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Commander discusses changes at RDECOM

The U.S. Army Research, Development and Engineering Command held a transformation ceremony on Oct. 9, at Aberdeen Proving Ground, Md. During that ceremony, the colors for the U.S. Army Soldier and Biological Chemical Command were cased, and the colors were unfurled not only for RDECOM, but also the Chemical Materials Agency, which is responsible for storage and destruction of the nation's chemical weapons stockpile, and the Guardian Brigade, which incorporates the U.S. Army Technical Escort Unit.

RDECOM still is considered provisional, until the organization's concept plan is signed. However, the command is moving forward in its mission of putting the right technology into the hands of our Soldiers as quickly as possible.

Maj. Gen. John C. Doesburg, Commander of RDECOM, discussed the organization's mission, challenges and vision during an interview Oct. 27.

What did the transformation ceremony mean for the command?

Even though we're in a command that works on the leading edge of technology, like the Army, we're still tradition based. One of the traditions in the Army is the formal ceremony, which unfurls the flag of the new organization, and furls the flags of older organizations. The transformation ceremony brought finality to the former Soldier and Biological Chemical Command and brought recognition to the new Research, Development and Engineering Command, Chemical Materials Agency and Guardian Brigade. During that formal ceremony, we stood down one organization and stood up three.

I think where it has the biggest impact is on people. During times of change, the symbol of that change may not be there. A parade, a formation, flags, speeches, bring finality to that symbolism. People can see it, touch it, feel it and know that it's happened. A sense of belonging is important. The 9th of Oct will stick in a lot of people's minds because they were there, and they knew on that day, the RDECOM stood up.

RDECOM now has more than 14,000 civilian employees, located at research, development and engineering centers and offices around the world. What do you want all the employees who are new to RDECOM to know about the new organization?

I think the biggest thing is that no organization, no individual, is going it alone. You might be the principal investigator in a particular area, and you may feel you're the only one working in that area. But in today's environment, you have the power of roughly 14,000 people that you can call on when you've reached that wall, that impenetrable point in your research or the work you're doing. There are literally 14,000 people out there, scientists and engineers and technicians, folks who may not be as expert as you are in your area, but may have that key piece of information or have done that key bit of work to enable you to rise over that hurdle, to bring that technology to closure but more importantly, speed up the process and put it in the hands of Soldiers.

The Soldier is the ultimate customer for all this technology. How will the changes at RDECOM affect the Soldier?

We at RDECOM clearly recognize that the most precise weapon on the battlefield is the Soldier. No matter what type of technology there is, it has to support that weapon's platform, that weapon's system, the individual Soldier. Whether it's the Future Combat System, whether it's the next individual weapon or the next crew-served weapon, or the next means of transport for that Soldier, or computer capability to provide situational awareness, all of that is supporting that most



Major General John C. Doesburg
Commander, RDECOM

precise weapon, the Soldier. That's really what we're committed to when you think of our mission of putting technology into the hands of Soldiers as quickly as possible.

The time to get new and improved technology to the battlefield as been dramatically decreased. How far do you think it can go?

Don't be surprised if some of the future technology is instantaneous. Some of the significant systems we field today require software to operate. It's not that far in the future where a crew can do instantaneous software upgrades. For example, as you're sitting with your heads-up display, scanning the battlefield for your next target, the upper right hand corner of the display says, "Version 2.0 has been uploaded." You now have the capability to see an additional four kilometers. That's not out of the realm of possibility in the not-too-distant future.

How have you seen the faster deployment of technology work during Operation Iraqi Freedom and Operation Enduring Freedom?

A lot of that technology is rolling over into the Stryker Brigade that's going to be deploying, which is one of the major things you can look at. The M1 tank, Humvee doors, Stryker Brigade's use of bar armor, all of those are big things. But there are even bigger things out there. The work done by Aviation and Missile Research, Development and Engineering Center supporting Predator with Hellfire, provides the ability to be able to fire from an unmanned platform. That work was done at AMRDEC's Prototype Integration Facility. Blue Force Tracking is being put into helicopters, so they can in fact see the forces on the ground. That work is ongoing. You can go from very large projects, to very small ones literally across the battlefield. A lot of technology has been integrated, and it's been fascinating. The last list of technology updates that I looked at was five pages long. Some are very small, but very influential in the way we do business in the field. There are still issues out there that we haven't addressed, some of we know about, some of them we don't know about, but as we discover those with our FAST teams that are over in Iraq, we're trying to very quickly bring them in and look for the technological solution.

In the past, you've described the Agile Development Center, as the "skunk works" where you can bring together the right people from across the organization to solve problems. How is that working in reality?

Our only difficulty is that we developed the Agile Development Center to work on the future, but because of the war in Iraq, the war in Afghanistan, the support operations in Bosnia and Kosovo, and because of support operations literally throughout the world, we've found that more and more the Agile Development Center is working on current problems. We're not always looking for technology from some distant future. Instead, we're taking tomorrow's technology and bringing it forward, to solve immediate problems that we have in the fighting force.

The power to be able to reach across all of those research, development and engineering centers, literally, and grabbing hold of the best and the brightest, and asking them to think their way through the problem, and having the capability to prototype and test it very quickly, and put it in the hands of the Soldiers very quickly. Quite frankly, the great success of the Agile Development Center is the intellectual power of the people. You can model it and look at it very hard, but at the end of the day, you really do need that intellectual power of humans together to look at it and solve this problem. Of course, they are augmented by computers and databases, but intuitively they are thinking their way through the problem. Take what they think of, model it, design it, build it, test it and field it and put it in the hands of Soldiers.

The Agile Development Center doesn't work on its own. Just because they've been able to think their way through the problem and build a prototype, if they aren't directly linked to the PEOs and PMs, if they aren't directly linked to the manufacturing side of what we do, who cares if you have a great idea and a great solution? Scientists with great ideas need to have that final piece, the fielding piece, and that needs to be done by the folks who do that best, the PMs and the PEOs. It's not an ivory tower, where you say "I've got the solution to your problem and I'm going to give it to you, and I don't care who else has got another idea."

How do you communicate with such a geographically diverse work force?

It really starts at the top, in all of those organizations. It's the reason that the Board of Directors is so important. The Board of Directors has to be a team. All of the directors have to believe in the vision, the mission and the goals of the organization and the operating concepts that we're going to use. That's what we worked on the most at the beginning of establishing the organization – making the Board of Directors a team. If you have them committed to the team, to that vision, mission and goals, then their organizations become committed.

What shows this the best is in the executive session on Monday mornings. They're virtual and collaborative, done by video teleconferencing, roughly 11 sites, all wired in and we discuss the issues that we have that week, and what we're working on. It originally started as just the director and maybe one other individual that sat in. Now, it's not uncommon that I'm looking into a conference room with as many as 12 people in the room, because each one of them knows they might be talking to an organization that has a part to play in the success of their technology or weapons system. They need to be part of that. They need to hear what I'm saying, and they need to hear what other people are saying, so they can do what they need to do in the systems of systems approach.

Another way you do it is with town hall meetings, when I have the opportunity to tell the work force what their directors have heard from me, but now they get to hear it straight from me. I just did one at AMRDEC in Huntsville, and when I visit each one of the sites, I try and do a town hall meeting while I'm there. What's interesting is that at all of the sites, it's very similar to here at Edgewood. At AMRDEC, even though I had a fairly large-sized crowd in the auditorium, it was being broadcast, so they could see it on television and by VTC. People didn't have to be there to hear the town hall meeting. Just like I do my executive sessions, virtually and collaboratively, the same thing is occurs in the town hall meetings. Questions are coming in by telephone, on the computer, and some are even hand-written. Others are voicing them in person.

What theme do you try to get across at these meetings?

It's important to have a consistent theme and a consistent focus. You don't change it. Our consistent theme and the consistent focus is that we are working on a system of systems approach. We don't field that individual widget. We field a system of systems. That widget might be the most critical thing there, it might in fact be the pacing item for that system of systems, but you have to be concerned about all of the widgets that make the system so they all come together at the right time, at the right place, to solve the problem. That's the reason the Deputy Commanding General of Systems of Systems Integration, Brig. Gen. Charles Cartwright, is so important. He's the one who tracks all of the parts, all of the widgets, all of the technology coming together at the same time to solve that system of systems problem.

The plan was for the Deputy Commanding General, the Board of Directors and the capability managers to be the core of the RDECOM leadership. How has this come together in reality?

It's actually come together quite well. Our Board of Directors runs the organization, which consists of all the directors, myself, my deputy and the chief of staff. But it also includes not as voting members, but as members who can attend, all of our partners, the labs, Special Operations Command, the other services, the U.S. Army Test and Evaluation Command, and the U.S. Army Training and Doctrine Command. They all have an opportunity to sit in our Board of Directors meetings, along with our quarterly reviews, and to contribute to how we do business, and to be our critics when we aren't doing what's necessary for the Army.

Our capability managers and technology integrators have really become our Integrated Processing Teams, the IPTs. Our ability to now pull together across all of the research, development and engineering centers the necessary expertise and capabilities to roadmap what we need to do both for today and in the future. We've changed some of the terms. We don't talk as much about capability managers and technology integrators as we do our IPTs: our Lethality IPT, our Survivability IPT, our Countermine IPT, our Power and Energy IPT – and the road-mapping process to understand where these impact not just our equipment, but where it impacts the individual Soldier, where it impacts the smallest systems that we have out there, and how do we draw that thread across all of those so that we don't develop 10 different types of fuel systems and 15 different types of batteries. We look for the commonality of technology to decrease the sustainment requirement for the fighting force.

So our plans have changed, but the changes in the plans are not dramatic changes in the plans. By and large, what we set out to do, we're doing. We may have changed names, and may have changed a couple of degrees to the left or right on how we do it, but that's part of the growing process in any organization.

Are we ever going to get an organization chart?

It's an interesting question, and I'll give you my philosophical reason for why I don't believe in organization charts. For the first three years at SBCCOM, the organization chart consisted of three circles, Research, Development and Acquisition Enterprise, Operations Enterprise, and Command Group Enterprise. Everybody senior to me said, "No, I want an organization chart." I said, "That is it." They said, "Well, there are no names on it." I said, "Names are not important."

The reason for that is that once you have a box, and your name is in a box, everyone likes to look at that box and say, "That's my box, and that's what I do. My box has a name and so I do what's in the box." What you'd rather have is an individual who says, "In this organization, I work on research and development. I work on science and technology. I work on engineering and sustainment." There are no limits to that. When an issue or problem comes up, you want to be an individual who's there to solve that problem. Or if something new and innovative is seen in technology, you want to be one of the individuals working on it. I really dislike boxes. But in fact we do have a wiring diagram, because the Army really wants those wiring diagrams, and the chief of staff has finalized that. It's not down to each and every individual, it's at a more macro level.

Were there any surprises during the stand-up process?

The one thing that surprised me was the difficulty in getting the concept plan approved. We were well on the mark in getting it submitted far enough in advance to have it approved. What I hadn't counted on was the amount of transformation change going on in the Army, which meant the process was not as it had been in the past, when I was responsible for the stand-up of SBCCOM. As a consequence, the concept plan has taken a lot longer to get approved than I had anticipated. That hasn't stopped us from still moving forward. We're an operating organization. But as everyone says, the job's not done until the paperwork's completed, and that's my major piece of paperwork that's sitting out there, that hasn't had its final signature.

Transformation ceremony marks new beginning for RDECOM

By Karen Jolley Drewen, RDECOM Public Affairs Office

ABERDEEN PROVING GROUND, Md. – Hundreds of spectators watched silently as the colors of the U.S. Army Soldier and Biological Chemical Command were cased Oct. 9 in a ceremony that signaled the end of one era and the beginning of a new one.

That ceremony also marked the stand-up for the U.S. Army Research, Development and Engineering Command (Provisional), the Chemical Materials Agency (Provisional) and the Guardian Brigade, three new organizations that mark another milestone in the transformation of the U.S. Army Materiel Command and the U.S. Army.

RDECOM and CMA were organized as new organizations as of Oct. 9, although both still are provisional organizations. The Guardian Brigade's effective date is Oct. 15.

General Paul J. Kern, AMC commander, noted that these changes are particularly meaningful as the United States faces change and is "at war with an element of terrorists who seek to undermine the USA."

"We are celebrating the transformation of three organizations all designed to keep our Army relevant," Kern said. "Each has been created to face this changing world."

He said Army laboratories and research and engineering centers "have provided soldiers with technological superiority for the last century, a remarkable period of history in which more has happened than in the thousands of years prior."

Kern recognized the contributions of Major General John C. Doesburg, commander of SBCCOM, and now RDECOM, and Brigadier General Charles Cartwright, deputy commanding general for RDECOM's System of Systems Integration, for having the vision to create an organization that will exploit technological advances in research activities around the world, and ultimately put new technology into the hands of soldiers faster.

SBCCOM and its predecessor organizations leave behind a history that began in 1917. The Chemical Warfare Service was established at Edgewood Arsenal to meet World War I efforts, and after the war continued its mission of chemical research, development and training.

Name changes over the years included the Chemical Warfare Center, Army Chemical Center, Chemical Systems Laboratory, Chemical Research and Development Center, Chemical Research, Development and Engineering Center, Chemical Biological Defense Agency, Chemical and Biological Defense Command and finally SBCCOM, following a merger with Soldier Systems Command in 1998.

Doesburg joined Kern on the field to case the SBCCOM colors, with the assistance of RDECOM Command Sergeant Major James A. Barkley, and unfurl the RDECOM colors, represented for all three organizations by the Army flag.

"As we fold its colors today, we are creating the organizations to accelerate and close many of the efforts of this superb organization," Kern said of SBCCOM.



Major General John C. Doesburg, left, and Command Sergeant Major James A. Barkley case the colors of the U.S. Army Soldier and Biological Chemical Command as General Paul J. Kern, right, commander of the U.S. Army Materiel Command, looks on. A ceremony held Oct. 9 at Aberdeen Proving Ground, Md., marked an ending for SBCCOM and a beginning for the U.S. Army Research, Development and Engineering Command (Provisional), Chemical Materials Agency (Provisional), and the Guardian Brigade. Photo by Ralph Broth.

Michael A. Parker, acting director of CMA, then joined Kern on the field to unfurl the colors representing his new organization, which merges the chemical demilitarization effort, formerly under the Program Manager for Chemical Demilitarization, with storage of chemical weapons, formerly under the oversight of SBCCOM.

"The goal of this agency is to put itself out of business," Kern said, noting that the organization is urgently needed. Destruction of the aging chemical weapons stockpile has begun at three of the eight U.S. stockpile sites, including the Aberdeen Chemical Agent Disposal Facility in APG's Edgewood Area. ABCDF began operations in April, and will destroy the APG stockpile of mustard agent through neutralization.

Colonel Timothy Madere, acting commander of the Guardian Brigade, stepped onto the field to stand up his new organization, which will incorporate what formerly was the 60-year-old Technical Escort Unit. The new organization creates a full-spectrum, deployable, operational level command to manage Chemical, Biological, Radiological, Nuclear and High-Yield Explosive response assets, a "one-stop shop for defense of chemical and biological hazards."

"This is the starting point to create a full spectrum response to satisfy operational requirements in the event that our enemies resort to weapons of mass destruction," Kern said.

The 389th Army Band (AMC's Own) provided music for the ceremony, and the Ordnance Center and School Salute Battery offered a 16-gun salute. The Technical Escort Unit Color Guard supported the event.

"The creation of these three new organizations is part of the transformation of the Army," Kern said. "If all our transformation initiatives come together as smoothly as the three we celebrate here today, the Army's future will be very bright."



General Paul J. Kern, right, commander of the U.S. Army Materiel Command, and Command Sergeant Major James A. Barkley of the U.S. Army Research, Development and Engineering Command (Provisional) uncasing the colors as RDECOM Commander Major General John C. Doesburg, left, looks on. A ceremony held Oct. 9 at Aberdeen Proving Ground, Md., marked the beginning of RDECOM, Chemical Materials Agency (Provisional), and the Guardian Brigade, and the end of the U.S. Army Soldier and Biological Chemical Command. Photo by Ralph Broth.

CERDEC facility reacts quickly to warfighter needs

By Daphne Hart, CERDEC

FORT MONMOUTH, N.J. – It improves existing products, turns concepts into innovative devices and gets critical capabilities in the hands of the warfighter in as little as one week.

The Fabrication/Integration and Fielding Facility is at the forefront of quick readiness capability, the ability to take a concept and put it in a format that allows for rapid deployment anywhere in the world.

Located at the Communications – Electronics Research, Development and Engineering Center's Intelligence and Information Warfare Directorate, Fort Monmouth., FIFF projects range from small-scale development and modification to large-scale innovative deployable systems that require material fabrication, equipment upgrades, cable routing and construction.

"The FIFF's primary mission is to build prototype systems for customer risk reduction, field testing and deployment for users in the field," said Sgt. 1st Class Scott Cheseldine, the facility's non-commissioned officer-in-charge.

FIFF Branch Chief James Hillson added that on-site assistance to customers, including training, integration and maintenance support, is also offered. Another benefit is the staff's ability to make good systems better.

"We specialize in miniaturizing and upgrading existing systems in order to make the warfighter more effective," Hillson said, citing the Panda Generator as a product that was developed elsewhere but redesigned here for Soldier ease-of-use.

Among the more recognized systems that have been fielded through the FIFF's 6,000 square-foot bay are 32 Prophet vehicles with another 25 on the way. The facility also developed a "proof of concept" vehicle for Redstone Arsenal's Weapons Surveillance System, which detects "muzzle flash," the flash of light from a weapon's muzzle when fired.

Customers generally approach the facility with a system and platform in mind. After discussing requirements, including where the product will be used, how it will get there and how rugged it needs to be, FIFF personnel either concur or offer a new and more appropriate platform.

"Our experience with the FIFF has been very positive and we have been impressed with their ability to meet the challenges of complex and time sensitive tasks," said Robert Friend, integrated logistics support manager for the Trojan Program. "They have an exceptionally knowledgeable staff and their end product is topnotch."

Though the FIFF staff mainly supports organizations and product managers at Fort Monmouth, it assists any organization that requests their expertise, and have done so in Kuwait, Korea, Germany and at numerous locations within the continental United States.

"Our staff is deployable all over the world," Cheseldine said of the 17 full-time personnel and three contracting companies that the FIFF can call upon when needed.

"The contractor support gives us the ability to tap into other resources, such as computer aided design and level three drawings," Cheseldine explained, referring to detailed plans that allow the system to be taken apart and put back together. "Whatever our customer needs, we can provide it."



A Soldier installs a sensor on a "proof of concept" vehicle in the Fabrication/Integration and Fielding Facility's 6,000-square-foot bay. Photo by Gail Woodworth.

And they can provide it quickly. Hillson said that although they generally have up to 12 months to design and build appropriate platforms for each system, shorter deadlines are not uncommon.

Cheseldine agreed. "We had someone come to us with a system that needed to be sent to the Middle East for Operation Iraqi Freedom. We had it assembled and packed up in a week."

One reason the FIFF can meet such a short turnaround is that a variety of equipment is kept on hand, including Humvee shelters and antennas, which can be used if needed, Hillson said. That speed combined with the experience and professionalism of the FIFF's staff make it so invaluable to the Army.

"We have a proven track record for quality workmanship and quick reaction capabilities that simply cannot be duplicated elsewhere," Hillson added.

Anthony Lisuzzo, director of the Intelligence and Information Warfare Directorate, concurred.

"We know how to fabricate products of the highest caliber and we know how to do it quickly," Lisuzzo said. "The work of the FIFF is indicative of I2WD's mission to enhance combat effectiveness and, ultimately, save the lives of our Soldiers."

TARDEC develops programmable grenade launcher

By John J. Schmitz, Robert C. Washburn and David E. Brown, TARDEC

Recent world events have shown that the strength of our front line forces requires the enemy to look at the relatively softer supply lines to inflict casualties, disrupt operations and continue fighting. Proliferation of rocket propelled grenades makes supply vehicles vulnerable to surprise attack.

The U.S. tactical fleet requires the same hard and soft kill, and anti-personnel capabilities as the main battle tanks and armored personnel carriers. The Tank-automotive Research, Development and Engineering Center is developing an anti-Rocket-Propelled Grenade that uses the 66mm smoke grenade and launcher form factor.

Under development as a joint project between TARDEC and PM Obscuration is the XM8 Programmable Grenade Launcher. Based upon the widely fielded 66mm smoke grenade launcher, XM8 improves the obscurant system by digitizing the launcher and strengthening it to meet the needs of the Full Spectrum Active Protection Close-in Layered Shield anti-RPG grenade.

The XM8 can be fielded to existing armored personnel carriers, HMMWVs and other tactical trucks, and can be used in fixed locations like checkpoints and ammunition dumps. PGLs can be setup on the fly with smoke, anti-personnel and countermeasure grenades and operated from a simple control box or a networked computer. This gives the Soldier the choice to disperse an unruly crowd with smoke, or stop an assault force from breaching the perimeter with anti-personnel grenades, while maintaining an anti-RPG over-watch with FLCAS.

At the heart of the PGL is a microcontroller that includes a Controller Area Network bus, a Bosch-developed protocol used on almost every automobile built today as well as a growing list of military vehicles such as the HMMWV, Palletized Load System, and the Family of Medium Tactical Vehicles Load Handling System variants. The CAN bus allows many sensors and controllers to operate simultaneously on the same pair of wires, providing a fully integrated system that can talk to all systems on the bus. For instance, data from GPS sensors may be needed by a map screen on the dashboard as well as a fire control computer. With the CAN bus, that data is available to any system that needs it. On most cars, the engine controller, transmission controller, HVAC, dashboard controls and body controller use the CAN bus to communicate.

On the PGL system, the grenade launch tube was redesigned to handle the larger forces produced by the FLCAS, but allow for the standard smoke grenades currently fielded. The stainless steel tubes can withstand the 5000 to 6000 PSI forces produced by the grenades, and the stainless steel has excellent anti-corrosion properties required for a long life.

Embedded in the tube launcher is a micro controller board used to sense the status of each tube, determine the type of round loaded and provide remotely controlled firing of any and all tubes. Currently fielded grenade launchers have no such feature and all, except the M6, are "all or nothing" systems – one switch typically throws a salvo of grenades.

The PGL, designed to be more flexible, can be retrofitted to a vehicle with or without existing grenade tubes with a varied number and position of tubes. The type of grenades used can also be changed on the fly and easily programmed into the controller. The launch tube controller's job is to inform the main controller (or controllers) what tube is loaded and with what type of round. This information is provided to the user via a standalone control box or integrated battlefield computer. The operator can decide to "fire all smoke" tubes or to turn on the countermeasure system. In this scenario, the countermeasure system would stay powered and watch the area around it for incoming threats. Once detected, the



The Tank-automotive Research, Development and Engineering Center is developing an anti-Rocket-Propelled Grenade that uses the 66mm smoke grenade and launcher form factor.

countermeasure would fire itself and defeat the threat. At that point, the launch tube controller would notify the main controller that a round was fired and from which tube. This type of flexibility is essential for the modern battlefield.

Safety provisions include a feature to eliminate accidental firing. Many data transmissions on the CAN bus would be required before a launch tube would be allowed to power a tube or fire a round. Future improvements could include individually serial numbered grenades with integrated data on the type of grenade and its expiration date. This would allow individual grenades that may have misfired to be reported back to the manufacturer for evaluation.

The prototype PGL utilizes a 1-megabit per second data rate and can control hundreds of tubes. The system is easier on a vehicle's electrical system than other systems. Currently fielded smoke systems would fire all the grenades at exactly the same time causing a surge. Since the PGL is designed to control every tube individually, it can fire the rounds one at a time just a few milliseconds apart, reducing the surge current to half an amp while providing the fast action required. The CAN bus enabled system can provide features like motion sensing, enabling the controller to "safe" the countermeasure during a non-mobile scenario, like a checkpoint, when a foot patrol is going by and automatically "re-arm" when the area is clear of personnel.

The XM8 Programmable Grenade Launcher is designed to be flexible and user friendly while providing the cutting edge to our fighting forces. Current designs could be fielded in less than one year.

Full materiel release for premier artillery time fuze ready for deployment

By Maria A. Allende-Pastrana and Brenda I. Miranda

PICATINNY ARSENAL, N.J. – While the basic M762 ET Fuze was shown around the world on headline news as U.S. Soldiers used it during Operation Iraqi Freedom, back home the M762A1/M767A1 Integrated Product Team was putting the final touches on the next generation of the M762/M767 series.

Maj. Gen. N. Ross Thompson III, commander of the Tank-automotive and Armaments Command, approved the Full Materiel Release for the M762A1 and M767A1 Electronic Time Artillery Fuzes on Aug. 3. This marked the first materiel release of an artillery fuze by Program Executive Office Ammo and the Program Manager Combat Ammunition Systems.

In August 1998, sponsored then by Army Materiel Command Deputy Chief of Staff for Ammunition, the Army awarded a Materiel Change Contract to L3-BT Fuze Products (formerly Bulova Technologies L.L.C) to upgrade the design of the Army's primary artillery fuzes, M762/M767 ET Fuzes.

The program's objectives were to improve producibility, enhance design robustness, enhance user interface, upgrade the technology and maintain the industrial base. The production of M762A1/M767A1 requirements to meet the fiscal year 1999 and 2000 artillery fuze requirements also were part of the program.

The M762A1 and M767A1 are nose-mounted fuzes that provide precision timed airburst and impact detonation capabilities designed to be compatible with all fielded and developmental 105mm and 155mm artillery projectiles. The fuze can be set manually without a tool, or automatically with an inductive setter in compliance with NATO standards.

M762A1 and M767A1 fuzes are intended to be an improvement over today's primary artillery fuzes, the baseline M762/M767 Electronic Time Fuze and the M577/M582 series, Mechanical Time Super Quick Fuze, by increasing rates of fire, reducing system response time and reducing human error.

The M762A1 is only used with cargo carrying projectiles, while the M767A1, with a booster assembly attached to its base end, is only used with high explosive fragmentation and bursting projectiles.

The plan began with the Design Enhancement Phase, followed by the Production Phase. The DE Phase consisted of a Validation Task, wherein design changes were proved out, followed by a very successful Pre-Production Qualification Test yielding 100 percent reliability in the time mode (primary mode of operation) and reliability of 99.1 percent in the impact mode.

Based on the PPQT success, the Type Classification standard designation was granted Feb. 5, 2001. The Production Phase of the MC contract started immediately with the M767A1.

Production was ongoing, when in September 2001 after competitive bidding (limited to U.S. and Canada), a single firm fixed price multiyear fiscal year 2001-05 contract with exercisable options to support full-scale production of the M762A1 / M767A1 fuze was awarded to L3-BT Fuze Products. Production of the multi-year contract began in July 2002. Ballistic lot acceptance testing proved highly successful yielding an overall reliability of 99.7 percent for the M762A1 and an overall reliability of 99.9 percent for the M767A1. A total of 182,144 M762A1 and 271,000 M767A1 fuzes have been delivered to the government without a production lot failure.



Last fall the M762A1/M767A1 program management responsibility and authority transitioned from the CCAC-Fuze Division to PEO Ammo/PM CAS. PM CAS, in cooperation with CCAC-Fuze Division management, made possible a rapid and smooth transition allowing the program and IPT activities to continue without interruption. The M762A1/M767A1 Integrated Product Team remained chaired by CCAC-Fuze Division, now under the management oversight of PM CAS.

The key for the remarkable performance of the M762A1/M767A1 fuzes is the Integrated Product Team teamwork. The diversity of knowledge and the excellent use of the resources allowed the multidisciplinary government-contractor IPT to deliver excellent products to the Army while concurrently looking for areas for future improvements.

The IPT teamwork was recognized at the 16th "Teams Tournament" held at Picatinny Arsenal, N.J., May 22 with the first place award in the Outstanding Concurrent Engineering/Integrated Product Team category (see <http://w4.pica.army.mil/voice2003/030620/TeamsTournament.htm> for details).

L3-BTFP continues to produce the M762A1/M767A1 fuzes to satisfy the requirements of the multiyear contract. The IPT continues working closely with the contractor sponsored by PEO Ammo/PM CAS.

Non-Line of Sight-Launch System provides smart transition from science and technology

By Jim Bowne, AMCOM Public Affairs Office

REDSTONE ARSENAL, Ala. – The Non-Line of Sight-Launch System is a key program for fulfilling the role of a networked fires weapon, which is an enabling capability for the Future Combat System.

The FCS approach not only involves weapon systems, but also an integrated network of systems. These systems can rapidly establish, alter, and terminate links between all relevant systems for Line of Sight, Beyond-Line of Sight, and Non-Line of Sight external and joint fire systems.

The NLOS-LS partially fulfills the non-line of sight mission in this concept by offering two missiles and a launch system integrated with the network. NLOS-LS will be an unmanned system and platform independent. NLOS-LS has been identified as one of the 19 core programs within FCS and receives funding through the FCS Program Element appropriated by Congress.

To manage the acquisition of the NLOS-LS and to transfer technology from the Defense Advanced Research Project Agency, the Army Acquisition Executive directed the Program Executive Officer, Tactical Missiles to establish the NLOS-LS Task Force. Based upon the DARPA Netfires program, the Task Force formed an acquisition strategy to contract to Raytheon and Lockheed-Martin for pre-System Development and Demonstration efforts for the Precision Attack Missile the Loitering Attack Missile and the Container/Launch Unit. The Task Force intends to transition the DARPA technologies and award a System Development and Demonstration contract to a recently established joint venture of Raytheon and Lockheed Martin, called the Netfires Limited Liability Corporation.

The U.S. Army Aviation and Missile Research, Development, and Engineering Center at Redstone Arsenal, Ala., is working with the NLOS-LS Task Force and the contractors, supporting the development of NLOS-LS by inserting technologies for risk reduction and performance enhancement. This action will reduce program risk for the System Development and Demonstration Increment I, as well as demonstrate and integrate key technologies in support of Increment II. The NLOS-LS system will be accepted by the government and provided to the FCS lead system integrator, Boeing Corporation, as government furnished equipment for fielding with the FCS Unit of Action.

According to Greg Haynes, NLOS-LS Science and Technology Objective (STO) Program Manager at AMRDEC, the NLOS-LS program will develop and test a containerized, platform-independent, multi-mission weapon system. "These systems will provide rapid response and lethality in packages that require significantly fewer personnel, decreased logistical support, and lower life cycle costs," Haynes said. "At the same time, they will increase survivability and lethality compared to current forces."

The system's primary purpose is to provide responsive, precision attack of high-payoff targets in support of the Unit of Action in concert with other Unit of Action NLOS, external, and joint capabilities.

"The system also provides a 'discriminating' capability via automatic target recognition and limited battle damage assessment," Haynes said. "The system has flexibility to respond to the full complement of Unit of Action sensors, Special Operation Forces, and other Unit of Employment, or joint elements."

The NLOS-LS STO will mature critical technologies in a coordinated approach with the NLOS-LS Task Force that will potentially transition to NLOS-LS Increment I and ultimately will achieve Increment II/Future Force requirements.

"The task of the STO is to demonstrate performance sufficient to meet system requirements that can be transitioned to the tactical design in a near-fieldable status," Haynes said.

During FY04 through FY07, the science and technology efforts will be focused on developing those technologies that have been identified as principal to meeting the objective performance required in the FCS operational requirements document, as well as providing margin to achieving the threshold requirements.

“Specifically, the technology areas that will advance as transition potential for Increment I System Development and Demonstration are the PAM and LAM seekers, processing capabilities, propulsion systems, tandem warhead integration, and insensitive munitions,” Haynes explained. “In addition, a communications networking solution for NLOS-LS missiles will be demonstrated, based on the Networked Fires using NLOS-LS STO efforts currently on-going.”

In Increment II, efforts will be directed toward performing trades studies of alternate variants (Air Defense) and maturing new, high-payoff technologies to meet the objective NLOS-LS requirements.

The NLOS-LS science and technology objectives support the spiral development concept. As such, the STO effort will transition affordable, mature components through a subsystem development effort prior to the NLOS-LS Increment I critical design review during FY06-07 and continue risk reduction and critical component maturation for Increment II/Objective NLOS-LS during FY07 and beyond.

“The development of the NLOS-LS is in direct response to the Army’s vision for the Future Force and the Future Combat System,” Haynes explained. “And the

NLOS-LS technology development is in response to Unit of Action objective capability requirements for responsiveness, deployability, versatility, lethality, survivability, and sustainability.”

In accordance with the spiral development process, the purpose of the NLOS-LS risk reduction/performance enhancement program is to further refine technology development and demonstrate technology maturity facilitating NLOS-LS Increment I/II capability.

Testing will facilitate risk reduction and include user feedback, ensuring that mature technologies are identified that provide the best possible capability. Maximum use will be made of data resulting from the current and planned DARPA-directed and contractor-executed Netfires demonstrations, including captive flight test, controlled vehicle test, and guided vehicle test.

AMC honors top 10 greatest inventions

By *Larry D. McCaskill, RDECOM Public Affairs Office*

ABERDEEN PROVING GROUND, Md. – Thomas Edison, Alexander Graham Bell and Granville T. Woods shared a common bond: creating or improving products that have benefited mankind.

Edison and Bell invented the light bulb and telephone, respectively. Woods, who improved both Edison's and Bell's inventions, is not as highly recognized, yet his achievements are just as important to today's technology.

In the spirit of these great inventors, the U.S. Army Materiel Command has developed the Greatest Inventions Awards Program (2002) to recognize AMC's best technology solutions for the Soldier. The awards recognize the inventions that best demonstrate military application and utility, said Bob Jenkins, the program's staff officer in the Research, Development and Engineering Command's Systems of Systems Integration Office.

"There are no differentiating categories. The AMC commanding general's instructions for the program specifically stated that multiple inventions would be recognized, that inventions would be broadly defined, and that categories should not be by commodity or branch," Jenkins said.

Evaluators judged the nominations based on their impact on Army capabilities (breadth of use and magnitude of improvement over existing systems); their potential benefit outside the Army; and, their inventiveness.

Six U.S. Army Active Divisions and the U.S. Army Training and Doctrine Command evaluated nominations. Normally 13 organizations would perform the judging, but due to ongoing worldwide operations, only six divisions were available. After review of the 33 nominated packages, the evaluators provided their ranked list to RDECOM for consolidation into a list of 10 inventions. AMC then sent the list to Lt. Gen. Richard A. Cody, the Army's deputy chief of staff for operations and plans, for final selection and approval.

Each of the 10 selected teams will receive an award; the other nominated team members will receive certificates of participation.

All of the inventions were ranked as equally important, Jenkins noted.

"We used a banding approach because of the diversity of the nominations. Identifying first, second and third-place winners would not have been appropriate," Jenkins added.

The AMC Greatest Inventions Program 2002 Award Winners are:

Advanced Chemical-Biological Mask, Edgewood Chemical Biological Center, Aberdeen Proving Ground, Md.;

Automated Biological Agent Testing System (ABATS), Edgewood Chemical Biological Center, Aberdeen Proving Ground, Md.;

Biological Attack Warning System (BAWS), Edgewood Chemical Biological Center, Aberdeen Proving Ground, Md.;

Cooling/Heating Body Garment and Method of Manufacturing, Natick Soldier Systems Center, Natick, Mass.;

Interceptor Multiple Threat Body Armor, Natick Soldier Systems Center, Natick, Mass.;

Modular Integrated Communications Helmet (MICH), Advanced Combat Helmet (ACH) (TC-2000 Ballistic Helmet), Natick Soldier Systems Center, Natick, Mass.;

BASIC Hornet (XM93), Armament, Research, Development and Engineering Center, Picatinny Arsenal, N.J.;

RAREfaction waVe guN (RAVEN), Armament, Research, Development and Engineering Center, Picatinny Arsenal, N.J.

Agile Commander Advanced Technology Demonstration (ATD), Communications-Electronics Research, Development and Engineering Center, Fort Monmouth, N.J.;

Full Spectrum Active Protection Close in Layered Shield (FCLAS), Tank-automotive and Armaments Research, Development and Engineering Center, Warren, Mich.

Award recipients will be acknowledged at a ceremony Nov. 12 at Fort Belvoir, Va.

The need to monitor the environment for biological warfare agents has taken on an important role in protecting the U.S. Homeland and the economic impact of using traditional diagnostic methods is significant and will greatly tax current manual operations. The ABATS is the first fully automated system ever built for biological weapon screening of environmental samples that employs the complementary layered strategy that is the cornerstone of Department of Defense detection doctrine. The mandate for the ABATS has been achieved but the Edgewood robotics research team and efforts are working on the next generation of robotic systems that capitalize on the lessons learned from the initial system.



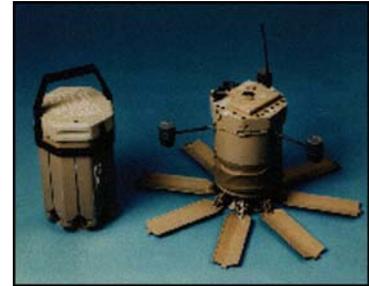
**Automated Biological Agent Testing System,
Edgewood Chemical Biological Center,
Aberdeen Proving Ground, Md.**

The Natick team has developed referenced body cooling/heating garment, which utilizes fluid-carrying tubes and provides both air and vapor permeability to promote evaporative heat transfer while also providing conductive heat transfer. Design-wise, the vest is worn close to the skin under protective clothing and hugs the torso as tightly as possible to achieve maximum cooling or heating. Essentially, it is like a poncho with Velcro shoulder and side closures. The vest was designed to be manufactured without sewing or with stitchless technology to save both time and money in fabrication. The trilaminate design makes it far more comfortable for the wearer and efficient in terms of cooling versus a sewn tubed or bladder type cooling vest.



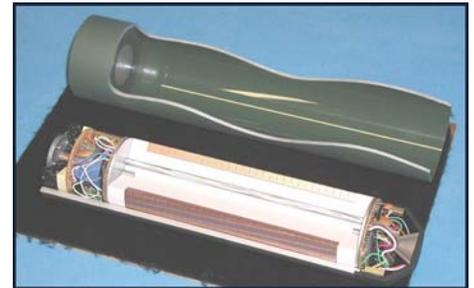
**Cooling/Heating Body Garment and Method
of Manufacturing, Natick Soldier Systems
Center, Natick, Mass.**

Hornet's acoustic and seismic sensors detect, classify, and track approaching targets up to 600 meters away. As the target reaches its closest point of approach within the 100-meter engagement range, Hornet launches a projectile (called a sublet) in a trajectory over the target. The sublet uses an infrared sensor to detect the target and determine an aim point. The sublet then fires an explosively formed penetrator to defeat the target. It replaces or enhances conventional minefield operations. Hornet is a smart munition, or mine, that can defeat threat vehicles at a range of up to 100 meters from its emplacement site. Conventional mines do not have a range. A Hornet obstacle of 20 munitions has the effectiveness of a conventional minefield of 1224 mines.



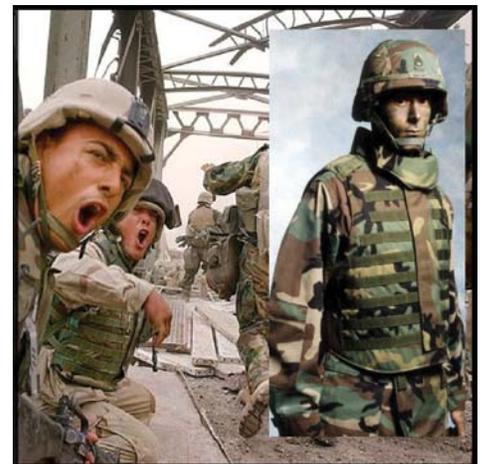
BASIC Hornet (XM93) – Armament, Research, Development and Engineering Center, Picatinny Arsenal, N.J.

FSAP detects, tracks, intercepts and physically defeats large-caliber threats at a distance sufficiently far from the defended vehicle to reduce the lethal effects of the threat and assures vehicle survival. FCLAS, the FSAP Close-In Layered Shield, can complement a long-range system or stand alone by providing vehicle protection for extremely close-in attacks from hand-held heat such as rocket propelled grenades, small antitank guided missiles, and the like. This is smoke-tube-launcher-based system, which boasts wide soldier familiarity. FCLAS is therefore easily integratable into emerging vehicle concepts or legacy platforms.



Full Spectrum Active Protection Close In Layered Shield (FCLAS), Tank-automotive and Armaments Research, Development and Engineering Center, Warren, Mich.

INTERCEPTOR is the model name for the joint Marine Corps/Army body armor system. To no surprise this item was worth its weight in gold. Small Arms Protective Insert (SAPI) plates saved lives, preventing death or serious injury in five separate incidents. In the words of Capt. David Bardorf, 2D Tank Bn., "SAPI is God's gift to the Marine Corps." The new modular body armor system consists of an Outer Tactical Vest (OTV) system and SAPI plates. INTERCEPTOR is 40 percent lighter with more protection than its predecessor system due to the engineered ballistic system. Because it is modular, users can tailor the ballistic protection worn to the level of threat, weight and mobility priorities without encumbrances in combat. The system modularity further allows individual components or sub-components to be replaced or upgraded with technology advances without obsolescing the entire system for operation and support cost reduction.



Interceptor Multiple Threat Body Armor, Natick Soldier Systems Center, Natick, Mass.

Conceptually, the face piece, lens, and filtration system are designed using contoured geometry. This design approach minimizes the standoff to the wearer and maximizes compatibility with external interfaces such as weapon sighting systems. Geometry constraints such as facial anthropometrics, filter and valve surface area requirements, and known external interface requirements are balanced to maximize performance. The mask industry has undertaken very little change in the last several decades. This invention utilizes numerous design and technology features that are novel to the industry. The invention also introduces a disposable or maintenance-free mask concept that was designed to eliminate mask decontamination.



Advanced Chemical-Biological Mask, Edgewood Chemical Biological Center, Aberdeen Proving Ground, Md.

The ballistic helmet provides 9 mm (handgun) and fragmentation protection within the full spectrum of environments (climatic, salt water, fresh water, POL, etc). The helmet allows maximum sensory awareness for the user, which includes unobstructed field of view and ambient hearing capabilities. It also allows mounting of night vision devices and oxygen masks. The helmet's retention/suspension system provides maximum balance, stability and comfort, while providing the proper size, fit and ventilation.



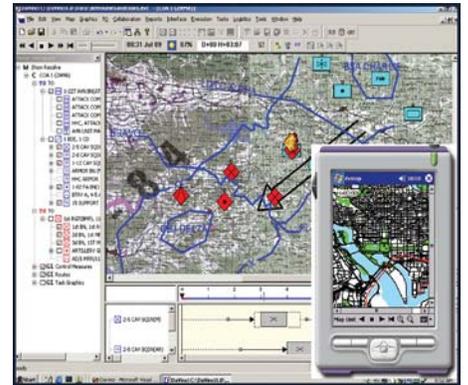
Modular Integrated Communications Helmet (MICH), Advanced Combat Helmet (ACH) (TC-2000 Ballistic Helmet), Natick Soldier Systems Center, Natick, Mass.

The first successful real-time, lightweight biological alarm system, BAWS is an array of remotely placed sensors telemetry-linked to a central command and control station. BAWS was designed to detect and warn against a biological incident before exposure. BAWS consists of a remoted array of point detectors networked to a central command and control node. The deployment concept is to place the detectors around valued assets to detect biological agent clouds as they approach the asset. Biological clouds are interrogated by these detectors, which report to a central command and control node where appropriate warnings are issued. Over the past two years, C/BAWS systems have been procured by two NATO countries, used in several Homeland Defense Demonstrations and is being proposed for a U.S. Air Force/U.S. Marine Corps-led Advanced Concept Technology Demonstration addressing arrayed sensors and data fusion concepts.



Biological Attack Warning System (BAWS), Edgewood Chemical Biological Center, Aberdeen Proving Ground, Md.

Known as "DaVinci," this system provides a framework to move the focus of digital planning away from the low level details of movement routes to the higher-level concepts of plan, task, activity and resource. The goal is to provide a planning and execution monitoring system in which the user can specify administrative and tactical tasks at a level of detail sufficient to enable the computer to "fill in the details." DaVinci is being developed to facilitate the planners' conceptual and creative process by conforming more closely to the way in which planners work, allowing the agile commander to focus on the very important but less tangible aspects of planning such as the purpose of tactical maneuvers and leave to the computer the more technical or doctrinal aspects of calculating formations and resource.



Agile Commander Advanced Technology Demonstration (ATD), Communications-Electronics Research, Development and Engineering Center, Fort Monmouth, N.J.

If engineers could figure out how to uncork the breech and feed the gases from the gun chamber through a rocket nozzle –after the bullet had begun its motion down the barrel – what would happen? Because of the key role of the rarefaction wave, this kind of gun has been named the RArefaction waVE guN or RAVEN. It was patented in October 2002 and assigned to the U.S. Army. No other known technologies reduce barrel heating by 40 percent. This was experimentally demonstrated, and is the direct consequence of getting the hot propellant gases out of the barrel before the bullet has even left the muzzle. This would enable a 70 percent increase in the sustained fire rate and a 70 percent increase in the number of burst-fire shots. Reduction of recoil momentum by 61 percent exceeds that achievable by a muzzle brake. Since recoil stroke is proportional to the square of momentum, this would allow an 85 percent reduction in recoil stroke of the cannon.



RArefaction waVE guN (RAVEN), Armament, Research, Development and Engineering Center, Picatinny Arsenal, N.J.

TARDEC debuts system that generates water from exhaust

By Paul D. Mehney, TARDEC

WASHINGTON, D.C. – In extreme conditions the average Soldier requires 3.5 gallons of water per day to prevent dehydration—amounting to nearly one-third of the current and future force's daily requirement. Researchers at the U.S. Army Tank-automotive Research, Development and Engineering Center are developing and testing innovative water purification, generation and recovery technologies.

The goal of reducing water logistics is achieved by pursuing two complementary objectives: development of advanced water purification technologies that are more energy efficient, lightweight and compact than current systems, and generation and recovery of potable water from alternative sources such as vehicle exhaust or ambient air.

At the AUSA Annual Convention Oct. 6-8, TARDEC unveiled an on-board system that generates potable drinking water from vehicle exhaust. Mounted in a standard military Humvee, the water from exhaust system, jointly developed by TARDEC and its industry partners, Hamilton Sundstrand and Lexington Carbon Company, can produce approximately one gallon of water for every two gallons of fuel used. Hamilton principal engineer Doug Snowdown said the system can be mounted in any current or future vehicle and "can produce about one gallon of clean drinking water for every hour of standard vehicle operation."

The water from exhaust system operation is based on the ability to combine oxidize hydrogen present in vehicle exhaust, which produces water. For show purposes the unit was mounted in the two wheel wells of the Humvee, one side containing a heat exchanger which lowers the temperature of the exhaust. The exhaust is pumped into an evaporative cooler where the temperature is further lowered to a point where water condenses.

From there the condensate, which resembles muddy water and smells of sulfur, is sent to a small receiving tank before being pumped to the other side of the vehicle where a MIOX filtration system awaits. The filter, capable of treating up to 150 gallons of water, uses a mixed oxidant generation system to make the water drinkable. To help monitor the life of the filter, sensors are mounted inside the crew compartment on the vehicle to let Soldiers know when the system is in use and allows them to turn it off when it is not needed.

Once enough potable water is present in the on board storage tank, Soldiers can draw water from a tap located near the rear passenger side of the vehicle. The Environmental Protection Agency has stated that the water meets its standards for drinking water and the Army Surgeon General's Office is wrapping up testing on their approval for field use. Future plans for water from exhaust include formal field testing at Yuma Proving Ground, Ariz., next year.



Recently unveiled at the AUSA Annual Convention, TARDEC's water from exhaust system, mounted on a standard HMMWV, is capable of producing one gallon of potable drinking water for every two gallons of fuel consumed.



Located on the vehicle's passenger side, the MIOX filtration system purifies the exhaust condensate into clean drinking water, which is then stored in the water storage tank.

Technology helps protect Soldiers in Afghanistan from land mines

By Jennifer Brennan, Belvoir Eagle

FORT BELVOIR, Va. – Soldiers supporting Operation Enduring Freedom in Afghanistan have equipment that will help them to detect and neutralize anti-personnel land mines, thanks to the efforts of the Communications-Electronics Research, Development and Engineering Center's Night Vision and Electronic Sensors Directorate's prototyping team.

The equipment can detect, detonate or neutralize landmines, said Maj. Peter P. Lozis III, assistant project manager for the Countermine Division, Project Manager, Close Combat Systems.

Officials sent equipment to Afghanistan to help Soldiers in locate land mines, which can be visible or buried below the surface, said Lozis, displaying two plastic mines that can fit in the palm of your hand. Some mines are much larger.

Lawrence J. Nee, chief of the Countermine Division, Project Manager, Close Combat Systems, commended the team's efforts on sending equipment to engineer Soldiers.

"Our role is to identify the best type of equipment that will accomplish the mission for the Soldiers," Nee said.

The project office for countermine equipment at Fort Belvoir trains and fields all combat engineer units in the Army. Twelve mine detection and neutralization systems support Soldier efforts overseas, Lozis said, ranging from hand-held mine detectors to vehicles that allow Soldiers to clear land mines. Once mines are found, Soldiers break the mines apart mechanically and destroy them or use explosives to blow them apart.

Minelab F1A4, a commercial, off-the shelf device that uses a metal detector to locate mines, was sent to Afghanistan, then followed by a more advanced technology developed at Fort Belvoir. The handheld standoff mine detection system, HSTAMIDS, uses the Minelabs metal detecting capability combined with ground-penetrating radar, which notifies of a change of density in the soil.

A commercial mine-clearing vehicle, called an Aardvark flail, "looks like a piece of farm equipment," Lozis added, noting that the vehicle's chains pound the ground, breaking the mines apart.

In response to Enduring Freedom, a berm sifter with armor protection, solid tires and a rotary sifter was developed on Fort Belvoir, and added to a bucket loader. The additional equipment provides operators with more protection from anti-personnel mine blasts, and is used for clearing areas such as airfields, Lozis said.

Nee added that to meet Soldier needs, the team integrated the berm sifters in three months, part of a cooperative effort among countries taking part in the Humanitarian Demining program.

The team fielded other equipment, including the following:

- Safety boots: Soldiers can wear safety shoes that disperse their weight, to help prevent a landmine from detonating. Similar to walking on pillows, the boots are 27 1/2 inches-long, 13 1/4-inches wide and 5 1/2-inches high. Each boot weighs 5.7 pounds.



Soldiers supporting Operation Enduring Freedom have another option in clearing land mines, thanks to an Office of the Project Manager, Close Combat Systems' Countermine Division managed effort supported by the CERDEC's Night Vision and Electronic Sensors Directorate. The berm sifter was added to a bucket loader with extra armor to protect the operator while clearing mines. Photo courtesy Alexandra Calloway and John Reeser, Thomas Associates, Inc.

- **Anti-personnel Obstacle Breaching System:** Two Soldiers, each wearing a 63-pound backpack, lay the packs on the ground, connect a rocket to a line charge and release the rocket. A rocket-propelled 45-meter line charge linked to a detonating cord destroys the mines underneath it, providing a footpath for Soldiers, Lozis said.
- **Flare:** The flare burns through the land mines' plastic or metal case holding the explosives, causing the land mines to burn rather than detonate.
- **Mine foam:** The Soldier can spray this yellow marking agent, which raises and foams "like Styrofoam in a can," Lozis said, around the mine to mark its location.

Lozis went to Afghanistan for 10 days in early in June to assess the equipment and gather feedback from the engineers.

"They love it," he said. "It's a lot more reliable in detecting mines and they have a lot of confidence in the systems."

At an award ceremony on Sept. 12, Brig. Gen. Paul S. Izzo commended the team for its efforts. The commendation read, in part, "The resulting equipment will have far-reaching impacts on Operations Enduring Freedom and Iraqi Freedom that can only be measured by the numbers of lives saved and injuries prevented."

New 'family' spreads warmth in tents safely, efficiently

U.S. Army Soldier Systems Center

NATICK, Mass. – Heating tents safely, effectively and efficiently is now much simpler thanks to the Family of Space Heaters, FOSH, developed by Product Manager Force Sustainment Systems at the U.S. Army Soldier Systems Center.

The FOSH uses the latest advances in combustion, power generation and microprocessor technology to provide comfort and protection for Soldiers, supplies and equipment in tents during cold weather operations in the field. This replaces the World War II-era M-1941 "Pot Belly" and M-1950 "Yukon" heaters and eliminates serious operational deficiencies and safety hazards associated with such antiquated heaters.

Army Regulation 420-96 restricts the use of unvented space heaters in living quarters or enclosed locations where Soldiers sleep, and the U.S Army Safety Center advises commanders not to allow the use of these heaters where Soldiers work or sleep. While many seemingly attractive commercial space heaters are available in today's marketplace, they are unjustified from a safety, performance and economic perspective, and military units should replace their stock of these heaters with standard vented military heaters.

Commercial unvented kerosene or propane-fueled heaters that release exhaust directly into the living space present a serious risk of injury or death to Soldiers. Kerosene heaters "are intrinsically dangerous and should not be used in field environments," according to the U.S. Army Center For Health Promotion and Preventative Medicine.

Besides safety hazards, commercial heaters do not meet military requirements that are satisfied with the FOSH. Some of the key capabilities of the FOSH include:

- Operation without electrical power.
- Multi-fuel operation on diesel, JP-8, JP-5, kerosene, wood or coal.
- Efficient, clean-burning combustion requiring little maintenance.
- Operation in temperatures down to minus 60 degrees F.
- Self-contained, lightweight, portable, rugged and simple to operate.
- Venting exhaust outside the tent.
- Interfaces with and meets heating requirements for all standard military tentage.

The FOSH consists of the Space Heater Small, SHS; Space Heater Medium, SHM, or H45; Space Heater Arctic, SHA; and Space Heater Convective, SHC.

The SHM, SHA and SHS are non-powered radiant heaters that operate inside the tent, and the SHC is a self-powered convective heater that operates outside the tent. The Thermoelectric Fan is an accessory used with the SHM and SHA heaters to circulate heated air inside the tent.

The SHM, SHA and SHS heat through radiation and natural convection, using a new vaporizing burner tube technology that overcomes major combustion and safety problems plaguing the non-powered heater industry for the past 50 years. In old heaters, fuel would pool in the bottom of the burner to be vaporized and burned. If fuel entered faster than it could be vaporized, the burner would flood and the operator would end up with a "runaway" heater.

The patented burner design vaporizes fuel in a tube, eliminating the pooling of raw fuel during operation and the possibility of flooding the pot. It also provides a multi-stage liquid-to-vapor combustion process that results in cleaner, more efficient combustion requiring far less burner maintenance.

A patented multi-fuel control valve is incorporated into each heater, which provides a new capability to compensate for dissimilar fuel viscosities and maintain a consistent flow rate among the various types of liquid fuels and temperatures encountered in the field. A sight glass allows the operator to view the flame and heater operation without opening the lid. The SHC, the most advanced of all four heaters, is a self-powered, thermoelectric heater that provides forced hot-air circulation without external power normally supplied by a field generator.

The SHC generates its own electrical power, without moving parts, through thermoelectric modules located in the combustion chamber that convert waste heat into electricity. The internal generation of electrical power gives the SHC the extra capabilities of single switch operation, automatic safety and temperature controls, operation without the need for a fire guard and significantly higher combustion efficiencies, all without an external power supply.

For troubleshooting, the SHC comes equipped with a remote intelligent control box that tells the operator when there's a problem and how to fix it.

All fielded FOSH units are available through the Defense Supply Center Philadelphia. Listed below are some specifications of the individual heaters. Costs are estimated.

Space Heater Small: Intended for the Soldier Crew Tent, the SHS has a maximum output of 12,000 BTU and completely self-stores all its accessories. NSN: 4520-01-478-9207. Dimensions: 16" L x 9" W x 14" H. Weight: 35 pounds. Cost: \$660.

Space Heater Arctic: Designed to heat the 5 and 10-man Arctic tent and other shelters with a floor area of 100-200 square feet, the SHA has a maximum output of 25,000 BTU and is completely self-storing. NSN: 4520-01-444-2375. Dimensions: 17" L x 9" W x 17" H. Weight: 41 pounds. Cost: \$780.

Space Heater Medium: The barrel-shaped SHM or H45 is intended for the larger GP, MGPTS, MCPS and TEMPER tents and delivers a maximum of 45,000 BTU. An 80,000 BTU model with the same footprint should be available in about two years. NSN: 4520-01-329-3451. Dimensions: 18" diameter x 24" tall. Weight: 65 pounds. Cost: \$550.

Space Heater Convective: The SHC can be used with any tent and has an output of 35,000 BTU. A 60,000 BTU model with a similar dimensions and weight should be available in about two years. NSN: 4520-01-431-8927. Dimensions: 40" L x 14" W x 18" H. Weight: 78 pounds. Cost: \$6,700.

Fan improves heater performance, tent comfort

U.S. Army Soldier Systems Center

NATICK, Mass. – At first glance, the self-powered Thermoelectric Fan used with the Army's Family of Space Heaters may appear to be a high-priced air mover.

However, when used with non-electric space heaters, the fan/tent heater combination is the most inexpensive option available to Army units for temporary space heating, costing several thousand dollars less than electric-powered forced hot air systems.

The fan was conceived and developed by the Shelters Team of the Product Manager-Force Sustainment Systems at the U.S. Army Soldier Systems Center as an important accessory to space heaters that operate on liquid or solid fuel. It's manufactured by Aspen Systems, Inc. in Marlborough, Mass.

In uninsulated structures, such as tents and barracks, the forces of natural convection are so strong that air heated by the stove quickly rises to the ceiling, leaving the area near the floor much colder.

With the fan, heated air is circulated downward creating more even heat distribution.

Testing conducted in the Soldier Systems Center arctic chamber at minus 60 degrees F showed that the fan can increase the temperature 1 foot off the floor by more than 20 degrees F.

This is important because soldiers sleep on or near the floor, and the most difficult parts to keep warm are the feet.

"With the fan we can have the stove barely on and it will warm you throughout the tent, whereas before you had to be right on the stove to stay warm, and your backside was still cold," said Staff Sgt. Chris Harder in Fort Gordon, Ga. "I wish I had these in my unit over in Korea. It would make a huge change in wintertime comfort."

When placed on a heater surface, the self-powered fan converts a small amount of heat energy directly into electricity to drive the fan's impeller. It improves the performance of the heater by creating warmth throughout a larger area with the same fuel consumption, or it can heat the same area with less fuel.

Reduced fuel consumption, primarily JP-8 or diesel, is an important advantage because fuel must be transported along with the field unit, costing the Army as much as \$12-\$20 per gallon.

Logistic fuel is considerably more important than ammunition at every point along the battlefield except at the leading edge of the fighting, and even there fuel is more valued from time to time, said Gen. Paul Kern, commander of the U.S. Army Materiel Command, at the Society of Automotive Engineers World Congress in March 2003. Fuel use is critical to the Army because fueling stations are remote in a combat zone.

In cold climates, the Army has estimated that a single fan can save as much as 320 gallons of heating oil in one heating season. Actual results depend on the local climate and annual "degree-days," which is the difference between 65 degrees F and the day's average temperature.

Since the fan's introduction in 2000, the Defense Logistics Agency has received orders for more than 6,000 fans. Units can purchase the fan, currently priced at \$590, through the DLA Web site at www.dscp.dla.mil or order it through the MILSTRIP system.

New program to develop Army scientists and engineers

By Karen Jolley Drewen, RDECOM Public Affairs Office

WEST POINT, N.Y. – The Army of the future will have more than advanced technology and equipment. It will have advanced scientists and engineers.

Gen. Paul J. Kern, commander of the U.S. Army Materiel Command, welcomed the first cadre of 33 officers into the Uniformed Army Scientist and Engineer Program at the U.S. Military Academy at West Point on Oct. 1.

“The uniformed Army scientist and engineer officer, equipped with field experience and an advanced engineering or hard science degree, provides the Army with specialized technical skills and understanding,” Kern said. “These officers enable our Army to make informed decisions on new and emerging technology and then to rapidly transition that technology from the laboratory to warfighters on the battlefield.”

The UAS&E Program provides promotion opportunities through colonel and beyond. Approved in August as an area of concentration within the Army Acquisition Corps, the program enables the Army “to develop and grow future leaders for our research and development organizations and organizations charged with providing rapid, technological solutions to our warfighters such as the Rapid Equipping Force and the Agile Development Center.”

This will provide a cadre of military experts who will effectively bridge combat development, material development and technology implementation in field operations. These officers will be on the lookout for cutting edge technology to insert into existing programs to achieve real time technology solutions to immediate battlefield requirements while providing technical leadership to meet future combat system program needs.

Kern noted that historically, officers in the scientific field or who pursued advanced scientific or engineering degrees “could not compete with their operational peers and were eventually passed over.” However, the Army’s modern weapon systems and technology requires a trained, cadre of technology-literate line officers and science, math, and engineering-educated officers.

Kern credited the Hon. Claude M. Bolton Jr., Assistant Secretary of the Army (Acquisition, Logistics and Technology) with making the program a reality. Bolton was represented at the ceremony by his military deputy, Lt. Gen. John S. Caldwell, Jr.,

“With Secretary Bolton's support and the hard work from many others we were successful. I would like to personally thank Secretary Bolton for supporting this program and for making today a reality.

The officers inducted at the ceremony hold doctorates and experience in biology, chemistry, computer science, engineering management as well as biomedical, chemical, computer, electrical, materials, mechanical, robotics, and software engineering.

“From their uniforms it is also clear that they are soldiers with combat and field experience,” Kern added. “Within this group are four Bronze Stars, one Bronze Star with a V device, one Purple Heart, deployment experience in Operations Desert Shield, Desert Storm, Enduring Freedom, and Iraqi Freedom, and more than 50 overseas tours to Saudi Arabia, Kuwait, Panama, Italy, Germany, Korea, Bosnia, and Kosovo. These officers have been there and done that.

“I see these officers before us spearheading the Army's efforts to connect combat development, materiel development, and technology implementation with rapid integration into field operations.”

Our armed forces are transforming to become more lethal, agile and network-centric. Within this effort the US Army continues as one of the largest users of widely diverse and advanced technology within the U.S. armed forces.

Kern challenged the members of the program to get vital technology and solutions to the field quickly.

“Remember, our soldiers do not complain. They go to war and win with the equipment they are given,” he said. “They are counting on you to provide them the best solutions and the best equipment in the shortest time possible. Together, we won’t let them down.

UAS&E officers will also serve in Army and Department of Defense laboratories; the Army’s Research, Development and Engineering Command; West Point; and Army, Joint Staff and key scientific and engineering advisory positions throughout the Army and DOD.

Unique partnership leads to breakthrough technology in water testing

By Heather Hoerdemann, ECBC

ABERDEEN PROVING GROUND, Md. – A 911 operator receives a tip that an unknown quantity of VX nerve agent has just been injected into a local water reservoir. What is the immediate threat to the public? How far could the nerve agent have been transported? How much of the water distribution system has been contaminated?

These are a few of many critical questions Edgewood Chemical Biological Center scientists and engineers will answer when test operations commence at ECBC's water distribution test loop in November.

Because safety of the nation's drinking water supply is a top security concern, ECBC staff recently initiated a precedent-setting partnership with two federal organizations with a significant stake in water safety: the U.S. Environmental Protection Agency National Homeland Security Research Center; and the Army Corps of Engineer's Construction Engineering Research Laboratory.

Concerned with water safety for civilian and military populations respectively, both EPA and CERL have been developing models and test sensors to detect and predict the behavior of chemical and biological agents in water systems. Well aware of technical accomplishments in the homeland security effort, and internationally renowned for its expertise and testing facilities uniquely designed for the total containment and handling of chemical warfare agents, ECBC recognized the untapped potential of joining with these organizations in a concerted effort to design and construct a model system for testing and monitoring agent contamination of water distribution systems.

"What make's ECBC's pioneering of the chemical agent water test loop so important is that while other organizations with model water distribution facilities can test toxic industrial compounds such as pesticides, we are the only facility in the nation that can test pure chemical warfare agent at both high and low density concentrations," stated Alex Pappas, ECBC water test project lead. Dr. Irv Baumel, ECBC Federal Liaison for Homeland Security Research, indicated the water loop also provides an important test bed for evaluation of novel decontamination technologies for removing chemical agents from the water as well as from pipe surfaces in the distribution system.

Collaborating with the two organizations in the design of the test loop, ECBC spearheaded construction completing the modular, two-part test loop in three months. The sophisticated structure will be able to track the behavior of varying concentrations of chemical warfare agents and a limited spectrum of biological agents across a broad range of water parameters and flow rates such as changing pH levels and turbulence. Both plan to use the water loop to conduct studies in these areas.

The intricate conduit system is intended to mimic the dynamics of water distribution environments such as a water utility delivering drinking water to one's home. A portion of the loop network comprises more than 2,000 feet of piping of varying age, size and material and allows for the modular switching out of an assortment of pipe types. This feature, coupled with the system's ability to manipulate residence timing, lends itself to replicating practically any water transport scenario.

Pappas anticipates the facility will become fully operational as early as November 2003. Collected test data will assist current partners and future clients in developing and refining water distribution models and enable them to predict and respond to unforeseen incidents.

ECBC's unique inter-agency partnership in the design and erection of the water test loop is a prime example of the critical role the center continues to play in protecting the warfighter both at home and abroad as well as the homeland. Through its Technology Transfer Program, ECBC seeks opportunities to collaborate with other agencies, both federal and private, to conduct research and technical development in this arena.

FMS tank munition achieves key milestone

By Frank Altamura and Jack Crowley

Key U.S. government, contractor, and Egyptian Army personnel celebrated the successful completion of production qualification testing of the third generation Government of Egypt 120mm Armor Piercing Fin-Stabilized Discarding-Sabot-T KE-WA2 tank round at the Aberdeen Test Center, Aberdeen Proving Ground, Md., in July.

The KE-WA2, developed by General Dynamics Ordnance and Tactical Division was approved for production in early September, pending approval of a new FMS case.

In addition to a full inventory of developmental, training, and production munitions that are managed or supported by the Office of the Project Manager, Maneuver Ammunition Systems, OPM MAS has enjoyed an interesting, long-term relationship with the government of Egypt.

In 1994 the Egyptian government approached the U.S. government for development and production of a kinetic energy tank munition to support their Abrams fleet. Using tungsten alloy as the anti-armor penetrator, or "kill mechanism," the initial cartridge, was called the KE-W – "W" is the periodic table symbol for tungsten. In 1998 a second FMS case was implemented, calling for a more advanced cartridge, the KE-WA1. In both cases GD-OTS (formerly Primex Technologies) was the prime contractor. Additional quantities of KE-WA1 were provided by a subsequent FMS case approved in 2001.

Although there is no intent for these rounds to be released to the U.S. Army, they were subjected to the same testing, with the exception of U.S. Army user tests, required by the U.S. Army for its own ammunition.

Frank Altamura has been OPM MAS item manager for the KE-W family since November 2002, from OPM MAS' King Ko. Dave Vandereedt is the GD-OTS Program Manager for the KE-WA2.

National Capital Region Experimentation Portal

CERDEC Night Vision and Electronic Sensors Directorate

FORT BELVOIR, Va. – The challenge was to get four remote locations, 22 organizations with more than 200 people and 200 computers to run a unified war game using multiple simulation tools.

The result was the U.S. Army Research, Development and Engineering Command's Virtual Distributed Laboratory Modeling and Simulation Science and Technology Objective's First Application Exercise, held in April, one of several National Capital Region Experimentation Portal events hosted by Communications-Electronics Research, Development and Engineering Center's Night Vision and Electronic Sensors Directorate.

The NCR Experimentation Portal at Fort Belvoir, Va., known simply as "The Portal," is a virtual prototyping and simulation facility networked into key Future Force and Future Combat System live/virtual and constructive simulation events. This high bandwidth network, which has a classified accreditation, uses state-of-the-art audio-video presentation and control systems to provide a local venue for Army, Department of Defense and Congressional leadership to have interactive access to Future Force experimentation.

The first event hosted on the Portal was the weeklong FCS Lead Systems Integrator Component Technology Development Capstone demonstration, presented by the LSI and FCS Project Manager's Office. Hundreds of government and industry representatives were involved to demonstrate the FCS concept to DoD and Congressional representatives through briefings, virtual simulations and videos. This effort involved close coordination with Unit of Action Maneuver Battle Laboratory from Fort Knox, Ky., the Institute for Creative Technologies, the LSI and the Army's Future Force Taskforce.

Technologies and operational concepts were demonstrated via soldier-in-the-loop simulations being conducted simultaneously between the Unit of Action Maneuver Battle Laboratory at Fort Knox and CERDEC NVESD.

The Objective Force Task Force arranged for Secretary of Defense Donald Rumsfeld's Welch Commission to receive a summary and a briefing on Objective Force Doctrine Organization Training Material Leadership Personnel and Facility.

The next Portal opportunity was the Virtual Distributed Laboratory for Modeling & Simulation First Application Exercise, involving multiple sites networked together in an integrated simulation focused on Unit of Action Networked Fires, led by the Aviation and Missile Research, Development and Engineering Center at Redstone Arsenal, Ala., and RDECOM elements from across the nation.

During the exercises and VIP demonstrations, which drew approximately 200 attendees over three days, the CERDEC NVESD technical staff and soldiers supported a simulation of a FCS Reconnaissance and Surveillance Vehicle with technologies from the Networked Sensors for the Objective Force Advanced Technology Demonstrator via the Portal.

In July, the Portal, in collaboration with RDECOM and TRADOC, participated in the Joint Forces Command Distributed Continuous Experimentation Environment Integrated Connectivity Test, a technical test between 14 distributed Tri-Service and DoD agency sites, and involving RDECOM's CERDEC Belvoir, AMRDEC, Army Research Laboratory, and ARDEC. The JFCOM and its Joint Experimentation Directorate Joint Futures Lab (J9) is the epicenter for joint transformation of operations and doctrine. While the connections had some difficulty, this is the first time an effort with multiple services has tried to connect and cooperate in a joint simulation and events of this type can be expected in the future.

The Portal has been a success, providing an opportunity to witness and participate in live distributed simulations from a convenient location. As technology improves and the Army expands simulation to support research and concept development, CERDEC personnel anticipate that more events will be hosted with even greater attendance. The NCR Portal provides a venue for national leadership to observe, experience, interact with and influence in those developments.

New commander welcomed at Soldier Systems Center

U.S. Army Soldier Systems Center

NATICK, Mass. – The Soldier Systems Center welcomed its new commander during a ceremony in Hunter Auditorium Oct. 10.

Col. David Bongi was introduced to the work force as the installation commander and acting deputy commanding general for Operational Readiness for the U.S. Army Research Development and Engineering Command.

Bongi replaces Brig. Gen. Craig Peterson, who served as deputy commanding general for Homeland Operations and installation commander since July 2002. Bongi was assigned to the Soldier Systems Center last March as director of security for Homeland Operations before taking his new position. Homeland Operations transferred to Forces Command and will no longer be represented at Natick.

The details of the RDECOM position still need to be finalized with RDECOM headquarters and the Army Materiel Command, but Peterson said the position will focus on providing integrated and responsive technologies and support to current military operations, and to quickly adapt advanced or near-term technologies into military systems.

"I feel privileged to be here. I will always be here for you," Bongi said during his comments. "We have a bright future ahead of us."

Peterson worked with Bongi in a previous assignment in Korea, and had high praise for him.

"I've watched him shine wherever he's gone. I'm confident and feel very, very comfortable in his ability," Peterson said. "If I had the choice and the power, I can think of no one else I'd want to see here than Colonel Dave Bongi."

Peterson spoke for several minutes about the changes that have taken place and continue to happen at the installation and in the Army, noting the "only thing that remains constant is change." He explained the movement of leadership for the garrison and its importance.

He also reminded those in attendance the importance of the work done at Natick.

"I think you have the most important jobs in supporting the Army. Nowhere else do we have immediate and personal impact on all of our Soldiers," Peterson said.

ARL Soldier wins Director's Research Initiative Award

By Tonya Johnson, ARL Public Affairs Office

ADELPHI, Md. – Master Sgt. Lamar Garrett was one of the recipients and the only Soldier awarded an Army Research Laboratory Director's Research Initiative Award for FY 04.

His research focus is on the effects of encapsulation on dismounted warrior performance. Performance data relative to mobility, survivability, and information management technology capabilities will be used to determine and select methodologies for further research of encapsulation effects on current Nuclear Biological and Chemical Protective Equipment, Land Warrior, and Scorpion (Objective Force) Soldier systems.

The goal of the research is to provide additional information of warrior performance to the Army, other DoD agencies, and non-government agencies. Garrett also hopes his project will help guide the design of future dismounted warrior systems.

Garrett's project begins Nov. 3 with a two-week pilot study of six Soldiers testing the Soldier ensembles. The two-week study will begin in late January with 12 Soldiers testing the ensembles four to six hours a day in an outdoor environment doing individual moving techniques such as walking or running, negotiating an obstacle course, and performing shooting exercises. The project is expected to take nine months to complete.

"The Army has a limited amount of information regarding the effects of encapsulation," said Garrett, a research non-commissioned officer in the Human Research and Engineering Directorate. "This information is critical to achieving effective mission performance as well as survivability of future dismounted Soldiers of the Objective Force."

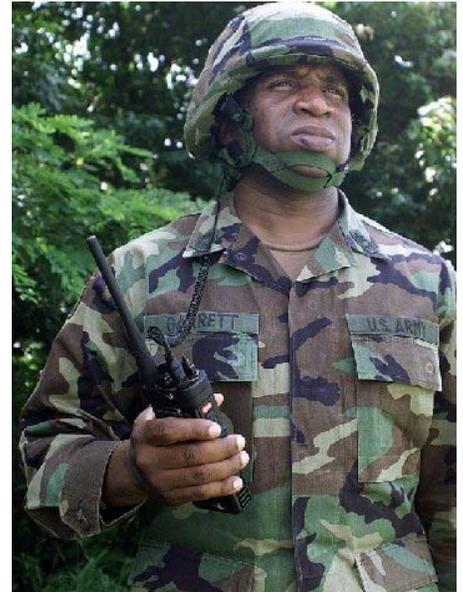
Dr. Allen Grum, facilitator of the program, called Garrett's proposal "impressive."

"It will give some understanding how a Soldier can operate with all of his gear in a chemical and biological environment," Grum added. "It was a pertinent proposal that will provide valuable information."

Garrett said the main concerns expressed by Soldiers wearing various individual combat equipment ensembles in the field involve design integration, its impact on mission performance, and comfort.

"Although research has been conducted on individual items of combat equipment and various components of dismounted Soldier systems, very little performance-based research has been performed using a system of systems approach," Garrett said.

Only 14 proposals submitted by individuals or groups of individuals were chosen out of the 83 proposals that made it to the selection board. The DRI program's objective is to stimulate high risk, innovative research that is based on technical merit. The program allows the ARL director to encourage research in areas that offer outstanding potential. The history of the program dates to 1993 when then-ARL Director Dr. John Lyons established a budget to fund innovative research.



Master Sgt. Lamar Garrett was the only Soldier awarded an Army Research Laboratory Director's Research Initiative Award for FY 04.

"It's a competitive program because the award allows the researcher to do research in areas that he or she may not be able to do within the normal research program," Grum said. "This is promising research that perhaps can be implemented later in our regular research program."

Natick Soldier Center wins prestigious Army award

U.S. Army Soldier Systems Center

NATICK, Mass. – For the second time in three years, the Natick Soldier Center at the U.S. Army Soldier Systems Center has been selected Department of the Army Research and Development Laboratory (Small) of the Year.

Evaluation committee members reviewed Army organizations using the rigorous standards that would be applied to commercial research and development centers or academic institutions. Unlike previous years, in which organizations voluntarily competed, every Army research and development organization was required to submit a nomination for the 2003 competition.

"You had to be really good to win. The committee had a high bar that an organization had to exceed to be considered as a candidate for the win," Philip Brandler, NSC director, said during a town hall meeting with the NSC work force Sept. 12. "This competition is also part of a larger process to evaluate all the Army research and development organizations. I'd like to see NSC winning the competition become a regular event."

Eight organizations fall into the Department of the Army's small category, each with no more than 700 employees. NSC has about 500 employees.

Selection for the most prestigious award the Army bestows upon a research and development organization is based on extensive evaluation of the organization's vision, strategy, and business plans; technical accomplishments, such as technology breakthroughs, rapid improvements for troops, transition of technology and impact on customer satisfaction throughout the Department of Defense; resource use, including professional certification and development of technical staff, state-of-the-art facilities and equipment, and process improvements.

Organizations each submitted a written document and then each organization's director presented summary addressing competition criteria before an evaluation committee with senior representatives from the Office of the Assistant Secretary of the Army for Acquisitions Logistics and Technology, Office of the Secretary of Defense, National Defense University, National Academy of Engineering, Lawrence Livermore Labs, Massachusetts Institute of Technology, Korn/Ferry International, E.I. DuPont, General Electric and NEC Research Institute.

Brandler addressed NSC's core capabilities: Soldier-related technology generation, application, and transition enabling rapid fielding of the right equipment; Soldier systems technology integration and transition; and solving Soldier-related field problems rapidly.

He provided specific examples that demonstrated the NSC's accomplishments in each of its core capabilities, such as new breakthroughs in fiber research and nanotechnology and providing "on the ground" support and technical solutions to deployed forces, all designed to ultimately improve the survivability, combat effectiveness and sustainability of the Soldier.

He focused on NSC's major technical accomplishment in developing the Scorpion, a combat specific Soldier platform that provides a protective head-to-toe ensemble for the Army's premier Soldier technology effort, Objective Force Warrior.

Brandler highlighted the vigorous growth in scientific and engineering staff, the high quality of the new staff as well as the commitment to self-improvement of the existing staff, emphasizing the critical importance of the human capital that drives the organization's success.

ARL engineer helps establish, strengthen engineering programs

By Tonya Johnson, ARL Public Affairs Office

HAMPTON, Va. – Yolanda Hinton is probably exhausted, but she won't admit it.

"She's dedicated, and when she works on a project, she works it enthusiastically," said Dr. Wolf Elber, Hinton's boss and director of the Army Research Laboratory's Vehicle Technology Directorate at the NASA Langley Research Center in Hampton, Va.

Hinton, a mechanical engineer with VTD, recently returned to her job after spending more than two years in a developmental assignment at Norfolk State University in Virginia, to help the university, which receiving professional accreditation from the Accreditation Board for Engineering and Technology in the undergraduate electronics and optical engineering programs.

"The U.S. faces a severe shortage of scientists and engineers," said Hinton, who has worked for ARL since it was formed in 1992. "We comprise less than 5 percent of the work force, yet make enormous contributions to the U.S. quality of life, economy, and security. We are an aging population and we need young scientists and engineers to carry on as we retire."

In addition to helping the two undergraduate programs receive accreditation, Hinton helped develop curricula for the bachelor's degree in optical engineering and master's degrees in both optical and electronics engineering, and revise the undergraduate electronics engineering curriculum. She wrote proposals to get approval for the programs from the State Council for Higher Education in Virginia, and helped recruit faculty and students, procure lab equipment, and develop partnerships with other universities and research laboratories.

Hinton also accompanied students to conferences and served as faculty advisor to the university's chapter of the National Society of Black Engineers. Hinton hopes that some of the students will intern with ARL or work with the laboratory after graduation.

"I saw (this) as an opportunity to have a direct impact on the lives of the students and to help them achieve their dreams," Hinton said. "There are some bright, hard-working, and highly-motivated students aspiring to become the next generation of scientists, engineers, explorers, and discoverers. The future looks bright."

Norfolk State University, founded in 1935, is one of the largest historically black colleges and universities in the nation. More than 7,000 students from across the United States and abroad attend the university.

Roger Hathaway of the Office of Education at the NASA Langley Research Center asked Elber if he knew of any scientists and engineers who would be willing to help build the university's engineering program after the director from the Center, Dr. Samuel Massenberg, met with Dr. Marie McDemmond, president of Norfolk State.

"I told him 'I think I may have the person you need' and I immediately asked Yolanda if she was interested," said Elber. "This opportunity allowed her to expose the students at Norfolk State to another career avenue and also allowed her to mentor future scientists and engineers."

Now that she is back at VTD, Hinton is working in the Mechanics and Durability Branch developing ways to monitor the health of structures, particularly lightweight, robust multifunctional structures being developed for a variety of uses,



Yolanda Hinton, an Army Research Laboratory mechanical engineer, helped the engineering program at Norfolk State University to receive professional accreditation.

including ground, aviation, and space vehicles. But she will continue to look for opportunities to collaborate with the faculty and students in areas of research at the university, promote the university and its accomplishments, and recruit faculty and students.

“The students have helped to re-energize me and re-ignite my scientific curiosity,” said Hinton. “My time at Norfolk State was a welcome change from research and opportunity to work in an academic environment. I have often thought about academia as a second career once I leave federal employment. I’m sure now that’s what I want to do.”

Hinton, who holds bachelor’s and master’s degrees from MIT, is a fellow of the Acoustic Emission Working Group. She was recognized by the National Technical Association as one of the Top Women in Science in 1997. She is involved in the Tidewater Chapter of Tuskegee Airmen, Inc., National Technical Association, Black Alumni of MIT, her church, and the Speakers Bureau at NASA Langley.

ECBC representative serves on awards panel

ECBC

ABERDEEN PROVING GROUND, Md. – Dr. George Famini served as a judging panelist for the Division of Computational Chemistry Symposium at the 226th American Chemical Society meeting in New York City Sept. 9.

Famini, chief of the U.S. Army Edgewood Chemical Biological Center's International Division, was one of six judges on the panel who reviewed papers and selected one representing the most significant achievement in new computational technology at the symposium, "Emerging Technology in Computational Chemistry. Famini has served as a panelist for three of the four years this symposium has been held. Schrodinger, Inc., sponsored the symposium and provided a \$1,000 prize for the winning author.

Five employees honored for support to small business

By Peter Rowland, ARDEC Public Affairs Officer

PICATINNY ARSENAL, N.J. - Five Armament Research, Development and Engineering Center employees recently were recognized by the Army for helping to put innovative ideas into the hands of Soldiers.

The ARDEC employees assisted three 2003 Army Small Business Innovation Research Phase II Quality Award winners. Acting Deputy Assistant Secretary of the Army for Research and Technology Dr. Thomas Killion presented plaques to Dr. Paul Willson, Edward Cuda, Carol L'Hommedieu, Stanley P. Kopacz, and Grunde R. Haugeto acknowledging their efforts.

ARDEC sponsored three of the six winning companies awarded SBIR Phase II Quality Awards. Thirty-two companies were nominated.

The award is presented annually to exceptional projects that complete the research and development phase of the SBIR program, and recognizes companies that exemplify the goal of bringing innovative technologies and products developed by small businesses to the marketplace.

Hi-Z Technology Inc. was recognized for developing a lightweight thermoelectric power source that produces two watts of power for 22 days using two pounds of fuel. Surface Optics Corp. also received the award for developing extremely fast application-specific processing chips for hyperspectral imaging. QED Technologies received its award for developing a breakthrough technology called subaperture stitching interferometer for use in fabricating advanced optics.

ARDEC also was recognized during the ceremony.



Admiring a plaque that each was presented are, from left, Dr. Paul Willson, Edward Cuda, Carol L'Hommedieu, Stanley P. Kopacz and Grunde R. Haugeto. Photo by Peter Rowland.

Laptop designed for desert use will increase Soldier safety

By Myra Hess, ARDEC Public Affairs Office

New logistic software has been developed at Picatinny Arsenal, N.J., in a joint program with the Combined Arms Support Command in Fort Lee, Va., the Logistics Transformation Agency in Fort Belvoir, Va., and contractor 21st Century Technologies, located in Austin, Texas.

The computer application, "Configured Load-Building Tool," has been installed in 16 laptops that have been hand-delivered to Soldiers at Fort Lewis, Wash., for fielding with the Stryker Brigade deploying to Iraq.

"These laptops are not typical," said Al Santucci, project management engineer in the Logistics R & D Activity. "They've been designed for desert use."

ARDEC's Santucci and representatives from 21st Century Technologies traveled to Fort Lewis recently to train the Soldiers of the 3/2 296th Brigade Support Battalion and the 44th CSB to use the CLBT prior to their deployment.

The initial operating capability prototype, designed by 21st Century Technologies, "is a simple, user-friendly, interactive and visually oriented software tool designed to carry out the basic steps in planning and re-configuring a well-designed load," according to a 21st Century Technologies data sheet. The full operational capability will be delivered in 2005.

The software program will enable users to design the optimal configuration of required classes of supply for distribution to/from the user on any distribution platform/conveyance in accordance with transportation regulations. The CLBT automatically accesses a pre-designed load or designs a new load that is optimal within the capacity constraints of the platform and conveyance, including factors such as volume, weight and the center of mass.

Through maximized load balancing on all conveyances and trucks, Soldier safety will be increased, and distributing supplies to the warfighter will be simpler, more efficient and more economical.



The software program "Configured Load-Building Tool" is displayed on a Panasonic Toughbook 28 Laptop computer, one of 16 that will be deployed to Iraq with the Stryker Brigade. Photo by Todd Mozes.

New lighter, rechargeable batteries for Soldiers

CERDEC

Soldiers who use non-rechargeable batteries soon will have a lighter, less expensive, better-performing rechargeable option, thanks to the efforts of Communications-Electronics Research, Development and Engineering Center's Command and Control Directorate, Army Power Division and Logistics Readiness Center engineers.

The team awarded a five-year production contract for the new BB-2590 lithium ion battery to replace the BB-390 and possibly the BA-5590 lithium non-rechargeable batteries.

The new BB-2590 batteries, which can be recharged more than 500 times, weigh a pound less than their predecessors and are scheduled for delivery in December 2003. They are used in more than 75 types of equipment, including SINCGARS and Javelin M22 (Acada). For additional technical and customer service support for these new batteries, call (732) 427-4886.



New magazine reaches NBC community

NBC International is a new magazine for the NBC community sharing international best practice information. According to NBC International Editor Gwyn Winfield, it is designed to provide leading information on issues such as fourth stage decontamination and bio-terrorism.

Published twice a year, the magazine aims to be a voice of the international NBC community. The current edition, with interviews with Brig. Gen. Steve Reeves and Col. Andy Pedder (the UK NBC IPT), is out now and you can receive your free copy by emailing the publisher - gwyn.winfield@surreyhouseuk.com. This will make you eligible for further free issues of NBC International, which explores such topics as "NBC Training – time to face up to reality?" and "Marine NBC – dangers in the surf".