Blue Force Tracking
Leaps Forward

ID: Friend or Foe
Vehicle Recognition Software Saves Lives

PEO Corner
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Ground Combat Systems
Warren, MI

Forward-Looking Infrared
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Armored BCT: Abrams/Bradley
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Industry Spotlight: EO/IR
Raytheon helps give American forces a decisive edge so that they may “own the night” for years to come.
By Michelle Lohmeier

A Total Force Command
Gen. Paul J. Selva, Commander, Air Mobility Command (AMC), spoke to A&M about providing rapid global mobility and sustainment for America’s armed forces.

Balancing Survivability with Lethality
Army PEO Ground Combat Systems is keeping Armored Brigade Combat Team Bradley and Abrams platforms lean, mean, and mobile.
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Cover: Photo depicts an M109A6 Paladin, a 155-mm self-propelled howitzer. Under PEO Ground Combat Systems, the Paladin is currently being modernized. (Army)
This year witnessed both successes and challenges for a U.S. Defense Department tasked with balancing the growing weight of sequester cuts at home with continuing force drawdown and redeployment from Afghanistan. Progress in EMD to Test Phase development of the JLTV and ongoing modernization of the Abrams and Bradley platforms were tempered by program cuts to Marine Corps AAV replacement and Air Force C-17 contract renewal. In the midst of all this chaos, a government shutdown seemed like the proverbial “icing on the cake.” Well, good news folks, the holiday season is almost here, one certain to bring military families and their returning servicemembers enough reason to cheer.

In this, the November 2013 AUSA issue of Armor & Mobility, we shed light on the “bread and butter” or, if you prefer, “meat and potatoes” of DoD’s tactical force: the people behind the communications, armor, and lift who make missions happen. At the forefront of this medley, Army Program Executive Office for Ground Combat Systems (PEO GCS) recently welcomed its newest leader, BG David G. Bassett. A&M was among the many beneficiaries of his arrival, as he offers readers a look into ongoing and forward-looking goals and initiatives being addressed at PEO GCS. On the comms front and down to the foot soldier, an inside perspective into the latest integration of interactive capabilities for Army Blue Force Tracking and Force XXI Battle Command Brigade and Below (FBCB2)-controlled operations provides a look into an almost futuristic world of ground tactics.

A&M continues its tribute to the 50th anniversary of Forward-looking Infrared (FLIR) technology in support of U.S. military operations. In a feature to A&M on the state of the Army’s Recognition of Combatant-Vehicles (ROC-V) program, Program Manager for Night Vision/Reconnaissance Surveillance and Target Acquisition (PM NV/RSTA) speaks to the technology enhancements the Army is implementing to enhance ID Friend or Foe (IFF) capabilities available to tactical vehicle operators. From ground to air, we interview General Paul J. Selva, Commander, U.S. Air Force Air Mobility Command (AMC), on the extraordinary efforts comprising daily AMC operations. We also spotlight the critical role its Tanker Airlift Command Center (TACC) plays in keeping DoD assets, from people to equipment, on the move in complex global operations.

To put a wrap on another outstanding year of A&M, Sierra Army Depot, one of DoD’s largest tactical vehicle sustainment installations, provides readers with a look into a uniquely efficient world of platform enhancement and reset.

As always, feel free to contact us with questions or comments!

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Already in soldiers’ hands for evaluation, the system known as Joint Battle Command-Platform (JBC-P) could receive full-rate production approval as early as this year. Once fielded, it will revolutionize how lower echelons communicate and navigate on the battlefield.

“JBC-P is very user-friendly down to the lowest level, which is important because you never know who’s going to need to use the program,” said 1st Lt. Chris Emmons, 2nd Brigade, 1st Armored Division (2/1 AD). “You actually want to use it because it’s quicker than getting on the radio or having to interrupt somebody.”

This latest incarnation of the widely fielded friendly force tracking system known as Force XXI Battle Command Brigade-and-Below/Blue Force Tracking (FBCB2/BFT) is the second part of a two-step upgrade. Now being fielded is Joint Capabilities Release (JCR), which brings a faster satellite network, secure data encryption, Marine Corps interoperability, and improved chat messaging.

Primarily used in vehicles, the situational awareness capability helps reduce the “fog of war” by showing a complete picture of the battlefield so units can synchronize operations and reduce fratricide.

Today, FBCB2 is integrated on more than 120,000 platforms, resides in each Tactical Operations Center, and is fielded or authorized to every brigade combat team in the Army.

“From FBCB2 through to the new system, there have been loads of changes,” said Staff Sgt. Lance Bradford, also with the 2/1 AD. “It’s very user-friendly. They adopted a lot of the same steps that were in the old FBCB2 portion, and it’s just redesigned. All the buttons are self-explanatory, so everything that we need, it shouldn’t take longer than 30 seconds to find.”

Both Emmons and Bradford evaluated FBCB2’s upgrades during several Network Integration Evaluations (NIEs), the Army’s semiannual field evaluations designed to keep pace with rapid advances in communications technologies and deliver proven and integrated network capabilities to soldiers.

A Revolution in Mounted Mission Command

JBC-P, which is developed and fielded by Project Manager (PM) JBC-P, assigned to the Program Executive Office Command, Control and Communications-Tactical (PEO C3T), has undergone several successful risk reduction events leading up to its Initial Operational Test and Evaluation (IOT&E), held during NIE 13.2 last May. A full-rate production decision is scheduled for later this year. If successful, JBC-P would begin fielding in 2014.

“This is a significant advancement in mounted mission command with improved linkages with dismounts, command posts, and the joint force,” said Col. Michael Thurston, PM JBC-P. “We’ll continue to increase capability and make it more intuitive for today’s soldier.”

For the past 11 years of war, soldiers have used FBCB2, and now JCR, to monitor blue icons on a computer screen inside their vehicles to locate and identify teammates, coordinate an attack, and prevent fratricide. They can also map out improvised explosive devices (IEDs) and enemy locations with red icons on the same computerized topographical map that alerts other friendly units nearby.

When soldiers travel beyond a radio signal’s reach, they can keep in touch by sending text messages through FBCB2’s BFT satellite network. Both the speed and accuracy of that network have improved with JCR due to BFT 2, a new satellite infrastructure that can handle...
Primarily used in vehicles, the situational awareness capability helps reduce the “fog of war” by showing a complete picture of the battlefield so units can synchronize operations and reduce fratricide. Significantly more data than the first BFT. This capacity increase allows for more frequent, larger message traffic, and in many cases cuts the system’s refresh rate from minutes to seconds.

**The Key: Increased Situational Awareness**

JCR acts as a “bridge” between the legacy FBCB2 and the new JBC-P. Last October, JCR began fielding to Afghanistan prior to and as part of Capability Set 13 (CS 13), an integrated fielding effort of communications equipment that spans the entire brigade combat team formation, connecting the fixed command post to the commander on-the-move to the dismounted soldier.

The JCR upgrade also brings JCR-Logistics, which for the first time on the battlefield allows maneuver and logistics forces to share situational awareness and message exchange. Logistics vehicles in Afghanistan—freight haulers, Heavy Expanded Mobility Tactical Trucks, and fuel tankers that transport goods on the battlefield to feed, fuel, and arm maneuver formations—are now equipped with JCR Logistcs.

“This does a number of things on the battlefield, but increased situational awareness is key,” said Lt. Col. Bryan “BJ” Stephens, who served as product manager Blue Force Tracking for PM JBC-P until September 2013. “Before, MTS was a standalone network and separate software baseline. Now, logistics get the same mapping capability [and] the same operational picture, and they pick up the same unclassified message sets as maneuver forces.”

JBC-P, slated to replace JCR in fiscal year 14, allows beyond-line-of-sight communication of voice, data, and images between dismounted soldiers, vehicles, aircraft, and higher headquarters. It will also introduce soldiers to a new user interface, a product of direct feedback from the U.S. Army Training and Doctrine Command–led user juries.

**Anticipating and Mitigating Risk**

Also incorporated on JBC-P is Areas, Structures, Capabilities, Organizations, People, and Events (ASCOPE) Capability, part of the Tactical Ground Reporting (TIGR) system. ASCOPE is used for mapping the human terrain that allows commanders to plan, anticipate, and mitigate operational risk. It also allows for the tracking of people such as local police chiefs, religious leaders, or other key figures for counterinsurgency and stability operations. JBC-P users “create” and “search” for the ASCOPE data in TIGR, a tactical web-based information management system that uses a Google Earth-like interface, pictures, and text to provide a searchable database of unit activities.

TIGR can also disseminate tactical information across multiple Army echelons and systems, and it can be used in almost any environment to show historical data of occurrences in distinct locations. It allows for Intelligence Preparation of the Battlefield (IPB), which identifies the operating environment, assesses the characteristics of the battlefield environment such as weather and terrain, and helps drive what friendly and enemy courses of action (COAs) transpire based on that assessment. TIGR allows commanders to survey the entire environment (both physical and human terrain) and develop COAs to accomplish the mission. At the company level, TIGR is the only system that provides both operations and intelligence convergence on a single system and is designed for capturing information at the lowest tactical level. With TIGR, users can assess, plan, prepare, execute, and debrief at all levels in support of the full spectrum of operations.

“TIGR provides a unique capability,” said Capt. Joseph Perry of the 2/1 AD, who also evaluated JCR and JBC-P at the NIEs. “You download the information from your TIGR server onto your JBC-P, and you can then access it as needed. And when you get back, you just re-download the information or upload more information that you created. So it helps facilitate rapid information or intelligence transfer.”

Another significant step with JBC-P comes with the introduction of networked handheld devices that will deliver a new level of mission command to small units through the Network Services Gateway (NSG), an additional capability introduced to the JBC-P software product line to fill beyond-line-of-sight shortfalls within the operational environment. The NSG leverages an Internet protocol (IP) interface from standard JBC-P computer hardware to the handheld end-user devices (EUD), which are connected to soldier-worn tactical radios.

Through this capability, leaders in vehicles and command posts for the first time will be able to view the precise locations of dismounted forces. A handheld version of JBC-P software will run on the Nett Warrior EUDs, connected to the tactical network via the Rifleman Radio and Soldier Radio Waveform (SRW). This combination will deliver timely blue force tracking information down to lower-echelon soldiers, specifically at the team leader- through platoon-leader level.

**Looking Ahead**

PM JBC-P has continued to use soldier feedback from the NIEs as well as from theater and user juries to incrementally improve the FBCB2/BFT system.

Since April 2009, the Army and Marine Corps have conducted 11 user juries, held with multiple formations and at various installations that focus on feedback from recently redeployed, experienced system users. PM JBC-P works closely with the Army’s TRADOC Capability Manager (TCM) for Brigade Combat Team Mission Command (BCT MC) in evaluating feedback.

“We work collectively by ensuring that developing systems meet the warfighters’ needs, focusing research and development on the most critical gaps, and validating capabilities and requirements with the user,” said Dan Dwyer, senior program integrator for TCM BCT MC. “This approach, where quality feedback is more important than quantity, has allowed us to continue to meet our joint services’ desires to provide the very best mission command capabilities to our warfighters.”

More info: peoc3t.army.mil/jbcp
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Meeting POC: Meredith Hawley

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Meeting POC: Meredith Hawley

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A&M: Please speak to your role as the Program Executive Officer for Ground Combat Systems and vision moving forward at your new command.

BG Bassett: I am very humbled by this opportunity to lead such a great organization and one that makes such a difference for our soldiers every day. We only succeed as a team when our Product Managers deliver, sustain, and upgrade the systems and critical capabilities to our soldiers. In a nutshell, that is my vision as the new PEO Ground Combat Systems. We perform that mission inside of an acquisition process that we must both follow and tailor to ensure that we’re delivering the best value possible for the resources the Army entrusts to us. Our soldiers depend on us to fight, successfully complete their missions, and return home safely, so we have to ensure we are not only “doing things right” but also “doing the right things.”

From July 2009 to May 2012, Brigadier General David Bassett served as the Army’s Project Manager for Tactical Vehicles within the Program Executive Office for Combat Support & Combat Service Support (PEO CS&CSS). In June 2012, Tactical Vehicles was restructured, and he was tapped to lead the Joint Program Office, Joint Light Tactical Vehicles, PEO CS&CSS, through the Engineering and Manufacturing Development award, from June to August 2012.

In September 2012, BG Bassett assumed responsibilities as the Deputy Program Executive Officer for CS&CSS. Here he provided technical and managerial oversight for approximately 270 tactical wheeled vehicles, special purpose vehicles and equipment, physical security equipment, petroleum and water systems, and other support systems/equipment for the U.S. Army and sister services, as well as foreign military sales.

BG Bassett became the Program Executive Officer for Ground Combat Systems in September 2013. The ground combat systems portfolio has an annual budget of over $2.9 billion, with a total program budget of over $18.5 billion (FY14-18).

BG Bassett was interviewed by A&M Editor Kevin Hunter.

As the PEO, I really look at my job as having three main tasks: develop, build, and ensure the sustainment of the Army’s Ground Combat Systems, take care of the PEO GCS workforce, and build our bench of acquisition professionals for the future. Taking care of our workforce is critical as they are key to every mission we accomplish. They are the dedicated professionals and analytical thinkers we need in order to accomplish the mission set forth by the Army. As leaders, it is our legacy to build people and ensure that we develop our future acquisition leaders and combat vehicle developers.

At the end of the day, no one in the world is better at managing combat vehicles and unmanned systems than this organization. It’s my job to ensure we maintain this tremendous workforce and capability for our Army.

One additional mission area that has become especially critical as our resources have been reduced and some systems that have been in active production for many years begin to transition into sustainment is the need to ensure the viability of our industrial base. That industrial base includes our organic depots and arsenals as well as the unique manufacturing facilities that support our combat vehicle production that are owned or operated by our partners in industry. We have initiated an in-depth evaluation of not only our prime vendors but are also looking much more deeply into the underlying network of suppliers that are so critical to our combat vehicle fleets. This assessment provides substantially greater insight into the specific areas of risk in our industrial base than we’ve had in the past.
A&M: Please speak to PEO GCS’ evolution over the past decade of war lessons learned and how the command has changed focus to meet Army needs.

BG Bassett: Over the course of the last 12 years of ongoing combat operations, the Army has made dramatic improvements to all our combat platforms (in terms of survivability and in a whole host of advancements) as we’ve continued to move towards a more digitized battlefield. Our tank and Bradley average fleet ages are at historic lows as those systems have gone through recapitalization over the last few years.

Unfortunately, through the course of all of those changes, our platforms have become heavier, less mobile and transportable, and are reaching their limits in terms of automotive capacity and power generation to support the vast array of digital systems that are now such an integral part of our combat formations. In addition, those platforms have not seen substantial upgrades to their lethality systems that will be needed to ensure that our forces have a clear asymmetrical advantage in firepower in every fight.

When you look at the main investments that we are planning in the next few years, we are focused on restoring the automotive performance that has eroded as we’ve added protection to our vehicles, upgrading those systems to carry the Army’s future network, and replacing some obsolete platforms in the inventory through programs like Ground Combat Vehicle (GCV), Armored Multi-purpose Vehicle (AMPV), and Paladin Integrated Management (PIM). We’re also beginning to explore options for future upgrades to enhance the lethality of our combat formations including the infantry brigade combat team.

We realize that this budget environment will force some difficult choices between options, all of which would add substantial combat capability to our formations. Those choices must be made with as much analytical rigor as possible. Fortunately, over the past few years PEO GCS has developed two vital tools to help guide us as we make resource allocation decisions. The first is the Capability Portfolio Analysis Tool (CPAT), and the second is the Whole Systems Trade Analysis Tool (WSTAT).

CPAT provides PEO GCS with the ability to evaluate highly complex modernization optimization problems over multiple capability sets of platforms, mission roles, and funding profiles in terms of capability, cost, and schedule. It allows us to take a holistic view of our portfolio, rather than one system at a time. From here we can really drill down and see where we are getting the most for our resources. CPAT enables us to take a 10,000-foot view of the entire combat vehicle portfolio, and in an unbiased manner it shows us the best way to spend our money and give us the greatest leap forward. While we understand that CPAT will not answer every analytical question that arises, the tool gives us the unique capability to assess our portfolio holistically.

With CPAT in use to support portfolio investment decisions, PEO GCS initiated the development of a program centric trade analysis tool that holistically analyzes a platform at the sub-system level. The Whole Systems Trades Analysis Tool (WSTAT) has been developed and implemented in the PM GCV and Bradley modernization initiatives and has assisted decision makers in understanding the trades in both the requirement and technical arenas. The tool forces us to answer and address tough questions, for example whether we should upgrade the Bradley or design a brand-new infantry fighting vehicle. It allows us to balance the complex relationship between requirements, design, and other elements like cost and schedule to see where we can get the most out of our resources.

A&M: How is PEO GCS working to ensure the current armored vehicle fleet retains its qualitative advantages?

BG Bassett: Over the past decade the only thing that has been able to slow the Army’s premier combat vehicles haven’t been enemies on the battlefield, but rather the technological advancements added to the platform. While every vehicle is designed to have space, weight, and power-cooling (SWaP-C) margins for incremental improvements, recent upgrades made to the Abrams M1A2 SEP V2 and Bradley Fighting Vehicle have left little margin for future enhancements.

To help alleviate SWaP-C constraints, the Army has launched the Abrams and Bradley Engineering Change Proposal (ECP) programs designed to buy back as much SWaP-C as possible by redesigning and modernizing many elements of the platforms. These ECPs are modifications to the system that leaves the essential capability unchanged.

The Abrams ECP program will help ensure the Army can seamlessly incorporate other programs of record into the Abrams well into the future, without degrading operational performance. The centerpiece of the first ECP upgrade will be to restore lost power margin through the integration of a larger generator, improved slip ring, battery management system, and a new power generation and distribution system.

To ensure the Bradley can enable the Army’s network investment and incorporate other Army programs of record without further degrading operational performance, basic improvements will be made as part of the upcoming Bradley ECP program. The Bradley ECP efforts are focused on integrating the network and improving counter-IED capability by regaining ground clearance.

A&M: What improvements have you seen recently in the capability of unmanned ground systems?

BG Bassett: As we look at the battlefields of the future, one cannot help but see robotic systems as a key enabler of future operations. Both the Army and Marine Corps have procured a large number of robotic systems through the course of supporting operations in both Iraq and Afghanistan and our biggest near term challenge is determining which of those robots become part of the enduring force structure and taking the steps necessary to provide for their sustainment, training, and support.

Budget reductions, cuts to troop end strengths, and asymmetric threats have forced researchers to address where potential robotic systems can not only replace soldiers in harm’s way but also enhance the capability of the force. Moving forward, robotic systems have to be able to function with limited oversight and control by the soldier. They need to evolve to become a member of a squad capable of performing a mission without burdening troops for guidance, navigation, and manipulation typical of today’s fielded teleoperated systems.

The Robotic Systems Joint Project Office  is continually looking to improve autonomous capabilities so systems can perform multiple missions, have modular payloads and are able to work within a teaming environment. We are leveraging both internal and external talents through established working relationships with all four services’
technology bases and by identifying near-, mid- and long-term needs for unmanned ground systems. The Autonomous Mobility Appliqué System, currently being developed by our team, will allow any ground vehicle in the motor pool to be piloted autonomously. This appliqué kit would consist of a series of cameras and sensors that would be fitted to the vehicle. The first increment calls for tactical wheeled vehicles to be fitted with the system, then route clearance vehicles, and finally ground combat systems.

A&M: Feel free to discuss any accomplishments or objectives PEO GCS has achieved or is working to bring to fruition.

BG Bassett: The team released an updated draft request for proposal (RFP) earlier this month to industry for the AMPV, a materiel solution replacement for the M113 to mitigate current and future capability gaps in force protection, mobility, reliability, and interoperability by mission-role variant to support the armored brigade combat team across the spectrum of conflict. The AMPV will replace the five mission roles currently performed by the M113 by transferring the current M113 Mission Equipment Packages to a new vehicle platform. The team is working hard to release the final RFP to industry in November.

Additionally, the PIM System is getting ready to head into Low Rate Initial Production as its Milestone C is anticipated to be completed in mid-October. The PIM is a modernization program, not a sustainment effort. These vehicles have a brand new chassis, engine, transmission, suspension, steering system, and electric ramming system. The PIM platform puts the Self-Propelled Howitzer into the 21st century and should allow the Army to use the M109 Family of Vehicles for the next 50 years.

We also just recently received approval for the procurement of a third brigade of Stryker Double V-Hull (DVH) vehicles. The initial 66 vehicles are being awarded now with the remainder planned in the future. The procurement of this brigade, which consists of 337 total vehicles, will be based on the availability of funding using an incremental approach. The Army expects to execute the entire procurement during fiscal years 2014-2016, dependent on funding.

To maximize the use of fiscal resources, the Army and industry developed the DVH exchange program to validate if components from the traditional Stryker flat bottom hull variants could be expeditiously refurbished and installed on a new, more survivable DVH, at less cost than producing a new vehicle. The process includes reusing common parts from flat bottom hulls, refurbishing them, and re-using the parts in the new DVH structure. The initial exchange vehicles were so successful that the Army has agreed to produce the 337 vehicles for the third brigade using this process.

More info: www.peogcs.army.mil

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After years of adding weight and power, the Army’s Program Executive Office for Ground Combat Systems is working to keep the service’s premier armored platforms mobile, interoperable, and survivable.

By Kevin Hunter, A&M Editor

**M1A2 Abrams**

Over the past decade the only thing that has been able to slow the Army’s premier combat vehicle has not been enemies on the battlefield but rather the technological advancements added to the platform. While every vehicle is designed to have space, weight, and power (SWaP) margin for incremental improvements, recent upgrades made to the Abrams M1A2 SEP V2 have left little margin for future improvements.

To help alleviate SWaP constraints, the Army has launched the Abrams Engineering Change Proposal (ECP) program, which is designed to buy back as much SWaP as possible by redesigning and modernizing many elements of the tank. This ECP is a modification to the system that leaves the essential capability unchanged. The Abrams ECP program will help ensure the Army can seamlessly incorporate other programs of record into the Abrams well into the future without degrading operational performance.

“Right now electrical power is in short supply on the tank,” said Lt. Col. Brad Hodge, the Army’s product manager for the Abrams. “The centerpiece of the ECP 1 upgrade will be to restore lost power margin through the integration of a larger generator, improved slip ring, battery management system, and a new power generation and distribution system.”

Other major Abrams ECP upgrades will focus on communications, data transmission and processing, and survivability. The communications upgrade will integrate the Joint Tactical Radio System (JTRS) and Handheld, Manpack, & Small Form Fit (HMS) into the Abrams, replacing the current Single-channel Ground and Airborne Radio System (SINCGARS).

The ability to incorporate the Army’s network is also a vital part of the ECP 1 effort. To address network requirements, the Abrams will integrate a gigabit Ethernet databus to allow greater data processing and transmission. The modified slip ring on the turret will also provide both more power and the ability to transmit larger amounts of data into the turret. “The ECP 1 upgrade is set to posture the tank to accept the Army network components in the near term while building the necessary margin to accept future capabilities in the decades to come,” Hodge noted.

Even as the Abrams remains the dominant vehicle on the battlefield, the ECP program will make it more formidable by including a new armor solution as well as an updated version of the Counter Remote-control Improvised Explosive Device Electronic Warfare (CREW) system.

**M2 Bradley**

Since the Bradley Fighting Vehicle was first introduced to the Army in 1982, it has been constantly modernized; however, the upgrades conducted over the past decade have been particularly taxing to the platform.

It is important to remember that armor improvements and the Bradley Urban Survivability Kit (BUSK) make today’s Bradley very
different than those that rolled into Iraq in 2003. The Army has not stopped improving its capabilities, but the vehicle has reached the limit of new capabilities it can accept without making some basic architectural improvements.

The Bradley’s current configuration has hit limits in space, weight, and power-cooling, or SWaP-C, leaving little room for integrating future capabilities. During the conflict in Iraq, the Army upgraded the Bradley to improve the protection of soldiers. These modifications included improved armor, integration of the BUSK, and CREW devices. “The improvements, while extremely effective, increased the weight and electrical power consumption of the vehicle to the point that there is little remaining margin to add new capabilities,” said Lt. Col. Troy Denomy, the Army’s product manager from Bradley and Armored Knight.

This problem is only becoming more serious with the need to integrate the Army’s new network systems—the Warfighter Information Network-Tactical (WIN-T), JTRS, and Joint Battle Command-Platform software—and other systems such as next-generation CREW devices, all of which require additional SWaP-C or computing capacity to operate.

To ensure the vehicle can enable the Army’s network investment and incorporate other Army programs of record without further degrading operational performance, basic improvements will be made as part of the upcoming Bradley ECP program. Like the Abrams ECP, these modifications leave the essential capability unchanged. The Bradley will maintain its classic look on the outside, but it will be quite different under the hood.

The current Army plan breaks the Bradley ECP changes into two iterations. ECP 1 is designed to address the weight growth of the vehicle with early delivery of some mature products. It includes four capabilities: extended life; heavy weight tracks designed for larger vehicle weights; heavy weight torsion bars that will restore ground clearance lost to increased weight, improving cross-country mobility and underbelly blast protection; and improved durability road arms and shock absorbers made to reduce operating costs and maintenance intervals.

ECP 2 is focused on meeting electric power generation and computing requirements for network systems. The intent of the Bradley ECP program is not to degrade the performance of the vehicle. “If we simply added a larger generator to the current vehicle, we would get more electrical power, but at the expense of less automotive power for speed, acceleration, and cross-country mobility,” said Denomy.

To address this issue, ECP 2 will include an upgraded generator and power distribution system, but the Bradley will also require an engine and transmission modification to ensure automotive capability is not lost in order to power network systems. “With the ECP program, the Bradley will be able to keep pace with Army modernization, remaining capable and relevant into the next decade and beyond,” said Denomy.

Computing and data handling capability will also weigh heavily in the ECP effort. The digital bus architecture of the Bradley will be improved through incorporation of common intelligent displays, a better slip ring, an upgraded Ethernet switch, and VICTORY computing architecture standards, all of which will contribute to the integration and handling of the large volumes of data that new Army network systems require.

Current plans are to apply both ECPs to just over 15 brigades, or about 1,860 vehicles. Some ECP 1 components are projected to be delivered to the field from 2015 through 2019. ECP 2 will begin engineering design in 2013 and is scheduled for initial fielding in 2018. (All dates in fiscal years.)

“The ECP effort is a total system solution to manage vehicle [SWaP] to enable the network,” said Denomy. “We’re taking the opportunity to deliver the weight management pieces early, since they are the most ready, while we complete the engineering of the rest of the changes. That way we can ensure a constant flow of improvements to the field.”

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Armored Vehicles Abrams & Bradley Upgrades
How a long-running, constantly improving software training program helps soldiers and Marines avoid fratricide.

By Mr. John O’Connor and Dr. Christina Bates
PM Terrestrial Sensors

Shortly after midnight on March 25, 2003, two British Challenger II tanks near Basra, Iraq, were engaging pockets of Iraqi soldiers near a bridge over the Qanat Shat Al Basra Canal. One of them was using its thermal sights to observe a possible target, reported by the battle group headquarters (HQ) as an enemy bunker position. In actuality, HQ misidentified this target; it was the other Challenger II. The tank commander requested and received clearance to shoot the misidentified “enemy.” When the dust cleared, two British soldiers were killed, and two others were seriously injured. This incident would prove to be one of several instances of combat vehicle fratricide that occurred during Operation Iraqi Freedom (OIF).

Misidentification of vehicles has been the major cause of combat vehicle fratricide since they were introduced to the battlefield in the First World War. During Operation Desert Storm in 1991, the predominant cause of fratricide was errors of identification of combat vehicles. As a result, training in the recognition and identification of friendly and enemy combat vehicles was identified as an essential course of action to remedy this problem.

In response, the U.S. Army and U.S. Marine Corps (USMC), which together have more than 300,000 combat vehicles, supported development of the Recognition of Combat Vehicles (ROC-V) family of training products to improve the target acquisition skills of both soldiers and Marines. The overall intent was to increase accuracy of identification—that is, the ability to correctly identify a specific vehicle model, as opposed to a general vehicle class (tank or truck) or category (friend or enemy)—and therefore reduce the risk of fratricide. Thus far, the ROC-V Program has directly contributed to significant reductions in incidents of fratricide in both OIF and Operation Enduring Freedom (OEF). As a government-developed program, ROC-V is also a very affordable and highly effective training option. Moreover, the Army is now leveraging the data generated to develop ROC-V to better test system performance in isolation by controlling for operator knowledge and expertise.

**ROC-V: From Idea to Reality**

Prior to the ROC-V family of products, the Army relied on flashcards, equipment recognition guides, and even playing cards to assist Soldiers in the identification of combat vehicles. While these provided helpful information, they depicted line drawings and photographs of vehicles and, as such, were not effective in measurably reducing the risk of fratricide. Clearly, the Army needed a more robust training approach to address this serious issue. That training would ultimately come to fruition as ROC-V. Unlike flashcards, ROC-V uses actual thermal and visible vehicle images to ensure the commonality, consistency, realism, and relevance required for training to be effective in measurably reducing both the risk and actual occurrences of fratricide.

ROC-V is a Microsoft Windows–based, stand-alone, customizable, and interactive training program for visual and thermal target identification. It is available on the internet and in DVD format. Leveraging modeling and simulation techniques and working from a vehicle image database comprising more than 350,000 images, ROC-V teaches users the unique patterns, shapes, and thermal signatures of more than 275 U.S. and foreign vehicles. The training is fully customizable; the tasks, conditions, and standards can be adjusted through an instructor control module to meet specific user needs. For example, instructors can create tailored vehicle sets and adjust the number of questions as well as pass criteria for performance exercises and tests. Additionally, the training software is able to store user progress and to generate after-action and test reports based on the standards identified by the instructor. ROC-V training and testing methodologies were also validated by both the All Service Combat Identification and Evaluation Team (1999) and the Training and Doctrine Command (2003).

The ROC-V Program’s objectives were aggressive from the start: to build a vast database and library of actual thermal and visible images of hundreds of combat vehicles under a variety of conditions, ranges, and aspects and to conduct structured, longitudinal testing to determine, from a human factors and cognition perspective, the vehicle features (i.e., unique identifiable features) which are most helpful in achieving an accurate vehicle identification. It has long been understood that soldiers (and in fact, humans in general) determine most target identifications based on visual cues. On the battlefield, time is of the essence, making both accurate and rapid identification essential. Therefore, what the ROC-V team (comprised of a group of researchers and scientists at the Night Vision and Electronic Sensors Directorate (NVESD), located at Fort Belvoir, VA) set out to determine was precisely which vehicle features would lead to accurate and timely vehicle identification. One of the keys to the team’s success would be to determine these features, through rigorous perception studies, and then to leverage state-of-the-art training technology, in conjunction with ROC-V’s vast imagery database, to create training that would prepare soldiers to hone in on particular features and quickly make an accurate identification.
With this major task in hand, the ROC-V Team embarked on two years of research to design the first iteration of the ROC-V software. Continued research into effective training methodologies, coupled with the incorporation of soldier and Marine feedback has been conducted since 1995. Since then, the team has conducted over a dozen research studies, benefiting from the participation of hundreds of soldiers and Marines. In addition, it built a robust vehicle image database that would ultimately comprise more than 350,000 images of nearly 500 vehicles and vehicle variants collected in the visible, short-wave infrared (SWIR), mid-wave infrared (MWIR), and long-wave infrared (LWIR) wavebands from both ground-to-ground and air-to-ground perspectives. To build a library of accurate and clear images for training, the team developed and implemented innovative methods for collecting infrared and visible images that could also support development of real-time simulations. The Army’s major vehicle image simulations, the Night Vision Image Generator and the Simulated Environment Core, rely on ROC-V images to generate their thermal vehicle models.

**Putting ROC-V to the Test in Iraq**

Though it was first fielded in 1997, largely based on lessons learned from Desert Storm, the first major combat test for ROC-V was Operation Iraqi Freedom (OIF). Elements of the US Army 3rd Infantry Division and the U.S. 1st Marine Expeditionary Force, as well as the UK 3rd Armoured Division and 20th Armoured Brigade, used the ROC-V trainer shortly before the start of OIF operations. To date, there are no reports of a ROC-V trainee or ROC-V-trained unit involved in any of the several fratricides that occurred during the operation.

**Reaping the Benefits of ROC-V**

As a government-developed capability, ROC-V is a highly effective and affordable training program. The approximately $2 million per year of program costs includes: software development, distribution, and sustainment, including the addition of 40-50 new and updated vehicles per year, as well as updating the software to meet new requirements, such as integration into new Army training systems. More importantly, knowledge gleaned from ROC-V training enables soldiers to successfully perform critical missions, such as target acquisition, without depending on target identification technologies that are susceptible to failure. Improved combat vehicle identification skills also enable better intelligence collection and situational awareness. For example, an accurate identification of a threat vehicle such as a T-54 might indicate that troops face third-echelon forces. Whereas if the vehicle is a T-80, troops would likely know they face elite units. In both examples, accurate identification of an enemy combat vehicle will inform and influence the selection of a course of action.

The ability to accurately identify coalition forces’ combat vehicles is essential; the potential for interoperability increases as the level of fratricide risk decreases. If coalition forces cannot identify one another, they cannot be effective and the mission suffers. NATO has acknowledged that the lack of combat vehicle identification skills decreases the effectiveness of, and willingness to participate in, coalition operations.

ROC-V’s vast vehicle imagery library is an invaluable database. Beyond its use as the foundation for ROC-V training, the signature data meets precise standards designed to support both the training needs of soldiers and Marines and the needs of the modeling and simulation community. For example, ROC-V data has been incorporated into simulations by the National Ground Intelligence Center; NVESD; PEO Simulation, Training, & Instrumentation(PEO STRI); and other DoD agencies. The official DoD sensor performance model, known as NV-IPM, was also developed using ROC-V data.

Moreover, because ROC-V research was able to determine those human factors which contribute to the accurate identification of a combat vehicle, this data can be used to isolate the influence of operator expertise on system performance. If operator expertise, considered a variable impacting system performance, can be appropriately isolated, then a system may be more accurately assessed from a performance perspective.

**Eliminating Fratricide: The Future of ROC-V**

Since its initial fielding, soldiers have highly praised ROC-V. As such, it is used extensively in the Army and USMC and is required training for a number of military specialties and weapons systems. Additionally, ROC-V is embedded in the Force XXI Battle Command Brigade and Below Blue Force Tracker and Joint Battle Command-Platform systems. ROC-V training is now required for some Military Operational Specialties, including all rotary wing aviators, LRAS3 and BETSS-C operators, and USMC armor units, and for all optical sensor operators. In the past, funding has originated from the Joint Forces Command, the USMC, and several Project Managers and Product Managers including: PdM Forward Looking Infrared Sensors (now known as PdM Ground Sensors); PdM Meteorological and Target Identification Capabilities; PM Light Armored Vehicles; PM Night Vision/Reconnaissance, Surveillance, and Target Acquisition (now known as PM Terrestrial Sensors); PM Soldier Systems; and PdM Combat ID.

Fratricide is a real and major threat; in effect, poor vehicle recognition puts our own weapons against us, leading to heart-breaking mistakes. While loss of life is an unfortunate but inevitable outcome of conflict, casualties resulting from fratricide can be avoided. The ROC-V Program has proven that, with the right training, warfighters can, and do, accurately identify combat vehicles in the midst of dangerous and stressful situations.

More info: peoiews.apg.army.mil/nvrsta
As consumers, we demand high definition in all of our appliances—TVs, Smart Phones, Tablets—and we demand that level of fidelity and connectivity 24/7/365. Soldiers are no different. For the last twenty years, since U.S. forces first began to “own the night” through the employment of advanced thermal imaging, soldiers have demanded that capability in all that they do. It allows our warriors to dominate the battlefield not just at night but all the time.

This year Raytheon and the DoD celebrate 20 years of innovation and development of second-generation FLIR (forward looking infrared)—a technology that has given warfighters the ability to detect, recognize, classify, identify, and engage ground and aerial targets in all conditions, day or night. This year also marks the 50th anniversary of the first FLIR, developed in 1963. The first FLIR produced little more than “blobs” on a display, but those blobs represented heat emitting targets, invisible to the eye but unmistakable as potential threats.

Developed with the U.S. Army, 2GF systems were born out of lessons learned from Desert Shield and Desert Storm and delivered the night-fighting capabilities that proved decisive in the liberation of Kuwait and the War on Terror. The second-generation FLIR (2GF) delivers twice the combat identification range and resolution of its first generation, which was already a step-function improvement over the custom FLIRs of the 1960s. Despite smoke, sandstorms, fog and obscuring fires, 2GF operates in the harshest weather conditions, providing crystal clear images.

In 1993, the U.S. Army officially established a 2GF Horizontal Technology Integration (HTI) special task force. Not only was it important to have cost-effective FLIRs, but HTI provided a “common view” across the battlefield. Armor, infantry, and air assets all shared in the benefits of having this common capability, production, support, and sustainment, significantly driving down costs. Similarly, HTI delivered a solution that could be provided to our allies, giving them these same advantages, and also provided the basis to begin to address another common request of our soldiers: a networked common operational picture, allowing any ally to see anything when and as they need it.

Our potential adversaries have not stood still in the development of their night-fighting capabilities. Today, our forces face the possibility of not having a strategic advantage in an ability to see and fight at night. The performance of competitive systems has or is beginning to equal that fielded by our forces.

To counter this trend, Raytheon has developed the third-generation of FLIR (3GF) with the U.S. Army. This next generation will regain battlefield night-fighting dominance. And, it will provide our forces with a true HD solution. This latest Third Generation system maintains the same narrow and wide fields-of-view as 2GF, while adding ultra-narrow- and ultra-wide fields-of-view. It operates in two infrared bands simultaneously and provides significantly higher resolution and magnification, resulting in longer range performance.

3GF is a digital system able to support cross battlefield sharing of the common operational picture, and it maintains the HTI focus on affordability through commonality across multiple platforms, reduced maintenance cost compared to 2GF, and performance to support the Army goal of reducing force size without losing capability. By initiating programs to move towards fielding, the Army is showing full support of 3GF.

More info: raytheon.com
General Paul J. Selva is Commander, Air Mobility Command, Scott Air Force Base, IL. Air Mobility Command’s mission is to provide rapid global mobility and sustainment for America’s armed forces. The command also plays a crucial role in providing humanitarian support at home and around the world. The men and women of AMC—active duty, Air National Guard, Air Force Reserve and civilians—provide airlift, aerial refueling, special air mission and aeromedical evacuation.

General Selva is a command pilot with more than 3,100 hours in the C-5, C-17A, C-141B, KC-10, KC-135A, and T-37.

Gen Paul J. Selva was interviewed by A&M Editor Kevin Hunter.

A&M: Please discuss your role as Commander, Air Mobility Command (AMC).

Gen. Selva: AMC has nearly 133,000 active duty, Air National Guard, Air Force Reserve, and DoD civilians who do extraordinary things daily. Anywhere around the world, Mobility Airmen provide crucial airlift, aerial refueling, special air mission, and aeromedical evacuation. As the air component to U.S. Transportation Command, I ensure AMC provides air mobility forces to support USTRANSCOM in their role as the single manager for transportation and patient movement. It is my job to ensure Mobility Airmen have the training, resources, and leadership needed to perform the hard jobs we’re expected to do. We accomplish this mission while maintaining a professional work environment and treating one another with mutual respect.

A&M: Please talk about AMC’s mission and role as part of the Air Force and greater DoD community.

Gen. Selva: AMC puts the “global” in the Air Force’s Global Vigilance, Global Reach, and Global Power. AMC’s mission is to provide global air mobility: the right effects, at the right place, at the right time for both contingency and humanitarian operations. For example, AMC delivered more than 1,400 passengers, 2,400 tons of cargo, and more than three million pounds of fuel to support French forces during operations in Mali this year. Last fall AMC flew nearly 1,000 flying hours to move more than 760 passengers and more than 3,500 tons of cargo to support Hurricane Sandy relief in the U.S. Simultaneously, AMC continuously supports Operation Enduring Freedom in Afghanistan.

A&M: From an equipment perspective, how is AMC working to promote life-cycle sustainment initiatives in support of present and future force requirements?

Gen. Selva: We’re doing several things in this area. The KC-46A is the Air Force’s No.1 acquisition priority. It will replace the 1950s-era KC-135 Stratotanker and will meet future mission requirements with more refueling capacity, improved efficiency, and more capability for cargo and aeromedical evacuation.

The C-5M Super Galaxy modernizes a 40-plus-year-old legacy C-5 aircraft to carry more cargo while using less fuel. The C-5M has gone through more than 70 upgrades, giving it a more powerful engine with 22 percent more thrust. The C-5M proved its worth carrying cargo on a non-stop 14-hour-plus flight to Afghanistan in 2011—the first direct delivery airlift mission through the Arctic Circle to Afghanistan.

On its way back, the same C-5M was loaded with retrograde cargo from Kyrgyzstan, Southwest Asia, and Western Europe to be returned to the U.S.—making efficient use of nearly all the 245,000 pounds of cargo capacity in the plane.

In terms of intratheater airlift, the Air Force made a tough decision to divest the C-27J and fill in that important mission with C-130s. The fiscal year 2013 President’s Budget submission reduces Air Force intratheater airlift force structure to a level meeting the needs of the National Defense Strategy within the constraints of the 2011 Budget Control Act. Although the FY 2013 NDAA directed the Air Force to retain an intratheater airlift aircraft floor of 358 only in FY 2013, the Air Force elected to extend the aircraft floor through fiscal year 2014. This voluntary extension affords the Air Force and stakeholders time to complete additional studies, redress force structure needs and allow for resolution of sequestration before the Air Force reassesses its force structure during the 2015 budget cycle.
We have fostered an atmosphere encouraging saving energy in everything we do, from ground ops to the flightline to flights.

A&M: AMC is the DoD’s largest consumer of fuel. How does AMC plan to reduce the use of fuel?

Gen. Selva: In the past, we have always been effective supporting the warfighter, but not always efficient. AMC is now dedicated to fuel efficiency and has developed new concepts to reduce costs to the taxpayer, considering fuel expenses consume a large part of our budget. An AMC aircraft takes off every 2.5 minutes somewhere on the globe every day of the year. Because we consume so much fuel, small improvements in efficiency result in large cost savings. One example is the use of electronic flight bags, which saves about $5.7 million annually in fuel, printing, and distribution costs.

Our simulators have transformed from black-and-white paper airplane-style graphics to a high-definition interactive capability. This provides a great opportunity for airmen to maintain qualifications while saving the Air Force fuel and money. Our long-term goal is to only fly operational missions in the aircraft, with all training conducted in cost-saving simulators.

Our Theater Express initiative will save $342 million this year. Theater Express is a program in which commercial airlift carriers can bid to transport military cargo on a price-per-pound basis. By using more robust software tools, the Air Mobility Division team in theater can now more accurately compare commercial bids against the cost of military airlift and then choose the most cost-effective mode of transportation. Accurate estimates of military airlift costs allow the AMD to increase the amount of cargo transported by regularly scheduled military aircraft. The huge savings in the program has freed up resources for other high-priority wartime requirements, including repairs to a damaged C-17 and C-17 Contractor Logistics Support costs.

We also conserve fuel through scheduled maintenance. In our KC-10 fleet we use an innovative approach to clean the engines, giving us 1.5 percent of fuel savings. While 1.5 percent might not sound big, multiply that against 59 jets that burn roughly 56,000 gallons of fuel crossing the Atlantic and that quickly adds up. The non-abrasive cleaning process uses a coal-based powder to clean the aluminum coating of the engines and blades to create better airflow. Since the tankers are cleaned once every two years, Air Mobility Command averages the fuel savings to 1 percent per year, which saves $2 million in fuel annually.

But our most important fuel-saving effort is through the culture change we are instituting.

A&M: What are some of the key challenges you see facing AMC looking ahead with Air Force and DoD requirements for air mobility?

Gen. Selva: The three biggest challenges AMC is facing are navigating the impacts of sequestration, training, and the resilience of our Mobility Airmen.

Sequestration is not just a problem we’re facing right now; this is a 10-year issue. The actions we are implementing due to sequestration have to be enduring. For example, flying-hour reductions, training to minimum standards, and well travel restrictions—all of which carry risk—will likely continue well into the future. In addition, starting July 8, AMC civilians were furloughed one day a week for six weeks. As we implemented the furlough, my main priority was to minimize the effect of furloughs on the mission and to continue to support our civilian workforce, which is key to the success of our mission.

As a result of sequestration, training becomes another challenge. We must continue to be a ready force. I’m asking Mobility Airmen to use the resources we currently have to find innovative ways to accomplish training—such as simulators, which are expected to reduce tanker-training hours by 10 percent and allow our pilots to maintain proficiency and readiness. The Chief of Staff of the Air Force said we are the smallest force in Air Force history. The Air Force used a balanced approach to adjust force structure while retaining the capacity to execute strategic guidance—with increased risk—and a commitment to maintain force readiness.

Another way to combat the challenge of training during sequestration is through the numerous successful virtual conferences AMC has held. Many of these have been traditional face-to-face sessions, and we would not have considered them if we had not incurred severe travel limitations due to sequestration. We’ve had a huge increase in participation (as anyone could dial in and contribute) and have gained tremendous praise from those who participated. We have saved $614,000 and estimate saving $1.2 million by end of the fiscal year. In this case, instead of canceling two linchpin conferences—one for wing commanders and one for select enlisted airmen and company-grade officers—normally held at Scott Air Force Base, IL, we took advantage of Defense Connect Online to hold virtual conferences. DCO and other virtual programs enable AMC to hold gatherings such as High Flight, Phoenix Stripe, and commander Rally conferences with fewer expenses. As many as 225 High Flight and Phoenix Stripe attendees and 300 Rally attendees participated this year from their desks instead of flying to Scott. In addition, instead of everyone sitting in a conference room listening to a briefer, now there can be multiple collaborative discussions at once. To expand on this, we created a chief learning officer position to increase the learning value while reducing associated costs. We want to create a culture of self-directed, lifelong learners and an adaptable, collaborative organization.

We will also continue to embrace the Total Force construct as the most efficient way to maintain our effectiveness. We must organize around structures we recognize. The important criterion is that we have access to aircraft with sufficient crew forces to meet combatant commander requirements. Who owns the aircraft shouldn’t matter—active or Reserve component. I’m proud to say AMC has a long total force tradition, dating back to 1968 with C-141s at Norton Air Force Base, CA, and we continue to lead the Air Force in Total Force efforts and teamwork. We’ll keep investing in the Total Force in the future with our KC-46 refueler and look for other ways to leverage the Total Force.
When a combatant command, such as U.S. Central Command, identifies the type of support they need, U.S. Transportation Command officials validate that requirement and decide whether that support will move by land, sea, air, or a combination of the three. If they decide to move the requirement by air, 618th Air and Space Operations Center, Tanker Airlift Control Center, U.S. Air Mobility Command, Scott AFB, IL, gets the call.

From Requirement ID to Mission Objective

Once the TACC receives a requirement from USTC, it goes into one of three planning directorates, depending on the type of mission: the Global Channel Operations Directorate, responsible for passenger and cargo movement in the Defense Transportation System; the Current Operations Directorate, responsible for commercial airlift and air refueling missions to meet customer requirements; and the Global Readiness Directorate, which plans missions for contingencies, aeromedical evacuation, exercises, and humanitarian efforts.

Once a mission is planned by one of the three directorates, it moves on to the Mobility Management Directorate, where the planned mission is tasked to an active duty unit or available air reserve component unit. Finally, once the mission is planned by one of the planning directorates, and a crew and aircraft are allocated to fly the mission by the Mobility Management Directorate, it moves to the Command and Control Directorate, who obtain diplomatic clearances, create flight plan packages, and execute the missions from the TACC’s Operations Floor.

All actions on the operations floor are overseen by an experienced aircrew member holding the rank of colonel. That person, a member of the Director of Operations Directorate referred to as the “senior,” is the single point of contact for Air Mobility Command (AMC)’s mission execution, serving as the command’s representative to the joint staff, Air Force Watch Cell, National Military Command Center, U.S. Transportation Command, the DoD, and other agencies.

The TACC continues to work with partners to provide the best service to fulfill the mission needs while using the best methods available. An example of this would be the Mobility Air Forces Cost Avoidance Tankering. Members of the TACC track and plan routes and examine methods of movement to cut down on fuel cost. In short, cost of fuel at down-range locations is weighed against the cost of weight to carry extra fuel, mission requirements, and other mission restrictions resulted in the decision to carry extra or refuel down-range. By doing this, AMC avoided more than $78 million in fuel costs in the first six months of implementation and has been securing more than $13 million per month in cost avoidance as the program matured.

There are two other directorates apart from the TACC that have a significant impact on operations throughout the mission planning and execution process: the Mission Support Directorate, which provides data, technology, and resource support across the TACC; and the Global Mobility Weather Operations Directorate, which provides weather products, services, and briefings for mission planning and execution phases managed by the TACC for strategic airlift- and air-refueling crews operating worldwide.

The 618 AOC (TACC)’s Global Impact

The missions planned and executed by the TACC provide a variety of global impacts and are often conducted simultaneously. One mission could be supporting humanitarian operations while a completely different mission could be delivering supplies to warfighters.

When Japan was struck with an 8.9-magnitude earthquake and subsequent tsunami 11 March 2011, the world answered the call with an unprecedented response—and so did mobility and contingency airmen. The TACC was quick to respond, immediately planning missions to Japan. Within the first 24 hours following the disaster, three C-17 Globemaster III missions were launched. The first aircraft, operated by the 62nd Airlift Wing departed March 12, 2011, carrying more than 30 tons of cargo. The second aircraft departed less than 30 minutes later from Joint Base Charleston, S.C.

AMC aircraft alone flew 127 sorties, carried 6,213 passengers and transported 816 tons of cargo on the airlift side, according to TACC statistics. In air refueling sorties, AMC tankers off-loaded 489,300 pounds of fuel to aircraft making their way to Japan with relief supplies.

One of many examples of our support to the warfighter is the return of equipment and troops on the ground in Afghanistan. In mid-2011, President Barack Obama made the withdrawal of deployed troops from Afghanistan a DoD priority. This mission is still occurring today and being carried out within the TACC.

While providing direct support to warfighting operations is a standard for the TACC, at a moment’s notice the organization can adjust to meet the needs of the current circumstances affecting the world.

The TACC’s mission doesn’t end with cargo transport or humanitarian relief. It also includes transporting soldiers, sailors, airmen, and Marines around the world, extending the global reach of U.S. and coalition aircraft via air-to-air refueling, and moving injured troops or civilians to medical centers.

One such case occurred last May, when the TACC coordinated an aeromedical evacuation mission for a ill contractor with the National Science Foundation from McMurdo Station, Antarctica.

The validated requirement to move the patient came into the TACC, and the aeromedical evacuation cell immediately got to work coordinating with other TACC personnel to obtain the flight plans, diplomatic clearances, and other items necessary to plan the mission. One key aspect to this movement was the aircraft had to be equipped with the right assets. The crew was able to safely evacuate the patient to Christchurch within 66 hours of departing Joint Base Lewis-McChord, WA. Thanks to the fast and professional work of all parties involved, the crew was also able to deliver 40,000 pounds of cargo and supplies and six passengers, all in total darkness and minus 32 degrees Celsius.

More info: www.618tacc.amc.af.mil

More info: www.618tacc.amc.af.mil
SPEARHEADING
EQUIPMENT REJUVENATION

In the high desert plains of Northern California, the Army has been working efficiently and quietly to maximize the life of its equipment coming back from overseas.

By Lori McDonald, Public Affairs/Protocol Officer, Sierra Army Depot

Established in 1942, Sierra Ordnance Depot, located in the foothills of the Sierra-Nevada Mountains, became the designated home for the storage of war reserve supplies and inert materials but expanded to include the of receipt, storage, and issue of all classes of ammunition and explosives, except chemical ammunition.

The Depot’s mission evolved as a result of new Army requirements and recommendations from the 1995 and 2005 Base Realignment and Closure (BRAC) Commissions. Today, Sierra Army Depot (SIAD) is no longer a storage and handling site for ammunition—it is a more than 36,000-acre depot that provides rapid expeditionary logistics support and long-term sustainment solutions to the Army and the Joint Force.

SIAD, a member of the TACOM Life Cycle Management Command, is a joint strategic power projection platform providing a wide variety of long-term, life-cycle sustainment solutions for the Joint Services, from equipment receipt and asset visibility to repair/reset of all Army fuel and water systems and on-demand rapid deployment from the organic airfield. These unique operations provide readiness and operational value to both the Army and the nation through management and controlled redistribution of equipment to meet support deploying soldiers.

End of First Life Center

One of the first things people hear about SIAD is the vast number of tanks and equipment stored there. In fiscal year 2005, the Army needed a site that had the resources to accommodate equipment in excess of its needs. Sierra did not hesitate to accept that mission.

SIAD has the space and transportation capability to support the receipt and distribution of equipment awaiting induction into reset/repair programs, Foreign Military Sale programs, or Defense Logistic Disposition Services actions. It continues to make infrastructure improvements to support this growing requirement.

“We should capitalize on this initial effort by formalizing and expanding the effort in much the same way the Air Force did with their Aerospace Maintenance and Regeneration Group operation at Davis-Monthan AFB in Arizona,” Mr. Donald C. Olson, SIAD deputy to the commander, said “Designated by the [Secretary of Defense] in 1964 as a consolidation point for the storage, disposal, and reclamation of aircraft and aircraft components, we believe this model, adapted to ground equipment at SIAD, is a good fit for the Army now and into the foreseeable future.”

The Depot manages what is now called an End of First Life Center for the storage, accountability, parts reclamation and distribution of more than 21,000 pieces of equipment and Major end items.

“The Army’s decision to send excess combat vehicles to Sierra has reaped benefits far greater than originally estimated,” Olson said. “We have just scratched the surface on potential cost savings and readiness impacts.”

Retrograde and Redistribution

One of the greatest services Sierra has to offer is the ability to quickly establish processes in order to meet the needs of the Army. In 2004, Sierra was tagged as the site for the Southwest Asia (SWA) Reverse Pipeline Operation. This was no small job: The Army was looking for a site to ship and store excess assets from units that were returning to the states. We do this and much more.

Currently, the Depot operates the Army’s largest Standard Army Retail Supply System (SARSS) Supply Support Activity (SSA) operation focused solely on the receipt, processing, and redistribution of previously issued stock back into the system. The overarching goal of these redistribution efforts are to receive excess “dirty” stock and manage that stock in order to realize some positive value directly back to the Army. Since the start of this program in 2004, the cost avoidance to the Army Working Capital Fund (AWCF) is more than $510 million.

Excess stock returning from SWA along with OCONUS and CONUS posts, camps, and stations arrives at Sierra in bulk shipments or containers via rail or ground transportation. Once a shipment is

The overarching goal of these redistribution efforts are to receive excess “dirty” stock and manage that stock in order to realize some positive value directly back to the Army.
opened, the assets are identified, separated, and run down individual production lines where each item is thoroughly checked for the five key elements: Nomenclature, Unit Issue, Condition Code, Quantity, and NSN, then processed into SARSS for the R&R equipment, Property Book Unit Supply Enhanced (P-BUSE) for the Non Standard Equipment (NS-E), and Central Issuing Facility (CIF) for the Organizational Clothing and Individual Equipment (OCIE) material where appropriate. As this effort has grown, we have seen that the more material the Army sends to Sierra, the more material Sierra redistribute to units worldwide.

Due to the successes with the SWA Reverse Pipeline mission, Sierra has been designated as the Army’s main consolidation and (re) distribution center for the Clothing Management Office (CMO) to perform Brigade-level OCIE reset Operations. SIAD performs similar functions on clothing to receive, identify, classify, and bring to record “excess” OCIE from Clothing and Issue Facilities (CIFs); returned items from SWA (and posts/camps/stations); and new OCIE directly from DLA. Since this program has been so successful, the Army made the decision to expand Sierra’s OCIE mission to support the Army Reserve units as well.

As part of the OCIE program, Sierra has over 1.7 million Enhanced Small Arms Protective Insert (ESAPI) and Enhanced Side Ballistic Insert (ESBI) plates on hand—over two-thirds of them were deemed “unserviceable” due to external material failures. Sierra worked with the CMO to establish a repair capability at Sierra, to “patch” these plates, and return them to inventory as serviceable assets, at a cost of approximately $16 each. The cost for the Army to buy a new plate is approximately $550 apiece. To date over 1.72 million plates have been x-rayed at Sierra and made available for issue to CIF’s all around the world.

**Petroleum and Water Systems**

In 2011, SIAD was designated by the Secretary of the Army as the Center for Industrial Technical Excellence (CITE) for all petroleum and water distribution systems for the Army. Having a CITE designation greatly enhances the Depot’s ability to enter into partnership agreements.

So what exactly is being performed at Sierra on these systems? When assets arrive at Sierra, they are first inspected to determine if they are serviceable. If so, then minor maintenance or new replacement parts are procured to bring the equipment to original state or upgraded with incorporated changes, modifications, and enhancements. These assets are then reassigned or transported to the appropriate unit in the field.

There are two fuel systems managed at Sierra, Fuel System Supply Point (FSSP) and the Inland Petroleum Distribution System (IPDS). Think of the FSSP as the gas station and the IPDS as the pipeline: The Depot assembles each system to include collapsible fabric tanks, pumps, filters/separators, hoses, valves, and so on down to the couplings and fittings and then ensures each of these systems arrive at the deployed units in a ready-for-use condition.

**Add-on Armor Mission**

Sierra’s containerization and assembly mission saw a major increase in workload requirements, in addition to their current expertise in the Reset and Assembly of Water and Fuel systems. They established a receipt, warehousing, refurbishing, and kitting operation in direct support of the reset of add-on armor programs for Striker kits, High Mobility Multipurpose Wheeled Vehicles (HMMWV), and Tactical Urban Survivability kits. Red River Army Depot removes the components of the add-on armor during the vehicle reset. These components are palletized, sent to SIAD where they are inspected, classified, and placed on record prior to refurbishing and kitting.

During FY12, Sierra’s production engineers worked closely with the Product Manager for these kits and developed standardized configurations, bills of materials, customized crates, and special packaging instructions. Detailed analysis is performed on available components, and the engineers determine what is needed to complete each of the various kit configurations to meet customer requested production schedules. Items are then earmarked for repair or refurbishment and, in those instances where no product is available, procured. Material is then released to the production floor kitting operations. In order to handle the heavy component pieces, special material handling equipment and roller systems were installed.

**Continuous Process Improvements**

Lean Six Sigma was first introduced to employees of Sierra Army Depot in 2003. The fundamental goal is to provide value to customers by reduction of waste and streamlining processes. An example of “waste” would be unnecessary movement or motion, over production, over processing, excessive transportation, and preventable accidents. SIAD has completed over 170 process improvement initiatives, with validated financial benefits in excess of $32 million since the inception of our program.

In spite of the challenges of financial uncertainties and constant transition in the Army, the Lean processes enable Sierra to remain forward thinking in our efforts to overcome and adapt to change, creating better value for our customers.

Value engineering is another tool for Process Improvement that Sierra utilizes. This process is a systematic method for improving the “value” of products by using functional analysis. As an example, mechanics at SIAD developed an electrical test cell for a water purification system reset program to ensure proper functionality instead of simply replacing it, saving the program over $3 million over a three-year period.

**Adapting for the Soldier**

SIAD’s mission has changed through the years but the workforce has always been willing and able to adapt to the transitioning needs of the soldiers. Whether they are working production lines, clearing land for more open storage, or working in an office, employees at Sierra Army Depot take great pride to ensure the soldier in the field has the necessary equipment to accomplish their mission.

More info: sierra.army.mil
## Calendar of Events

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