exchange for their help. But secondarily it has slashed the distance and reduced the costs for delivery of certain supplies to the Afghanistan theater. We are achieving some good successes and are taking costs out of the supply chain for items like soaps, gloves, office supplies, paper towels and toilet paper."

Direct vendor delivery to the customer also foreshortens supply chains. "Lockheed Martin continues to add suppliers who can meet the requirements to ship directly to the military," said Gavaletz. "This reduces inventory carrying costs and expenses associated with warehousing and shipping."

Alion has innovated supply chain contraction with a program called the repair parts hospital, a forward fabrication capability for units far from the normal resupply network. The hospital is self-contained in an enclosure that can be trucked or airlifted to the site. "When certain items break they can be repaired on site," said Fletcher. "This has an impact on the supply chain."

GSA's strategic sourcing program is an attempt to gain an understanding of spending drivers in an effort to wring costs out of the system. "It is less about getting better unit pricing and more about understanding where practices may have driven costs up and then getting them out," said Koses.

GSA has concentrated its strategic sourcing efforts initially to office supplies. Two of the changes made have been to restrict the frequency of requests for overnight deliveries and to increase the minimum value of individual orders. "Both of these have decreased costs tremendously," said Koses. "Some agencies have seen savings of as much as 30 percent on office supplies." Overall the program saved $20 million during fiscal year 2011.

Implementation of information technologies promotes supply chain visibility, which allows commands to proactively address supply concerns and can help optimize supply chain assets. Lockheed Martin's Joint Asset Management Engineering Solution provides the United Kingdom's Ministry of Defence automated asset management, giving operators real-time maintenance status and operational availability of platforms, support equipment, test equipment and supply items.

Lockheed's Autonomic Logistics Information System (ALIS) integrates operations, maintenance, prognostics, supply items, customer support services, training and technical data for the F-35 aircraft. "ALIS will serve as the information infrastructure, transmitting aircraft health and maintenance action information to the appropriate users on a globally-distributed network to technicians worldwide," said Gavaletz. "The system allows users to pre-position parts and qualified maintainers on the ground, so that when the aircraft lands, downtime is minimized and efficiency is increased. Additionally, we've pioneered condition-based and predictive maintenance solutions that help commands predict and plan maintenance schedules."

GSA's DoD Express initiative allows users to order items through a global system and for GSA to fulfill those orders from inventory closest to where delivery is to be made. "We studied how our DoD customer has positioned itself with its forward operating bases," said Latta. "Using software, we designed staging groupings and shipping lanes to speed up the supply chain and reduce the number of shipments. As a result we were able to cut customer wait time and logistics response time from 45 days to one."

The continued partnership between industry and government is essential to keep up the momentum of supply chain improvements. "Government and industry succeed in reducing supply chain costs when they work together in a productive partnership," said Gavaletz. "Collectively, the team must think creatively about how to develop solutions, while accommodating budget and mission requirements."

"Industry is central to wringing costs out of the system," added Koses. "We have made an effort to improve communications with industry on how we can do business less expensively so that we can pass those savings on to DoD. With the planned defense cuts coming in 2013, we are having some good conversations about strategic sourcing that can reduce costs and leave DoD more for its missions."

"We have a perfect opportunity right now to increase public-private partnerships," said DLA's Hobby. "With the military budget targeted and already scheduled for reduction, building relationships with industry partners can be a win-win situation. The opportunity for investments to help maintain and improve military supply chains has never been better." ★

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Subsistence Systems

As part of market research designed to identify systems available in the commercial market that can be used for food service to support emergency response operations, the U.S. Army Natick Soldier RD&E Center, National Protection Center, is looking for information on subsistence systems. Subsistence systems will be limited to mobile kitchens serving groups of 20 or more with full-service food storage, preparation and cooking capabilities.

The Department of Homeland Security' Science and Technology Directorate will also be participating in the review of the findings of the research. DHS established the System Assessment and Validation for Emergency Responders program to conduct comparative assessments and validation activities that provide the emergency responder community with information on important products and services.

FA-XX

NAVAIR's Warfare Analysis and Integration Department is conducting trade space refinement as a precursor to an analysis of alternatives for candidate strike fighter aircraft replacements for the FA-18E/F and EA-18G. The intent of this research is to solicit industry inputs on candidate solutions in the 2030 timeframe for CVN-based aircraft to provide air supremacy with a multi-role strike capability in an anti-access/area denied operational environment.

The notional aircraft will be capable of operating from CVN 68 and CVN 78 class aircraft carriers, as part of the carrier air wing, with minimal impact on the ship configuration and the operations of the rest of the CVW.

In looking through the market research information, most of the key focus areas deal more with the operational characteristics of the platform. Information pertaining to the rough order of magnitude cost estimates for development cost, flyaway cost, procurement cost, acquisition cost and operating cost is requested. The concepts matrix also included several data points relating to maintainability.

Where Will They Go?

The Air Force has filed a draft environmental impact statement for the proposed operational basing of the F-35 Lightning II within the continental United States.

The current active Air Force and Air National Guard alternatives under consideration are: Burlington Air Guard Station, Vt.; Hill Air Force Base, Utah; Jacksonville Air Guard Station, Fla.; Mountain Home AFB, Idaho; and Shaw AFB/McEntire Joint National Guard Base, S.C.

"Candidate installations were identified through a deliberate process that began with a clear definition of training requirements and progressed through a screening process leading to the alternatives currently being considered," said Kathleen Ferguson, the deputy assistant secretary of the Air Force for Installations. "The Air Force is analyzing the impacts of basing three squadrons of 24 aircraft each at the active duty location and one squadron of 24 aircraft at the Air National Guard location."

Hill AFB is the Air Force's preferred alternative for the active duty operational location and Burlington Airport is the Air Force's preferred alternative for the Air National Guard operational location. A final decision regarding selection of an operational bed down location will be made upon completion of the environmental impact statement.

By Mitch Gettle, Air Force Public Affairs Agency

Compiled by KMI Media Group staff

Theater Sealift Support

The U.S. Navy has awarded CSC a task order to provide program management support to the Strategic and Theater Sealift Program Office.

"The acquisition programs CSC will support on this contract are vital in executing the Navy's 21st-century war fighting plans," said Alan B. Weakley, president of CSC's North American Public Sector Defense Group. "The 'Sea Base' strategy allows U.S. naval forces to operate at-will throughout the world without relying on the support of other nations in the execution of our foreign policy."

Under the terms of the agreement, CSC will provide a full range of program management support including acquisition document preparation, financial management, test and evaluation, integrated logistics, systems integration and technical/engineering.

The Strategic and Theater Sealift Program Office is responsible for executing the Joint High Speed Vessel and Mobile Landing Platform acquisition programs as well as the Sealift Research and Development initiative, which includes operational logistics.

Humanoid Robotics

Boston Dynamics Inc. (BDI), Waltham, Mass., is positioned to receive a sole source contract from the Defense Advanced Research Projects Agency, Tactical Technology Office (TTO), to develop and build a set of humanoid robot systems for use by performers in both phases of the DARPA Robotics Challenge program. This effort will develop approximately eight identical platforms consisting of two legs, a torso, on-board computing, two arms with hands and a sensor head. BDI will deliver these robots to DARPA so they can be provided to the top software development teams based on the results of the Virtual Disaster Challenge. Boston Dynamics will also provide in the field support and as required maintenance to the delivered systems.

The U.S. Army under its Protection Ensemble Test Mannequin program developed, with Boston Dynamics, a humanoid robot with advanced range of motion and strength. This effort was then the basis of work done by BDI under the DARPA DSO M3 program on a platform named Atlas to increase its mobility. These two efforts have combined to develop a one-of-a-kind humanoid robot with state of the art capability. DARPA has been a lead researcher in ground robotics over the last few decades. In addition it has tracked developments in this area outside the agency. Of the few existing humanoid robots, BDI was deemed to be the sole viable supplier for providing the necessary robotic platform capability within the specified timeframe.

Crew Positioning for Savings

It's been said that "flexibility is the key to airpower." It's because of that flexibility that Air Mobility Command officials are saving money by the millions and fuel in hundreds of thousands of gallons by positioning crews for C-5 Galaxy missions where they are needed without the expense of a permanent move.

Program managers at the 618th Air and Operations Center and AMC have found a way to avoid costs and increase efficiency by positioning crews for C-5 flights where they are needed through the Mobility Mission Linking (MML) program. MML is a tool permitting AMC to exercise flexibility in the face of shifting strategic airlift requirements.

MML can be executed by an informal agreement between the 618th AOC (Tanker Airlift Control Center) and multiple wings on an as-needed basis and then adjusted or turned off as requirements dictate. Also, aircraft locations often require geographically-separated units to travel to and from the central or eastern United States empty prior to initial on-load and following final off-load. In all, MML helps streamline C-5 air operations.

"The basis for the program is to shift resources to where the need is without the cost and burden of a permanent move," said Major Joshua Doty, strategic allocations director with the 618th AOC.

In just three short months, the MML program has produced positive returns.

According to Doty, between December 4, 2011, and February 29, 2012, nine positioning sorties were completely avoided and four positioning sorties were reduced using the MML program. Also during this time period, 11 depositioning sorties were avoided while two depositioning sorties were reduced. AMC was able to save more than 349,000 gallons of fuel and 129 flying hours for a total cost avoidance of $1.3 million.

By Master Sergeant Sabrina D. Foster, Air Mobility Command Public Affairs

Q&A

Army Logistics to Prevent, Shape and Win

Lieutenant General Raymond V. Mason
U.S. Army
Deputy Chief of Staff, G-4

Lieutenant General Raymond V. Mason assumed duties as the Deputy Chief of Staff, G-4 on November 3, 2011. He oversees the policies and procedures used by a quarter million U.S. Army logisticians throughout the world. He served as the Assistant Deputy Chief of Staff, G-4 (Operations) from July-November 2011.

Before joining the Army staff, Mason served as the G-4, United States Army Forces Command (FORSCOM) from August 2009-June 2011. He directed logistics support to the Army's largest command and was responsible for the readiness of more than 80 percent of the Army's operational forces. He oversaw the sustainment, equipping, training, mobilizing and deployment of forces to the COCOMs and worldwide contingencies.

Mason's other key command and staff assignments include: CG, 8th Theater Sustainment Command, Fort Shafter, Hawaii; CG, 19th Support Command (Expeditionary), Daegu, Republic of Korea; CG, Defense Supply Center Philadelphia, Defense Logistics Agency; CG, Army Materiel Command (Theater) Southwest Asia, and C-4, Operational Sustainment, Coalition Forces Land Component Command, Central Command, providing logistics support to U.S. forces operating in Iraq, Afghanistan, Kuwait, Djibouti, and across the ARCENT area of responsibility.

Mason served as the commander, 25th Infantry Division, Division Support Command; commander, 407th Forward Support Battalion, 82nd Airborne Division; commander, E Co (Rigger), 407th Service and Support Battalion, 82d Airborne Division; and commander, Services Company, 21 Supply Battalion (Australian Army Exchange), Sydney, Australia.

Mason completed his undergraduate studies at James Madison University as a Distinguished Military Graduate with a Bachelor of Arts degree in business marketing and management and was commissioned a Second Lieutenant in the Quartermaster Corps in December 1978. He is a graduate of the Quartermaster Officer Basic and Advanced Courses, the Command and General Staff College and the Industrial College of the Armed Forces. He received a Master of Science degree in procurement/contract management from Florida Institute of Technology and a Master of Science degree in national resource strategy from the National Defense University.

Mason's awards and decorations include the Army Distinguished Service Medal (1 Oak Leaf Cluster), Defense Superior Service Medal (1 Oak Leaf Cluster), Legion of Merit (2 Oak Leaf Clusters), Bronze Star Medal, Meritorious Service Medal (5 Oak Leaf Clusters), Army Commendation Medal (3 Oak Leaf Clusters), Army Achievement Medal (1 Oak Leaf Cluster), Master Parachutist Badge, Parachutist Rigger Badge, Australian Jump Wings, Joint Chiefs of Staff Identification Badge and the Army Staff Identification Badge.

Q: Soon after hitting the G-4 floor, you began holding "See Yous." What is your intent with these and what have you learned from these meetings?

A: I actually took this from Major General Wright, a great Army logistician, who has since passed away. We called him the "chicken man." When he was serving in the Army G-4 and I was a young major, he did "See Yous." In the Army, we have these things called "See Mes," where you tell an action officer to come to your office. So he came up with this thing called a "See You," which means that he or I would go to their office location—so you get out of your office, you go visit the action officer in their battlespace.

I did that my last couple of jobs and found it very helpful. It's built around the "leadership by walking around" concept. I go into the office space of the particular section that I'm going to see. I give them an hour and a half to two hours, leaving the agenda up to them. It's their chance to spend focused time with the G-4 and talk about whatever they're interested in, whatever they think I need to know.

By doing it this way, I get to see things I wouldn't have seen otherwise in a normal daily battle rhythm. I also get to sit down with action officers who are more junior, buried deeper in the G-4, in a one-on-one conversation. I just find it healthy and informative; it gets the juices flowing within the organization.

Q: You also called for an azimuth check [AKA off-site]—especially as it related to the Army's primary focus areas. Was this check a physical event, in that meetings were held and reports drawn up, or was it meant more as a self-evaluation by your directors and teams to ensure that everything being done had a purpose and intent?

A: It's really a combination. All of our director heads, division chiefs and branch chiefs did some preliminary work with the G-4 initiatives group for a couple of months leading up to it. When I came in and took over from Lieutenant General Stevenson in November, we already had a solid vision, mission statement, and way ahead. We had pretty good azimuths we were on, but I wanted to get a feel—do a dipstick—where we were and need to go.

I laid out some basic business process rules about what I wanted to do, and after the preliminary work was done we physically headed off-site for a day. We went through our mission statement, our vision, the focus items and a near-mid-term perspective with a little bit of future. When I say 'near-mid-term,' near is in the next three to six months, mid is the next year to two years. We spent some time on the near and mid-term, not so much beyond that, but we're going to do that soon.

I really built it around Chief of Staff General Odierno's vision for the Army: Prevent, Shape and Win. We also took the Secretary of the Army's focus items, the new national military item strategy, and the Army Campaign Plan and we used those as our foundation. We asked: How can we help them meet their objectives? Shortly thereafter I published what I believed should be the G-4 focus areas. This summer, we will do a deeper, broader review that will focus on lines of effort underpinning the main work of the Army Campaign Plan.

Q: The budget request is out and the numbers were as expected. What challenges do the numbers represent for Army logistics and how will you harness those into opportunities?

A: Well, we went through the budget challenges this year and worked our way through the reductions the Department of Defense took, and we've been able to work inside those reductions. We are taking some risks in the out years that we think we'll be able to re-evaluate as things become clearer specifically for structure. We're also able to mitigate near-term risks with OCO funding, and we're confident that Congress and the nation will continue to support us for the war fight.

Since we've had great support from Congress and the American people, we've been able to infuse a lot of readiness into our equipment—the tactical wheeled vehicle fleet and the tracked fleet are both in very good shape from a readiness and age standpoint.

There is some risk in the out years, particularly in depot maintenance and perhaps some in our transportation funding, so we are going to rework those numbers in the next POM [program objective memorandum]. As the Army's planned force structure firms up, we will be able to make more informed decisions in terms of that budget work.

The other piece we are working on is divesture of old equipment. Because we've infused a lot of new equipment into the Army the last 10 years, we're able to shed ourselves of older systems that continue to consume O&M dollars—and as we divest that will save us dollars in the out years. We've put messages out about what to divest and by incorporating the work that TRADOC's doing in the Army 2020 doctrinal work, we'll be able to adjust our investment in the out years.

Q: What are the next major milestones for GCSS—both for the Army and in the joint environment?

A: The GCSS-Army—Global Combat Support System-Army—is an Enterprise Resource Planning System, an ERP, and it's in the top three of my focus items. Number one is support the current fight, number two is Property Accountability, and 2A would be fielding GCSS-Army.

The wholesale side of it, the Logistics Modernization Program, has been fielded by AMC. Now we're focusing on the retail level, which is called GCSS-Army. It'll fold all the standard automated systems we have in logistics—supply, maintenance, transportation, property accountability—into one system, one database. We're going to take about 40,000 disparate databases and fold those into a common language. It'll be used by 160,000 people, meaning every company-sized unit in the Army will be touched by this.

This is a huge investment—$4 billion over the POM—and we'll begin to field it this fall. We've been doing initial testing at the National Training Center with the 11th Armored Cavalry Regiment. We completed our Initial Operational Testing and Evaluation a few months back at Fort Bliss with the Brigade Modernization Command.

The challenge is that ERPs are really hard. I was involved in an ERP at the Defense Logistics Agency when they fielded the Business Systems Modernization ERP. To be successful, there are two key things we have to do. Number one is we have to be meticulous and really have our hands on the project management side. We have a great team working that. Colonel Pat Flanders and Lieutenant Colonel Tim Domke are both magnificent project managers so I'm very comfortable with that.

Secondly—and perhaps in some ways, more importantly—we have to stay closely linked to the customer, to the user, the person who is actually going to sit behind the screen and start keystroking in under GCSS-Army. We have an entire program focusing in on those folks and informing them about what's coming. We are also going to be very aggressive in our help desk, particularly early on, making sure that we are immediately addressing any concerns out there.

At the start of fiscal year 2013, we'll begin Wave One, which is the supply warehouses. Then the next few years we'll be getting the property book and maintenance modules fielded, so it's a phased approach, and I'm encouraged about it. As I said, ERPs are hard so it's going to take a lot of constant watching, which we are doing.

Q: What do you consider the Army's most significant operational energy initiatives?

A: Let me give a little background first. When I arrived here in November, we were just at the beginning of assigning operational energy responsibility within the Army staff to the G-4. That process is almost complete, all we have left to do is get the last document signed to make it official. As far as the Secretary and the Chief are concerned, I have operational energy here in the G-4.

My great partners are ASA, IE&E, Ms. Katherine Hammack and her deputy Mr. Richard Kidd, and Colonel Tim Hill. These people have already been doing a lot of work on OE for the past couple of years.

Operational energy had already been living in G-4 to a certain extent, in our Logistics Innovation Agency led by Dr. Vic Ramdass, but I decided I needed to stand up an office inside of G-4 using current resources. I've got Colonel Paul Roege in charge of that with a great support team. This office allows the G-4 to really focus and synchronize our efforts.

We also have great partners at the Secretary of Defense level with Ms. Sharon Burke. Her office is focused on this issue full time. There is also the partnership and relationship with ASA(ALT) Ms. Heidi Shyu as well as Lieutenant General Bill Phillips. The partnership also includes AMC, TRADOC, CASCOM, the Army Corps of Engineers and many others—truly a team of teams.

We're investing in a number of different places to be better stewards of energy. Some are more near term with soldier-related pieces of equipment for lightening the load on soldiers, managing power at the soldier-level, reducing the weight side, and increasing the power of batteries; soldiers carry a significant amount of batteries. Ms. Shyu's research and development team has committed a significant effort and funding to these initiatives.

In the traditional equipping side, we just started fielding our new generator, which is 25 percent more fuel-efficient than our current model. It's called AMMPS [Advanced Mobile Medium Power Source]. We've got the whole family from 5Ks on up. That will consume dramatically less energy on the battlefield.

Let me back up a little bit. Right now, on the OEF battlefield, about 80 percent of the convoys that are moving any particular day around the battlespace are carrying fuel. That's a huge funding and resource requirement—and unfortunately an opportunity for the enemy—so anything we can do to reduce that consumption is important. Money is certainly something that we're concerned about, but this is really about reducing the footprint and the burden on the commanders.

The anecdotal story I use is if you're a FOB [forward operating base] commander in Afghanistan and every day 40 fuel trucks show up at the front gate of your FOB, that's 40 opportunities for the bad guys to get inside your forward operating base with a bomb. Keep in mind as well that you've got to figure out how to get that convoy to your location, meaning that soldiers are exposed to the enemy along those routes; you must store that fuel somewhere on your FOB, which takes up more space, you need to build a bigger FOB, you need more security … so it's the second and third order effect of fuel on the battlefield. In fact, most of that fuel is being consumed by generators. It's producing local power, basically for human consumption in terms of living and working space there.

Developing more fuel-efficient generators is part of it, but so is building micro and mini generation grids so power can be distributed more effectively. These grids allow you to meter and measure usage to understand where and when power is being consumed and adjust usage based on needs. For example, do living quarters need to be air conditioned at the same level when occupied and not? You can do that with a micro grid, but not nearly as easily with individual generators. We are also looking at things like insulated working/sleeping shelters so we aren't air conditioning the desert.

In the aviation area, we are developing a new engine that is 30 percent more efficient, which is huge. We're also looking at reducing fuel consumption of the M1 tank. We'll do that through our reset program. Another vehicle program is the JLTV. We are working energy savings there, but it's a constant tradeoff between survivability, mobility, lethality, efficiency and fuel.

The last thing I'll mention is that we've got a number of places, Fort Devens and Fort Leonard Wood for example, where we're testing capabilities of energy-efficient technologies such as solar panels, water recycling and micro grids. We want to start writing these types of energy saving technologies into our LOGCAP contract [Logistics Civil Augmentation Program] that the Army Sustainment Command runs for the Army. We'll put requirements in our contract language and specifications that'll require our contractors to reduce the consumption of fuel. We'll know it's possible because we will have proven it at Fort Devens and Fort Leonard Wood.

Q: Going green can be expensive in the short term. How can the Army and the other services manage the upfront expenses of many green initiatives during tight budget times?

A: You have to be able to show that current investments will pay off in the future—and frankly we've got a ways to go there. I'm not comfortable that we have the models that can really describe the best way to go green upfront.

An example of a good news story is that we recently briefed our Operational Energy Initiatives Capabilities Document to the Joint Capabilities Integration Development System, and we received a go to continue to move it. This speaks volumes about our investments for the future.

In alternate fuels on the battlefield, we're looking at some possibilities there. We're certainly already doing it in our non-tactical fleet. Particularly back here at home station, Ms. Hammack is working very diligently, and so is Lieutenant General Michael Ferriter, our IMCOM [Installation Management Command] commander, to reduce energy consumption in our fixed facilities.

We're trying to figure out how can we take some of those lessons learned for going green at our fixed, non-combat bases and apply them to a contingency base. We've had bases in Afghanistan for eight to 10 years. Why not take some of the lessons learned and put them to use there, recognizing that it's a different environment. You don't want there to be more burdens to the commander, but where can we make the commander more effective and efficient?

Q: The Army owns a lot of stuff. What are the challenges of keeping track of it all, ensuring it is where it is supposed to be and that there is accurate property accountability?

A: The good news is we've done a very credible job of maintaining property accountability. But it's not good enough. And we're not there on auditability yet either. That's one of the key features of GCSS-Army—it will allow us to accurately track the dollars and assets.

We've had a property accountability campaign for several years—General Casey kicked it off when he was the CSA. The G-4 publishes a monthly newsletter to keep people posted. During my travels around the Army, I am always talking about property accountability. Each one of the major commands has a command supply discipline program. We write the policy in G-4 and assist the commands on managing it, but it's really a commander's program.

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A challenging infrastructure creates difficult challenges for road movement in Afghanistan, clearly illustrated here by the one-lane tunnel at Salang Pass. [Photo courtesy of DoD]

We just completed a property accountability task force review that was led by Major General Tim McHale. He did a magnificent job. Over three months, they assessed where the Army stood on property accountability. They came up with a number of findings and gaps. We briefed the Vice Chief of Staff of the Army and will brief the entire Army leadership to lay out our action plan and assign responsibilities. Of those gaps, the G-4 probably owns about half of them, so we've already begun to work our way through those.

What are some of the conditions that created some of these property accountability challenges? Well, we have a lot of equipment spinning in different piles. We have left behind equipment, there is pre-deployment training equipment, we've received new equipment fieldings, and we have non-standard equipment—all with the goal of making us more combat effective.

AMC was recently designated as the Lead Materiel Integrator, which moved some of the operational equipping functions out of the Pentagon and into AMC. This will help a lot with visibility as well. AMC and Army Sustainment Command are working their way through an equipping decision support tool that will help significantly with our property accountability.

Frankly, the reality is we've run a rental car company for the past eight years, where units didn't necessarily own equipment, they just borrowed it. This created some unintended consequences with responsibility and accountability.

We need to get away from that and the way to do that is with processes. To that end, I'm really focused on how to do things better, including improved training and more partnering. We can also make use of other sets of eyes—the Army Auditing Agency, OSD-IG and even GAO to constantly look at how we can improve property accountability processes.

As I said, my top three priorities are to support the current war fight, continue to focus on property accountability, and GCSS-Army. In many ways, those three are related, as we support the war fight appropriately and use GCSS-Army to maintain property accountability focus.

Q: Does the Army have a responsibility to the industrial base to sustain key and perishable skills and product lines to ensure future capabilities?

A: Yes, absolutely. I'll divide it into two pieces. We have the organic industrial base, and we have the commercial industrial base. What both have done over the last 10 years is really almost a miracle, rivaling what we did in World War II.

The organic industrial base—with our five maintenance depots—has really ramped up. They reached a peak in probably about 2009-2010, in terms of work at the organic industrial base. We did that through our magnificent full-time workforce. To supplement that we brought on temps and term hires, and we also brought on civilian contractors at our maintenance depots. Now the reality is, demand is going down, the war fight is going down, so we're going to be working on sizing the organic industrial base appropriately to demand.

The organic industrial base operated exactly as we wanted it to. It was critical that we had it, along with our manufacturing capabilities at our arsenals at Watervliet, Rock Island and Pine Bluff. This allowed us to expand for wartime demand, and we will bring it back down as appropriate. By ensuring we maintain a core level of work, we then retain expandability capability if something else happens in the world. These are key capabilities in both the maintenance and industrial base as well as our manufacturing arsenals.

On the commercial side, we could not provide the support from an industrial perspective just in-house; we really do need our super commercial partners. We need their innovation, we need them pushing the envelope. We need to stay very close with them and we are doing that.

OSD is leading a tier-by-tier, sector-by-sector review of the commercial industrial base. That's going to be very informative and will let us know where we have gaps and where we might need to fill them in with our organic industrial base. Our partnerships and government-owned, contractor-operated facilities are important, and in the last couple of years we've really been leveraging public-private partnerships.

One example is with Stryker right now at Anniston. This highlights our ability to partner with each other and take the best of both, the organic and commercial expertise.

As the G-4 of the Army, I manage the budget for the organic industrial base. They have performed miracles in the last 10 years. We just have to make sure that we draw the base down in a smart and methodical process and that we're able to ramp it back up as necessary. The support that Congress has given us again has just been magnificent.

Q: Any closing thoughts on the men, women and mission of Army logistics in 2012?

A: In closing, let me just talk about logistics in general and more specifically about our Army. What the LOG nation has done over the past 10 years is nothing short of absolutely brilliant. The American Army and the other services are the best-fed, best-equipped, best-maintained military in probably the history of the world. Yes, you can always find spot shortages and spot challenges, but at the tactical, operational and strategic level, really no one's gone wanting for anything.

That's a community effort, again with the ASA(ALT) community, with the ASA I&E, certainly AMC and our great commercial partners, TRANSCOM, and I would add our DLA partners, they've been huge. What DLA has been able to do on the battlefield with food, clothing textiles, repair parts, fuel, etc., they have really hit a home run.

From an equipping standpoint, we are out of Iraq. There's some equipment that the Department of State has and the Office of Security Cooperation Iraq has, but the thousands and thousands of vehicles, the thousands and thousands of containers are out. They're pretty much gone from Kuwait, and we've shipped it back here to the industrial base for reset. To me, that is truly as impressive an accomplishment as the Red Ball Express of World War II, if not bigger. I'm just absolutely humbled to be part of the logistics community.

We have a tough mission ahead of us in Afghanistan to support the current fight in a landlocked country and all the dynamics that are there. It will be an order probably five to 10 times harder to get the equipment out of Afghanistan than it was out of Iraq and Kuwait. People know what the challenges are there, and we have a solid plan.

Our Army—and the other services, Marines, Navy, Air Force, Coast Guard—have been at war for 10 years. This is an all-volunteer force; we went to an all-volunteer force in the '70s and many people predicted that if we ever got into protracted conflict we'd have to go back to the draft. Well, this is the longest war in American history, and we have not had to go back to the draft, which I think speaks volumes about the citizens of our nation—the men and women who raise their right hands to serve something greater than themselves.

Most of them have joined our ranks since 9/11, knowing full well that they may have to go into combat and give the last full measure. Yet they've done it. To me, they come from the same DNA, cut from the same cloth, as the Americans that preceded them at Valley Forge, Gettysburg, in the Somme in World War 1, on the beaches of Normandy, Korea, and the Ia Drang valley of Vietnam.

Troops are unloading a house-in-a-container at a forward operating base. [Photo courtesy of U.S. Army, by Sgt. Breanne Pye, Public Affairs Office, 1BCT, 4th Inf. Div.]

They're the next greatest generation. What we are going to have to do is invest in the future of our military, but also in these young men and women, because the wounds of this war—traumatic brain injury and post-traumatic stress—are many times not visible.

Our nation must continue to invest and make sure we do the right thing and take care of these men and women in the years to come. I know the Department of Veterans Affairs, and certainly all the leadership of the Department of Defense, and our political leadership in the White House and Congress are also very focused on this care for our wounded warriors.

So my closing message is our Army, and all the services, have achieved great logistics success in the past 10 years. We must leverage and learn from the past, continue to innovate, and get even more effective and efficient, because the future will likely be even more challenging than the past. However, I know the LOG Nation is absolutely up to the task. ★

Smarter Cargo Drops

Sometimes the safest and most efficient way to resupply forward locations is from the air.

By Henry Canaday, MLF Correspondent

Air drops play an increasing role in support of U.S. ground forces, especially in the rough and remote terrain of Afghanistan. The Army and Marines continue looking for new air-drop technologies that are safer for troops, more accurate, less expensive and more capable.

All kinds of materials are dropped by parachutes from many platforms, with heavy drops done from a C-17 Globemaster III or C-130 Hercules and lighter weights from smaller aircraft and helicopters, noted Scott Martin, equipment specialist with the Airdrop Technology Team at U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC).

About 85 million pounds were dropped in Afghanistan in 2011, the vast majority in container drop systems (CDSs), summarized Major Robert Jarzyna, an assistant product manager with NSRDEC. A CDS carries up to one ton. Parachutes delivered 2 million pounds in 2005, a volume that nearly doubled in each succeeding year. By fall 2011, air drops supplied 27,000 troops at 43 forward operating bases (FOBs).

Air drops avoid the dangers of land convoys or re-supply by helicopter delivery. Most drops are from low altitudes. The Air Force is not worried about ground threats and is comfortable with low-altitude drops. NSRDEC calculates that re-supply by parachute has saved hundreds of lives. It can even save money, compared with land convoy, in many conditions.

Unguided parachute systems use known wind conditions to hit a location. These are usually low-velocity parachutes dropped from 3,000 feet or less. They are expendable, throw-away parachutes, or low cost aerial delivery systems (LCADS).

LCADS high-velocity parachutes hit the ground hard and minimize drift. They are used for altitudes above 3,000 feet. NSRDEC reports low-velocity chutes are used 72 percent of the time, high-velocity chutes about 17 percent.

Another LCADS approach, low-cost, low altitude, is used for drops of a 100 pounds or less from small fixed wing aircraft like the CASA C-212 Aviocar or de Havilland Canada DHC-4 Caribou, both often flown by contractors. Taking only 4 to

6 seconds to hit the ground, these systems are very accurate without real-time data on winds.

For larger loads, C-130s can carry up to 16 bundles and C-17s up to 40, so drop zones tend to be lengthy, at least 1,500 yards. In contrast, low-cost low-altitude systems can put cargo within an FOB perimeter.

These are programs of record. NSRDEC is now working on improvements and new air-drop systems.

Users want improvement in the low-velocity chutes that drop three-quarters of cargo, noted Mechanical Engineer Ryan Buckley. NSRDEC is developing systems that are 40 percent smaller and 35 percent lighter, saving 60 pounds of parachute weight. "That helps when you are doing hundreds of drops per day, there are cost savings and manpower savings." Buckley expects to this improvement to be ready by the end of 2012.

NSRDEC is also developing the joint precision airdrop system (JPADS), a family of guided autonomous systems to drop weights of 250 pounds all the way up to 60,000 pounds from altitudes up to 24,500 feet with accuracy better than 50 meters from any transport aircraft. Recently fielded JPADS include the 2,000-pound JPADS, the low-cost high-velocity JPADS, the low-cost, low-velocity JPADS and the low-cost, low-altitude JPADS. The 10,000-pound JPADS is close to being usable in theater.

NSRDEC has many other technologies under development or in science and technology phases.

The 5-10K high altitude-low opening (HALO) improved container delivery system (ICDS) is a family of gravity-dropped 5,000- to 10,000-pound HALO systems using a wireless activation device timer system to trigger openings near impact and allow for rapid velocity through most of descent to improve accuracy. This is close to being usable in theater.

The 2K G-12 and 2K LV-LCADS HALO ICDS is a scaled version of the above for 700- to 2,200-pound payloads delivered via HALO. Testing continues through the fourth quarter of fiscal year 2012. It too is close to being usable in theater, as is the Wireless Gate Release System, a device used by loadmasters to control time separation between CDS drops and allow tighter coupling of many drops from high altitudes.

Projects being shelved with no current requirements include the 30K Army technology objective, a 15,000- to 42,000-pound guided parafoil that has demonstrated scalable design for dropping payloads from 25,000 feet. Also shelved is the ballistic precision aerial delivery system, a 15,000- to 42,000-pound HALO system that converts a standard low velocity airdrop system to a high-altitude HALO system.

NSRDEC's air drop team is interested in fixed wing unmanned aerial system (UAS) airdrops and in unmanned rotary wing air-drops, such as the K-Max now being tested by the Marine Corps. The air drop team itself has not done much with unmanned drops. "That is still in the science and technology stage," Martin noted.

Other new concepts are being examined.

The high speed container delivery system (HSCDS) low and fast airdrop focuses on extracting up to eight CDSs from C-130Js and C-17s at 250 feet above ground with a landing accuracy of 50 meters.

The manned rotary wing airdrop concept could support multiple 2,200-pound or many smaller payloads, controlled by wireless activation and with parachutes that could be either dumb or guided.

Precision airdrop improvements for JPADS is a next-generation JPADS that includes obstacle avoidance, improved survivability, system-to-system communications and in-flight de-confliction.

Another new concept, humanitarian airdrop over populated areas, is being developed to deliver food and water directly to populations in need. Using small food and water items, injury risks would be minimized. The aerial delivery system would use a 15-foot ring-slot parachute to control descent until items are dispersed at a specified altitude. Residuals would use a flexible bag and foam cushioning for further injury prevention.

Private firms manufacture parachutes and systems and often help develop future technologies.

HDT Airborne Systems has been making parachutes for 90 years and is the largest supplier to the U.S. Army, said Chief Technology Officer J.C. Berland. The company puts strong emphasis on research and innovation.

Its latest work in cargo parachutes has been on JPADS, for which it has developed or is developing systems to drop 100 to 42,000 pounds. The 42,000-pound version would have a wingspan larger than a Boeing 747.

HDT has delivered 2,000 1-ton JPADS parachutes to the Army and these are used in Afghanistan. A 10,000-pound JPADS has been fully tested. Berland expects to start full production in July 2012. HDT's next big innovation is developing a throwaway version of JPADS chutes. Berland said recovery of JPADS can be dangerous and their return to launch bases increases logistical burdens. "Once you have gotten the beans and bullets, you have to return the system to depot by truck or helicopter."

So HDT aims for a one-shot JPADS with the same performance. The parachute would be cheap and easily degradable, power components would fry themselves out, preventing reuse for improvised explosive devices (IEDs), and structural parts would be organic and melt away.

"Our aim is to drive costs down and performance up," Berland summarized. "Why use dumb drop when you can use smart drop?"

The military has used parachutes to drop supplies for many years, noted Larry Williams, CEO of BRS Aerospace. "The standard parachute was round, made of nylon and meant to be recoverable and reusable."

But in Afghanistan, with hostile forces surrounding bases, the recoverable concept did not work as well. "So they developed the low-cost, one-time throwaway parachute."

These came in two types. Low-velocity chutes were used for softer landings of medical suppliers, electrical equipment and other gear that could be easily damaged. "High-velocity is used for beans, bullets and bandages that cannot be hurt," Williams explained.

The military also developed more expensive JPADS parachutes, with GPS and computers, that can be dropped safely at high altitudes. The electronic components are supposed to be reusable. "But they have the same problem; they have to get out there to recover the GPS and computer," Williams noted. BRS makes all types, low- and high-velocity throwaway, precision-guided, and parachutes for slowdown of aircraft, termination of UAS flights, flare and torpedo drops. The firm is one of the top three parachute makers in the military market.

Williams said the military now wants to reduce costs, increase weight and expand operational envelopes. "You will see an increase in size." Parachutes now drop up to a metric ton. Eventually, Williams predicts parachutes might be able to drop a tank out of the back of an aircraft.

One-time parachutes are made of cheap, common materials and Williams predicts there will be improvements in materials to reduce cost and increase the weight they carry. "On precision-guided parachutes there will be collision avoidance. They will talk to each other, so when you drop they will not hit each other. And they can avoid ground obstacles like hills, antennas and water towers."

Mills Manufacturing makes standard G-11 and G-12 cargo parachutes, according to CEO John Oswald. "We are also looking at making the new low-cost chutes being developed by Natick," Oswald said.

The firm does not design or develop chutes, only manufacture them from others' drawings. "This is our core competency; we have been doing it since World War II," Oswald said. The firm is one of the top four parachute manufacturers.

Lockheed Martin Aviation Systems partnered with Kaman Aerospace in March 2007 to turn the K-Max manned helicopter into an unmanned cargo hauler. The U.S. Marines deployed two K-Max unmanned helicopters in October 2011. By March 2012, the aircraft totaled 237 sorties, delivered more than 600,000 pounds of cargo, reported 94-percent mission capability with no accidents and needed only 1.1 maintenance hour per flight hour.

"We saw a need in mountain terrain and places with limited infrastructure," explained Jim Naylor, Lockheed director of business development for aviation systems. "Due to IEDs, there was a need to avoid convoys and do it by air without danger to pilots."

The K-Max is a helicopter with up to 6,000 pounds of lift, 4,300 pounds at 15,000 feet, "the right aircraft designed to do repetitive lift, all day, everyday," Naylor said. "It's the first unmanned helicopter to do logistics." There are 18 K1200s, the commercial version of K-Max, operating and one other military K-Max used for testing.

Demonstrated in January 2011, with an assessment in August 2011, the new aircraft was delivered within 75 days of deployment decision and flew its first mission December 17, 2011. It now flies from a main operating base to two FOBs.

K-Max can be flown entirely autonomously with GPS, but Marines usually control it. Autonomously, K-Max hits its destination within a few feet. Controlled flight puts it right on the spot.

The Army is watching the program with interest. Marines are operating K-Max in a military validity assessment now and Naylor sees interest in more acquisition.

K-Max can carry more systems if needed—for example to avoid or protect against fire, which it now does by flying at night very quietly. "We can add more systems," Naylor said. "So far they have wanted a truck, without a lot of extras."

K-Max has demonstrated the ability to drop both unguided and guided cargo parachutes, noted Terry Fogarty, general manager for Lockheed UAS production. He said collaboration with the Marines on K-Max, with private investment up front, constant communication and real-time decision-making, is a model for future military programs.

"Navy and Marine Corps Cargo UAS service will augment Marine Corps ground and air logistics operations in Operation Enduring Freedom," explained Eric Pratson, Navy and Marine Corps Cargo UAS integrated product team lead. Pratson said K-Max supplements rotary wing assets and reduces exposure to IEDs.

K-Max has been fielded for six months to Central Command to deliver meals and spare parts to FOBs. The aircraft is deployed with Marine Unmanned Aerial Vehicle Squadron 1, Cargo Resupply Unmanned Aircraft System Detachment.

There have been challenges in integrating K-Max into the manned logistics system and in implementing safe and reliable retrograde procedures. "Cargo UAS is still a new capability," Pratson said. "The team continues to refine operations to better suit the Marines who use it." ✭

For more information, contact Editor-in-Chief Jeff McKaughan at jeffm@kmimediagroup.com or search our online archives for related stories at www.mlf-kmi.com.

Self Diagnostics

Gear that helps track its own health can protect mission integrity in the future.

By Peter Buxbaum
MLF Correspondent

In this era of military budget cuts, it is important for the Department of Defense to streamline logistics costs and processes. The more the Pentagon can save on logistics, the more it will have to invest in personnel and systems that will pack a punch during future conflicts.

The armed services deploy, and industry provides, a number of automated self-diagnostic tools that measure critical functions within weapons platforms. These sensors are able to give the green light for deployment of assets or alert personnel of upcoming problems before they become critical. It is important for the armed services to know that any given vehicle, vessel, or aircraft is ready for duty in advance of deployment. Similarly, it is advantageous once in theater for commanders to be apprised in advance of potential problems with a platform that may require maintenance.

Automated tools provide a number of advantages: they reduce costs by allowing maintenance to be performed before a catastrophic failure occurs and they make logistics more efficient by promoting higher levels of readiness and allowing maintainers to order parts in advance. Self-diagnostic systems have been deployed across the spectrum of U.S. military platforms.

"Lockheed Martin has been a leader in the development, integration and maintenance of self-diagnostic systems for more than 30 years," said Kimberly Gavaletz, vice president of enterprise logistics solutions within Lockheed Martin's Global Training and Logistics unit. "Our platforms and maintainers support the U.S. Air Force, Marine Corps, Air National Guard, Navy and more than 25 international customers. We assist commands in optimizing the monitoring and health analysis of their systems, while reducing costs and their logistics footprint." Lockheed Martin's self-diagnostics systems are to found on DDG-51 class ships, combat supply ships, the Joint Strike Fighter, the Longbow fire control radar, and other ground-, aviation- and naval-based platforms.

Honeywell's Health and Usage Monitoring System (HUMS) was originally developed for rotary aircraft but has since been adapted to fixed wing aircraft, ground vehicles and Navy ships. "The technology involves vibration monitoring and is based on sonar technology that came of the Navy," said Chris DeLong, the company's senior manager for technical sales. "We are able to recognize problems by signal processing data collected off a rattling piece of equipment."

Honeywell has completed installation of HUMS for the 160th Special Operations Aviation Regiment's fleet of MH-47G Chinook helicopters and has also signed an agreement to provide the HUMS technology to the unit's entire fleet of MH-60M Black Hawks.

The U.S. Navy uses a patented technology called StressWave Systems, provided by the Scientech division Curtiss-Wright Controls, on its Landing Craft Air Cushion (LCAC) class hovercraft to determine the predeployment readiness of those vessels. The Navy determined that the gear boxes were the key component of the craft that needed to be checked before deployment.

"StressWave gives the green light to deploy," said Curtis Reichenfeld, the company's chief technical officer. "These boats go out for six to eight months at a time. They don't want it to fail during operation." The StressWave technology has also been readied for and tested on ground vehicles and helicopters but has yet to be deployed on those platforms.

Lockheed Martin's work with the U.S. Navy has led to increased turbine performance for DDG-51 class ships and fast combat supply ships, according to Gavaletz. "Working with commands, we've been able to improve the ability to track and analyze engine performance and reduce the number of tools employed for maintenance," she said. "Additionally, our Lockheed Martin Integrated Condition Assessment System monitors the operating parameters of machinery and electronic systems for approximately 100 U.S. Navy ships to provide on-board condition assessment and trending of equipment health."

Lockheed Martin's Autonomic Logistics Information System serves as the information infrastructure for the F-35. The system transmits "aircraft health and maintenance data to technicians and maintainers on a globally-distributed network," explained Gavaletz. "This enables the pre-positioning of parts and qualified maintainers on the ground, meaning that when the aircraft lands, downtime is minimized, efficiency is increased and costs are reduced."

Lockheed Martin provides its built-in-test (BIT) self-diagnostic capability for electro-optical/infrared sensor and missile systems across DoD. Some of the BIT-enabled systems include the Sniper advanced targeting pod, SpectIR, Joint Strike Fighter electro-optical targeting system, Longbow, target sight system, Q-39, Joint Air-to-Surface Standoff Missile, PAC-3 missile, terminal high altitude area defense and medium extended air defense system.

Honeywell's HUMS technology is able to detect out-of-balance conditions and to provide information to a maintainer on where and how to adjust the balance. "On the Chinook, we found that it used to take three to five days to do rotor smoothing," said DeLong. "With our software, they are able to do it in less than a day."

On the Apache helicopter, HUMS detects metal chips in the gear box, an indicator of a serious problem. "Typically crews get warning on the order of minutes before a major problem might occur," said DeLong. "With vibration monitoring, we pick up signals from degrading elements and give them 20 to 50 hours of warning that there is a problem."

On other platforms, HUMS collects, processes and interprets data generated by various components or subsystems such as engines, gearboxes and other dynamic components, and then analyzes the results to identify what needs to be fixed on the helicopter to save time, resources and money. The same data is used to develop trends across a fleet aircraft, vehicles, or vessels. "The system detects anomalies that require further investigation," said DeLong.

Maintenance crews can run diagnostic performance tests of a helicopter on the ground using a laptop interface into the HUMS system. "The HUMS software can then flag potential performance issues for maintenance crews before and after a helicopter takes flight, saving time, fuel and possible operational down time," said DeLong. HUMS can be used on both helicopters and propeller-driven fixed wing aircraft.

Common evaluation methods for self-diagnostics systems include subsystem sensors, vibration and oil analysis. "Information from these sensors can then be relayed to maintainers or analysts by radio frequency downlinks, the internet, or legacy information technology systems," said Gavaletz. Lockheed Martin's "tools often employ digital signal processing to detect machinery vibration levels and laser-imaging to detect and analyze fluids. Vibrations are analyzed using signal processing techniques. We also collect sensor data and use analysis techniques to determine trends and predict failures using neural network technology, statistical approaches and other artificial intelligence automated analysis."

A major focus of these artificial intelligence techniques is to automatically learn to recognize complex patterns and make intelligent decisions based on real-time operational data. Lockheed Martin has employed a variety of heuristic and statistical learning approaches to develop these models. "Our embedded and networked systems are trained using one or more of these techniques to monitor the multidimensional signatures of complex physical systems to detect condition, predict time to maintenance, and probability of impending failure," said Gavaletz.

In the case of the Navy's LCAC, Curtiss-Wright's StressWave technology is hooked up to the component to be tested—in this case, right-angle gear boxes—and the LCAC is run at high speed for about five minutes. StressWave is an acoustic-based, as opposed to a vibration-based system. "The biggest thing about being acoustic based is that it is blind to normal vehicle vibration," said Reichenfeld.

The system detects structure-borne sound through a series of sensors and processes it with artificial intelligence software. "This provides an actual measurement of the true condition of equipment," said Reichenfeld. "It allows for proactive asset management rather than reactive management by detecting and monitoring machine degradation long before vibration or other technologies."

The acoustic, spark plug-sized sensor is tuned to the high frequency 30 KHz to 40 KHz range. "It is listening for acoustic emissions characteristic of metal on metal contact," said Reichenfeld. "We measure and filter acoustic emissions to remove any vibration content. We can actually get down to the particular bearing or gear having an issue."

The end result is a stress wave energy measurement that is correlated to a red, yellow, or green health status. Green means the LCAC is ready to go; yellow and red mean the system has detected abnormal levels of friction.

Deploying self-diagnostic systems can provide a number of predictable benefits. They "provide advance warning of failing components," said DeLong, "and allow more flexibility for prepositioning of spare parts. You don't need as many spare parts on hand in forward positions. The equipment can be positioned back to a central location for maintenance."

The application of the HUMS technology to U.S. military helicopters has helped increase the availability and reduce maintenance costs of its fleet. Studies have shown that the U.S. Air Force has experienced a 66 percent reduction of mission aborts due to vibration over five years; that the fleet of Army AH-64 Apache helicopters showed a 30 percent reduction in mission aborts; and that 71 Army CH-47 Chinook helicopters avoided nearly 3,000 maintenance man-hours over a two-year period.

Self-diagnostics can provide "a huge benefit in availability and reliability and in reducing infant mortality," said Reichenfeld, referring to early component failures, "by testing them in a non-intrusive fashion." Gear boxes coming off a manufacturing line must otherwise be tested by tearing them down and then rebuilding them. This process in itself can cause reliability problems, noted Reichenfeld.

A test of the StressWave technology on combat helicopters showed that the vibration monitoring provided warning of impending failure three days before sensors that detect metal chips in the gear box. "That way the maintenance folks can take care of the prior to next mission," said Reichenfeld. A signal of chip detection in a gear box calls for an immediate forced landing, he noted.

"Lockheed Martin's systems assist commands in optimizing the health monitoring and prognostic analysis of their systems, while reducing their logistics footprint," said Gavaletz. "Our technology also reduces manpower and training requirements. We continue to deliver results in our support of the littoral combat ship's low manning-concept, helping the Navy decrease costs while increasing efficiency. Our BIT technology significantly improves the ability of maintainers to rapidly detect and isolate system-level faults and facilitates the identification of faulty line replaceable units or weapon replaceable assemblies for field-level replacement."

Self-diagnostics systems are likely to be applied to additional military platforms in the future. The Navy's ship-to-shore connector, the successor to the LCAC, will also likely be equipped with Curtiss-Wright's StressWave technology, according to Reichenfeld. "The competitors for the contract have expressed interest in the technology," he said.

The original military application for which the StressWave diagnostic system was developed was for the U.S. Army and was intended for application to helicopter drive train components. The hardware and operating system software are readily adaptable to numerous other applications, noted Reichenfeld.

"On radar systems, it is able to measure increases in friction as the antenna rotates," he said. "It can also be installed on anything having to do with generators, engines and pumps." Curtiss-Wright has also demonstrated StressWave for electro mechanical actuators on-board Air Force aircraft.

Curtiss-Wright is looking to demonstrate its technology on unmanned aerial vehicles, Navy diesel engines and on Army ground vehicles. The company has also developed a dual sensor that can provide both acoustic and vibration monitoring and which can easily replace and upgrade its current vibration sensors.

On Army ground vehicles, the company is ready, willing and able to demonstrate StressWave Systems on three classes of Army ground vehicles and was scheduled to do so until the program ran into a problem more and more common these days: a funding cutoff. Reichenfeld looks forward to the demonstration proceeding once and if funding is restored. ✭

For more information, contact Editor-in-Chief Jeff McKaughan at jeffm@kmimediagroup.com or search our online archives for related stories at www.mlf-kmi.com.

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Larry Scheuble
Senior Vice President
Booz Allen Hamilton

Q: Please provide some background on BAH and the company's work with DoD in the logistics arena.

A: Booz Allen delivers a range of logistics capabilities, information technology and decision support consulting services to the Department of Defense and civil agencies. This encompasses supply chain management, industrial operations, and deployment/distribution/transportation and life cycle logistics.

We support DoD clients in optimizing the capabilities of their respective enterprises across multiple logistics processes. We have designed, developed and deployed capabilities and tools to assist our clients in analyzing, planning and executing their logistics operations.

Q: How would you describe BAH?

A: Booz Allen is a leading provider of management and technology consulting services. Our three major business areas are defense, civil and the security and intelligence markets. The firm's capability areas include: strategy and organization, analytics, technology and engineering, and operations. Our 25,000 employees support clients such as DoD, all branches of the U.S. military, the U.S. intelligence community, and civil agencies ranging from the Department of Homeland Security to the Environmental Protection Agency.

Q: How is BAH helping DoD meet current key logistics objectives?

A: Let me provide some examples:

In the Navy, Booz Allen has been working closely with all elements of the Surface Warfare Enterprise on issues including the current and future readiness of ships and sailors. In the Booz Allen-led "Take a Fix" report and the fleet eview panel on Surface Force Readiness, headed by Vice Admiral (Ret.) Balisle, we discovered the Navy was facing key material and operational readiness challenges. Working side-by-side with the Navy, Booz Allen has helped to reestablish a higher level of self-assessment and self-sufficiency skills across the fleet.

For the Army and the Air Force, we are providing support across program management offices, supply and maintenance organizations, operational commands and HQs. We're also helping them to identify and document issues and develop action plans and roadmaps around some of the services most sensitive logistics issues.

Q: What are some of the new programs you working on?

A: Through support of the Consolidated Afloat Networks and Enterprise Services program, Booz Allen is consolidating existing legacy and stand-alone afloat C4ISR networks. This will result in a smaller infrastructure footprint and reduction in associated logistics, sustainment and training costs.

Booz Allen continues to support special operations forces and USSOCOM's acquisition enterprise remains at the forefront of DoD. Our understanding of USSOCOM's requirements process helps to facilitate a persistent global presence and prepare forces for the full range of contingencies and threats.

Within the Army's Communication and Electronics Command, we have assisted in the development and implementation of a life cycle approach to condition based maintenance–plus.

Q: What are some of the main challenges you are facing in meeting the needs of the 21st-century warfighter?

A: We're adapting to challenges, including:

Increasing complexity brought on by the global security environment: The change in the character of conflict has also altered how our forces are equipped and supported. This includes rapidly integrating and inserting new technology developments for equipment and techniques across DoD. Booz Allen is leading efforts to compress the acquisition cycle and reduce the logistics burden.

Life cycle cost pressures: Sustainment costs can amount to 70 to 80 percent of total expenditures associated with material/platform over the entire life cycle. The complexity of these systems has grown with technology updates and insertions, and so too has time in service. We, along with our clients, are finding ways to reduce life cycle cost.

Q: How is BAH preparing for the future?

A: Booz Allen operates in a manner that is agile and highly client-focused. Our highest calling is client service. We are committed to maintaining our culture of excellence as our foundation for 2012 and the future. Our model allows us to deploy our most talented people to address our customers' challenges, and plays a role in how we efficiently manage capital, infrastructure and operations.

Q: How has BAH positioned itself and prepared for 2012?

A: We have redoubled our efforts to understand the political, fiscal, global and mission changes that drive our clients' needs. As a firm, we are aligning our business against growing market areas. One example of this is cyber. In January, we introduced our Cyber Solutions Network. Additionally, we understand that our clients are mission-driven, so we have developed a firmwide approach to addressing organizational efficiency and effectiveness. "Government Efficiencies" focuses on strategic analysis and core missions, and provides an institutionalized approach to efficiencies.

Q: What are your goals for 2012?

A: To maintain the highest service levels to our clients, and to continue to identify growth potential in markets including health, C4ISR and finance—as well as in targeted commercial markets of health care, financial services and energy, and in the international arena in the Middle East. Booz Allen, with its worldwide footprint, agile operations and commitment to client quality service, is well-positioned to take advantage of available opportunities. ★

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