

THE INSIDER

INSIDE THIS ISSUE

DIRECTOR'S CORNER

Embrace the coming changes, Page 2

DCG EXITS RDECOM

McGuinness says goodbye to Natick, RDECOM, Page 3

RDECOM NEWSBRIEFS

News and information from across the organization, Page 4

FORSKOM SENIOR NCO EXPLORES SCIENCE SUPPORTING SOLDIERS

Command Sgt. Maj. Darrin Bohn tours RDECOM, Page 9

ARMY ANNOUNCES GREATEST INVENTIONS

2011 accomplishments set to be recognized, Page 10

TECH DIRECTOR SPOTLIGHT

Meet Jill Smith from CERDEC, Page 12

ARMY EXCHANGE PROGRAM ENHANCES ENGINEER'S CAREER

ECBC scientist goes 'down under,' Page 14

SCIENTIST PROTECTS AGAINST CHEMICAL WARFARE AGENTS

ECBC chemist starts career, Page 16

'WHERE'S THE BEEF?' -- DOD FINDS ANSWERS IN NEW FOOD PROCESS

Meat product uses an innovative dehydrating process, Page 26



U.S. Army Research, Development and Engineering Command Director Dale Ormond (left) passes the Natick organizational colors to Dr. John P. "Jack" Obusek during a Sept. 14 change-of-responsibility ceremony at Natick, Mass. (U.S. Army photo by David Kamm)

Obusek takes the helm at Natick

By Bob Reinert
USAG-Natick Public Affairs

NATICK, Mass. — Dr. John P. "Jack" Obusek became interim senior manager of Natick Soldier Systems Center in a Sept. 14 change-of-responsibility ceremony.

Obusek, also director of the Natick Soldier Research, Development and Engineering Center, replaced Brig. Gen. John J. McGuinness, who becomes Program Executive Officer, Ammunition, and commanding general at Picatinny Arsenal, N.J., after 16 months at Natick.

Dale A. Ormond, director of the U.S. Army Research, Development and Engineering Command, hosted the ceremony in NSSC's Hunter Auditorium.

"Organizations reflect the standards, the expectations and behavior of whoever is in charge," Ormond said. "I have every confidence that under the leadership of Jack Obusek, at least in the interim, you will

continue to provide the same sort of support that you have given to John McGuinness."

Ormond pointed out that Obusek had served 27 years on active duty in the Army and retired as commander of the U.S. Army Research Institute of Environmental Medicine at NSSC.

"Installing Jack as the interim senior manager also goes to show how some of the roles of our civilians have changed over time, especially the last 10 years in the Army," Ormond said. "Civilians have been much more engaged in this fight than probably any fight in the history of our Army."

Obusek vowed to continue NSSC's tradition of excellence.

"I'm honored and humbled to be selected, and I pledge to you to serve you the best that I can in that leadership role," Obusek said. "I'll do my very best to provide that."

Calling him "a tremendous leader," Ormond

CONTINUED ON PAGE 32

Director's Corner: Embrace the coming changes

By Dale A. Ormond
RDECOM Director

I've talked in a lot of different venues recently about the need for RDECOM to transform to not only remain relevant, but to be a leading influence on the future of our Army. As many of you know, we have commissioned several Internal Process Teams with representatives from all the centers and labs to study how we operate and to plan this transformation. We've also focused the headquarters team on this effort. I'm happy to report that we are moving more forcefully from the studying and planning phase into the execution phase.

We started with the headquarters. Last month, I announced a realignment of the headquarters. I say realignment instead of reorganization because from the beginning we have been following a very deliberate path: establish our lines of effort, set goals for each, draft campaigns to achieve those goals, and then realign our people and our resources to carry out those campaigns. The headquarters realignment is our first big step in that direction.

These changes may not seem earth-shattering from the outside. One of our challenges is the relatively small size of the headquarters staff, so we can't move hundreds of people or even make several moves involving dozens of people. This said, we have made some changes that will streamline our operations so we can better support our centers and labs as

"Safety is my top priority and we will put more resources behind it."

— Dale A. Ormond

well as the rest of the Army science and technology community.

One change that will affect everyone is a more robust, more active safety effort. Safety is my top priority, and we will put more resources behind it. In the personnel and resource management areas we will work smarter and capitalize on the natural synergy between those two areas by combining them into one directorate.

Our G3 shop will be more tightly focused on the traditional G3 role of supporting our troops in the field and other external partners.



U.S. Army Research, Development and Engineering Command Director Dale A. Ormond (right) speaks at a Sept. 12 board of directors meeting at West Point, N.Y. (U.S. Army photo by David McNally)

G5 will be expanded slightly so we can have one directorate tracking our overall strategy to how we communicate the strategy to the planning and execution of the events that arise out of those activities.

These changes will help the headquarters do what a headquarters should: support the rest of the team. You will see a growing emphasis on customer service, and if you don't, please let me know!

We will also work overtime to get the message out. I am planning a series of town halls in the coming months. I will visit each center and lab to explain where the team is going and to get direct feedback from you.

This is a critical part of the transformation process, and frankly I wish I could have gotten to it sooner. The truth is, when I arrived the headquarters, the command and the entire Army science and technology community was under a fair amount of scrutiny.

The RDECOM team is already doing

world-class work. Far too few people know and appreciate who is responsible for the peerless technology our Soldiers enjoy. As a result, educating to our partners and decision makers outside of RDECOM has consumed a lot of my time. It will continue to be important, but I will soon have the more time to dedicate to talking with the team as we work through this transition.

You can also look forward to hearing from our other senior RDECOM leaders as they champion our lines of effort, which they helped to craft.

All of the command's senior leaders share ownership of this new direction, so you can look forward to hearing about it from all of us. I know I look forward to talking to each of you about it. Until then, I appreciate the excellent work you are doing for our Soldiers and our Army.

Army Strong!

RELATED LINKS

Biography: <http://go.usa.gov/vK8>

Facebook: <http://on.fb.me/MKsWlo>

Twitter: <http://twitter.com/DaleOrmond>

McGuinness says goodbye to Natick, RDECOM

By Bob Reinert
USAG-Natick Public Affairs

NATICK, Mass. — He was a Yankees fan in Red Sox territory, a longtime infantryman operating in the world of Army research and development.

Still, Brig. Gen. John J. McGuinness left an indelible mark on Natick Soldier Systems Center in his 16 months as its senior commander, which came to an end with his Sept. 14 change-of-responsibility ceremony. Dr. Jack Obusek will take over for McGuinness, who moves on to become Program Executive Officer, Ammunition, and commanding general at Picatinny Arsenal, N.J.

“What the workforce has done in a year has been phenomenal in terms of awards, the support to Soldiers, the collective feeling of collaboration,” McGuinness said. “I had in my mind a certain ... high standard of what I expected from the civilians here. By and large, they’ve totally exceeded that.”

His relatively short tenure here featured an extraordinarily large number of highlights, including visits by Secretary of the Army John McHugh, Heidi Shyu, Acting Assistant Secretary of the Army for Acquisition, Logistics and Technology, and congressional staffers.

“Every time we have a visitor come through and we take him or her to different organizations,” said McGuinness, “they get the same message of collaboration, not only within the installation, but also with industry and academia.”

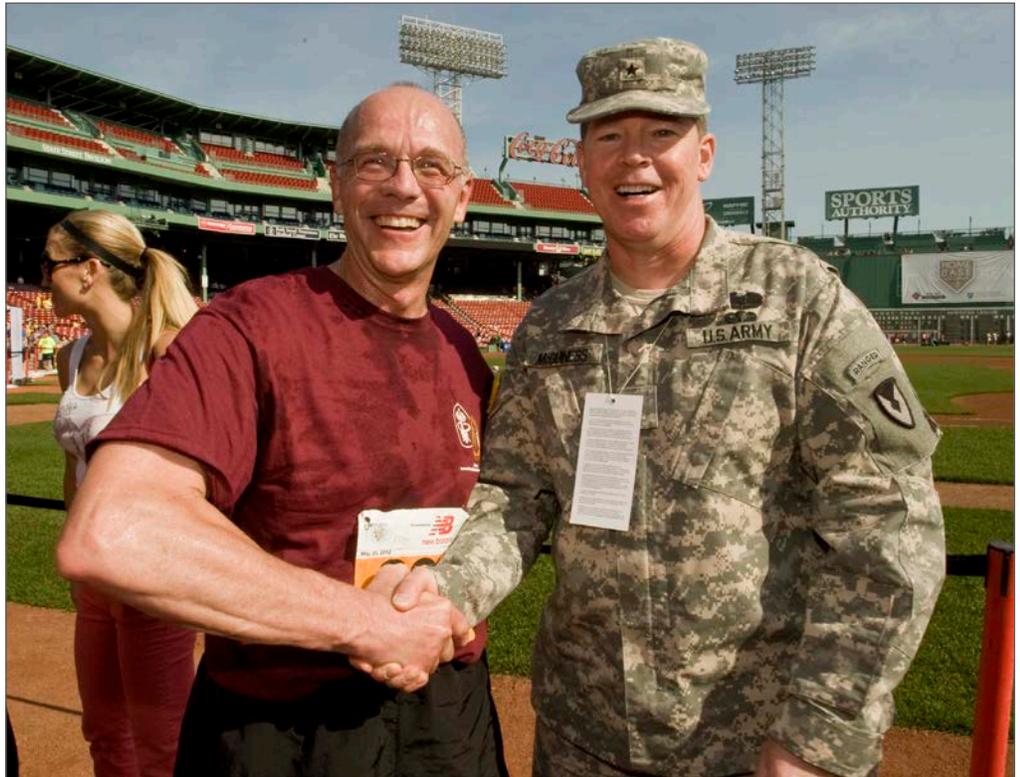
On May 10, 2011, McGuinness arrived at Natick to become the first general officer to reside here full time in eight years. Though he was often TDY as U.S. Army Research, Development and Engineering Command deputy commanding general, he still managed to visit all six New England states.

“That was my mission,” said McGuinness, who has a bookcase in his office filled with New England memorabilia. “It’s been fantastic. The people have been absolutely amazing.”

No matter where he went, McGuinness tirelessly told the Natick story.

“We weren’t going to be quiet,” McGuinness said. “Natick has a great story to tell. It’s a story not about things, but of the people and the contributions of the workforce here to the joint force, the joint war fight, what that has been and what that will be in the future. I keep telling the folks here that we haven’t even stepped it up yet.”

McGuinness said that each day he came



Brig. Gen. John J. McGuinness (right) greets Col. Gaston Bathalon May 20, 2012, at the finish line of the Run-Walk to Home Base at Fenway Park in Boston. McGuinness, former senior commander of Natick Soldier Systems Center and U.S. Army Research, Development and Engineering Command deputy commanding general, turned over responsibility for NSSC Sept. 14 to Dr. Jack Obusek. (U.S. Army photo by David Kamm)

through the gate at NSSC, he tried to view the installation through the same lens as its workforce, not as its senior commander.

“If I am a worker at Natick ... what has to happen for this place to improve?” McGuinness said. “Every day I thought about what we could do here collectively to improve the working conditions, the living conditions, of this installation. And so that’s what I try to go by.”

McGuinness pointed to upgrades made to the physical plant at Natick.

“Like I told the Secretary of the Army, we have world-class employees, we demand world-class research, and we put folks in third-world ... offices and labs, and that’s not right,” McGuinness said. “So we’ve gone about being able to make the facilities a little bit better. We’re continuing to do that.”

McGuinness returns to Picatinny, where he previously served as Infantry Systems Officer and as Assistant Product Manager (Mortars).

“I’m an infantryman, and so my assignments, up to that point, had been all Soldier oriented in the sense that I had been in infantry units -- not on a staff but leading Soldiers at the very basic level,”

McGuinness said. “And I did that for a long time as a platoon leader and as a company commander.”

At Picatinny, McGuinness, a U.S. Military Academy graduate who served combat tours in Iraq and Afghanistan, learned to work with civilians.

“It forever changed my perception ... of civilians,” McGuinness said. “I was just floored by the quality of civilians that were there.”

McGuinness said he also found high-quality civilians at Natick, though they greeted him with a Bronx cheer in his first town hall, when he announced that he was a Yankees fan.

“But since then, I’ve run into a lot of Yankee fans,” said McGuinness, who likely will meet many more in New Jersey.

“I’m just really happy that I had an opportunity to be stationed here,” McGuinness said. “Both (my wife) Gail and I were very, very happy. It’s just been great. I really enjoyed it.

“I hope that I made a difference here.”

RELATED LINKS

Farewell Dinner: <http://bit.ly/SxtNxs>



Tanya Lynch earned the Achievement Medal for Civilian Service for outstanding performance July 2011 through July 2012, while serving as a member of the RDECOM Namer Capability Assessment Program Team, in support of the Ground Combat Vehicle Analysis of Alternatives.



Frances R. Parker earned the Achievement Medal for Civilian Service for outstanding performance September 2007 through August 2012, while serving as a Financial Management Analyst, RDECOM. Parker served as a command lead for the implementation of the General Funds Enterprise Business System.



Rebekah Backhaus earned the Achievement Medal for Civilian Service for outstanding performance September 2007 through August 2012, while serving as a Financial Management Analyst, RDECOM. Parker served as a command lead for the implementation of the General Funds Enterprise Business System.

RDECOM Newsbriefs



Dr. Bryan Cheeseman earned the Achievement Medal for Civilian Service for outstanding performance July 2011 through July 2012, while serving as a member of the RDECOM Namer Capability Assessment Program Team, in support of the Ground Combat Vehicle Analysis of Alternatives.



David Lynch earned the Achievement Medal for Civilian Service for outstanding performance during the period July 2011 through July 2012, while serving as a member of the RDECOM Namer Capability Assessment Program Team, in support of the Ground Combat Vehicle Analysis of Alternatives.



David Hackbarth earned the Achievement Medal for Civilian Service for outstanding performance during the period July 2011 through July 2012, while serving as a

member of the RDECOM Namer Capability Assessment Program Team, in support of the Ground Combat Vehicle Analysis of Alternatives.



Annmarie Martin earned the Achievement Medal for Civilian Service for outstanding performance May through June 2012, while serving in the International Technology Integration Division, Programs and Engineering, RDECOM. Martin led the effort to develop a series of successful strategic engagements between the Director of the Command and senior leaders in the United Kingdom and France.



Kimberly Ables earned the Commander's Award for Civilian Service for outstanding performance for her service March through August 2012, while in transition from the command protocol officer to a command events specialist for RDECOM.



David DuBravec earned the Achievement Medal for Civilian Service for outstanding performance January through August 2012, while serving as an RDECOM assistant

inspector general. DuBravec has embraced the "esprit de corps" and provided outstanding support.

while serving as an RDECOM assistant inspector general. Kelly has embraced "esprit de corps" and provided outstanding inspector general support to the Soldiers and civilians of the Command, AMC, and the U.S. Army.

CFC is under way

RDECOM Public Affairs

ABERDEEN PROVING GROUND, Md. — The annual Combined Federal Campaign is under way.

Dale Ormond, director of the U.S. Army Research, Development and Engineering Command, encouraged his workforce to participate in the annual charity drive.

"Focus on your local community. I encourage you to look for agencies that are in your local towns. They give services to the people with whom you live. They are incredibly effective," Ormond said during an RDECOM headquarters town hall meeting at the Ball Conference Center Sept. 17.

APG is part of the Chesapeake Bay Area campaign, which runs through Dec. 15. The region raised \$6.8 million in 2011 and has set a goal of \$7 million for this year.

The Chesapeake Bay Area CFC has 1,486 local non-profit organizations and more than 2,500 national and international organizations. Only those organizations that an employee designates will receive the gift, no others.

Ormond said he has worked with the CFC for several years and is a "huge proponent" of the organization. He shared a personal story with the RDECOM employees about his interaction with the agency director of Therapeutic Childcare, which provides care for neglected and abused children.

"A little girl, about 4 or 5 years old, came in. One of the things they would do to assess the child was to give the child a whole bunch of crayons and paper and ask them to draw a picture," Ormond said. "With neglected and abused children, they would only color with red and black. From a psychologist's perspective, it's obviously challenging.

"After working with this child for a year, the agency director, Peggy, did the same test. The child drew a picture of a yellow sun, green grass, trees and a house. The child looked up at Peggy and said, 'Now I can use all the colors of the rainbow.' This is the high impact that these places can have."

Federal employees can contribute through payroll deduction, check, credit card or debit card.

More than 91 cents of every dollar goes to the designated organization, and the campaign's administrative costs are about 3 percent below the national average, according to the CFC web site.

For more information, go to <http://www.cbacfc.org> or contact the RDECOM representative, Mike Bennett, at michael.bennett3.civ@mail.mil or 410-278-9049.



Cristina Biesecker earned the Achievement Medal for Civilian Service for outstanding performance during 1-9 March 2012, while serving as a Technology Integration Specialist, in the RDECOM Classified Programs Office. Biesecker volunteered to lead a security investigation.



RDECOM Deputy G3 Gary Gerst earned an award for 40 years of federal service.



Eddie Ansell earned the Achievement Medal for Civilian Service for outstanding performance May through June 2012, while serving in the International Technology Integration Division, Programs and Engineering, RDECOM. Ansell led the effort to develop a series of successful strategic engagements between the RDECOM director and senior leaders in the United Kingdom and France.



Cristina Biesecker earned an award for 40 years of federal service.

RELATED LINKS

View all the photos from the Sept. 17 RDECOM Town Hall meeting: <http://bit.ly/SAGHpJ>



Keyla Kelly earned the Achievement Medal for Civilian Service for outstanding performance during the period January - August 2012,



Brian May received the Commander's Award for Civilian Service for the period January 2009 - September 2012 while serving as paralegal and freedom of information act officer at RDECOM. His professional performance and exemplary legal support provided essential and timely assistance to the Chief Counsel Office and other U.S. Army organizations.

RDECOM director addresses issues at town hall

By Dan Lafontaine
RDECOM Public Affairs

ABERDEEN PROVING GROUND, Md. — Dale Ormond, U.S. Army Research, Development and Engineering Command director, discussed several topics during a headquarters town hall meeting at the Ball Conference Center Sept. 17.

SUICIDE PREVENTION

Ormond encouraged employees to participate in suicide-prevention events during the next few weeks. He emphasized that it is important for Soldiers and civilians to look after their co-workers.

“It’s a very serious issue for our Army. I was not entirely aware of how many civilians have also committed suicide over the last couple of years,” he said. “There is tremendous pressure on all of our employees with the operational tempo, the potential for downsizing, and all the other issues we’re going through.

“If you see one of your fellow workers who you think might have an issue, make sure you let your boss know about it so we can get them the help they need.”



RDECOM Director Dale A. Ormond addresses the staff at a Sept. 17 town hall meeting at Aberdeen Proving Ground, Md. (U.S. Army photo by Conrad Johnson)

VIRTUAL LNO STAFF

Ormond discussed designating two or three employees at each RDECOM research center to serve as virtual staff to the headquarters, particularly to the

programs and engineering department.

AUSA ATTENDANCE

Because of new restrictions on Army conferences, attendance at the Association of the United States Army Annual Meeting in Washington in October is limited.

“[Army Materiel Command] is allowed to send only about 28 people. That’s 28 people out of about 50,000. I’d like to have a van go in the morning and come back the same day. I think it’s important for those of us who are doing S&T and RDT&E to get a chance to walk the floor, talk to vendors, and get a sense of what the state of the art is.”

DEPUTY COMMANDING GENERAL

Brig. Gen. John McGuinness relinquished the senior leader role Sept. 14 at Natick Soldier Systems Center to John Obusek, director of the Natick Soldier Research, Development and Engineering Center. McGuinness becomes Program Executive Officer, Ammunition, and commanding general at Picatinny Arsenal, N.J.

Brig. Gen. Daniel Hughes begins Nov. 1 as RDECOM’s new deputy commanding general. His duty station will be APG.

RDECOM leaders discuss way ahead at BOD

RDECOM Public Affairs

WEST POINT, N.Y. — The U.S. Army Research, Development and Engineering Command gathered its senior leadership at the U.S. Military Academy Sept. 12 for a Board of Directors meeting.

The group discussed the way ahead in Army research and how to improve collaboration and sharing in the organization. RDECOM is responsible for using technology to empower, unburden and protect America’s Soldiers.

“One reason we had this meeting at West Point was so that the technical directors at each of the RDECs and ARL got a chance to see what the academy is working on, and to get a chance to meet some of the faculty,” RDECOM Director Dale A. Ormond said. “It helps to foster relationships where we can think about projects we may be able to do with West Point cadets next summer.”

Board of Directors meetings are held frequently to ensure clear communications across the organization and to enhance integration efforts in Army research and development.



Communications-Electronics Research, Development and Engineering Center Military Deputy Col. William Hoppe makes a point at the RDECOM Board of Directors meeting Sept. 12 at West Point, N.Y. (U.S. Army photo by David McNally)

U.S. Military Academy seeks to enhance science, technology ties with RDECOM

By David McNally
RDECOM Public Affairs

WEST POINT, N.Y. — The U.S. Military Academy educates and trains future Army leaders. The school produces 19 percent of the Army's officers each year, but officials said they account for 75 percent of those with STEM degrees -- Science, Technology Engineering and Mathematics.

PARTNERSHIP

The school partners with the U.S. Army Research, Development and Engineering Command for internships, funding and special projects. Leaders from across the Army's technology command met at the school Sept. 11, to discuss enhancing their partnership.

"As what we give to Soldiers becomes more technologically complex, it becomes even more important that officers have a strong foundation in math, science and engineering to understand the basis for these systems," said RDECOM Director Dale A. Ormond. "As you increase the technical complexity of the equipment you use, it's very important to have technical competence."

Military and civilian leaders from across RDECOM used West Point facilities to conduct a board of directors meeting. They also received briefings from school faculty, classroom tours and met with cadets interested in science and technology.

"What I've been really impressed with during this visit is that Mr. Ormond gets it," said Col. John Graham, USMA associate dean for research. "His tech directors have, by themselves, formed relationships with my scientists, so his command has through personal relationships, through professional relationships, strongly tied into West Point. So that's not new. What's new is Mr. Ormond being here saying, 'Hey, I want the tech directors to work together and see if we can find the way to bring this to the next level.'"

POTENTIAL SCIENTISTS

The academy produces leaders and thinkers. In class, cadets learn skills necessary for tomorrow's Army.

"I had the opportunity to sit in on a physics class, which by the way brought back memories," said Gerardo Melendez, Ph.D., Armament Research, Development and Engineering Center technical director.



The U.S. Military Academy's Dr. Dave Kashinski teaches cadets advanced physics Sept. 11 at West Point, N.Y. (U.S. Army photo by David McNally)

"It was very interesting to see the way they teach the curriculum with the emphasis on practical exercises."

Melendez regularly welcomes cadets for internships to his laboratories and research facilities at Picatinny Arsenal, N.J.

"What I think we can do is to get more of these students into our laboratories and help to foster these STEM degrees and appreciation for technology"

— Dale A. Ormond

"It's amazing when you look at what goes on here," he said. "You have this idea of not only shaping the mind, but the person as a whole, so the notion of technical prowess, the research that goes into it, the academics part, but also the physical aspect of the cadet."

The academy's research activities also deal with real-world challenges, which offer cadets an opportunity to contribute. For example, Cadet Jeffrey Nielsen completed a summer project developing intelligent algorithms to locate potential terrorist targets in Afghanistan and to help Soldiers find improvised explosive device weapons

caches. Nielsen is one of hundreds of future leaders finding ways to contribute today through science and technology.

"In terms of the state-of-the-art facilities, the labs and the fact that their faculty is spending a lot of their time doing research; you would normally not expect that in an undergraduate degree program like West Point," Ormond said. "From what I've seen, the cadets are very energetic, very engaged and want to know what's going on as they look to solve problems."

NEXT STEP

Ormond said the visit was an eye-opener to potential courses of action.

"What I think we can do is to get more of these students into our laboratories and help to foster these STEM degrees and appreciation for technology," Ormond said. "I would love to see some of their professors, who have Ph.D.s -- military officers, work in our labs for a couple of years, do research and come back and teach. This helps to create technical competence in their faculty, keeping them closer to the state-of-the-art. Having their students come to our labs and work gives the Army and its officers a better appreciation for what we do and how we can contribute to the fight."

RELATED LINKS

Watch on YouTube: <http://youtu.be/VTBEafe8p8Q>

USMA cadets get adventures in autonomous manipulation, mobility

By Joyce Conant
ARL Public Affairs

ADELPHI, Md. — The U.S. Army Research Laboratory's Autonomous Systems Division of the Vehicle Technology Directorate recently sponsored two U.S. Military Academy cadets for three weeks as part of their Academic Individual Advancement Development.

For more than 12 years, Raymond Von Wahlde, VTD, has mentored students from the academy on AIAD topics by providing an optional educational experience that would otherwise be personal leave for the cadet. The program provides cadets with an opportunity to observe and implement concepts from their course work over several weeks during a summer internship.

Cadets Julianne Steurer and David Crossley were tasked with designing, building, programming and operating a robotic arm using Dynamixel motors. With consultation from the advanced mobility and manipulation team, the cadets focused the project on a rapid door opening via the 'limp arm method.'

"The 'limp arm method' allows the joints of the robot arm to become passive (limp), and therefore adapt to the door's motion while the mobile base drives the action of the door, as if pulling on it with a rope," said Chad Kessens, VTD. "In this way, the robot does not need to possess or develop a highly accurate model for the door. Thus, the robot is able to open a wide range of doors both rapidly and robustly."

Pulling open a door using traditional techniques is very challenging because the motion of the door must be tracked precisely to avoid a buildup of internal forces within the system, said Kessens. He said that such forces can damage the robot, the door, or both.

As part of their project, the cadets did a lot of design work to build a virtual assembly of the robot. They printed its components on a 3D printer and assembled the robot. They also had to create a control for the robot and go through the sequence of events to put the robot into action.

"Being allowed the opportunity to work with such a knowledgeable team really opened my eyes to the possibilities and limitations of robotics," Crossley said. "Seeing robots in science fiction makes it very easy to forget exactly how much work goes into the simplest things, and the men and women who make it all possible. I learned more than I expected, and would like to thank Ray for all his patience and guidance."

Von Wahlde enjoyed working with and helping the cadets throughout the project.

"When they got the robot to open the door,



Cadets Julianne Steurer and David Crossley were tasked with designing, building, programming and operating a robotic arm using Dynamixel motors. (U.S. Army photos by Raymond Von Wahlde)

With consultation from the advanced mobility and manipulation team, the cadets focused the project on a rapid door opening via the 'limp arm method.' Shown is David Crossley viewing the robot's abilities.

you could hear them cheering," Von Wahlde said. "They were pleased, but there were also some frustrating times when things didn't go as well."

Prior to the door opening, the cadets operated the robot by moving a bolt across a table.

"The first time Julianne got the robot moving the bolt, the robot threw it across the room," said Von Wahlde. "We joked that she was trying to kill us and nicknamed her the terminator."

The project proved successful.

"Pretty impressive I think for less than 14 work days," said Von Wahlde. "They accomplished so much; I had to reorganize the project for a third cadet Stephen Peck who followed after them. And, Chad Kessens will be able to utilize the arm they constructed to conduct more door opening

experiments resulting in technical papers and publications."

Von Wahlde said that the project could not have been accomplished without the teamwork of all involved.

"I appreciate Harris Edge, (Advanced Manipulation and Mobility, team lead) allowing the cadets to come. Thanks to Jason Collins (MRI contractor on the AMM team) for providing a starting arm off which to build and the initial instructions on how to operate it, Chad Kessens for use of his door opening technique and Jason Pusey for his door design and to the carpenter shop for making us the door," Von Wahlde said.

RELATED LINKS

ARL: <http://go.usa.gov/YqDe>

FORSCOM senior NCO explores science supporting Soldiers

By Dennis Neal
RDECOM Public Affairs

REDSTONE ARSENAL, Ala. — Command Sgt. Maj. Darrin Bohn of the U.S. Army Forces Command has spent more than 30 years on active duty, including tours in Kuwait, Bosnia, Kosovo, Afghanistan and Iraq. But it wasn't until he toured the Army Research, Development and Engineering Command that he understood how scientists and engineers support the Soldier.

"The last couple of weeks ... we've traveled around throughout the United States [visiting RDECOM facilities]," he said. "It's been an eye-opening experience from how they gather things from the field and from industry, make them better and put them in the hands of Soldiers. It has been a very educational experience for me."

RDECOM headquarters is located at Aberdeen Proving Ground, Md., but the command has laboratories and facilities throughout the country. Home to more than 16,000 military and civilians, RDECOM develops technologies in its seven major laboratories and research, development and engineering centers.

"I would like to see FORSCOM get more involved with some of the technologies and sharing ideas from the Soldiers coming back from a theater of operation on how to better a piece of equipment."

— Command Sgt. Maj. Darrin Bohn

"What impressed me the most about RDECOM is the workforce. Mainly comprised of civilians, the energy, the professionalism, the pride they take in their work, never losing sight of what the end purpose is," Bohn said. "And the purpose of what they are doing is to provide the best equipment and best technologies in our Soldiers' hands in harm's way."

Command Sgt. Maj. Lebert Beharie, RDECOM senior enlisted adviser, felt the same way before he took over his position with the command.

"[Before coming to RDECOM,] I had no clue where our technology came from," Beharie explained. "When we got back and we're



T.J. Lapointe (right), Aviation and Missile Research Development and Engineering Center, demonstrates a 30 mm Apache Weapon System Laser Bore Sighter Kit to Command Sgt. Maj. Darrin Bohn, U.S. Army Forces Command. (U.S. Army photo by Tom Faulkner)

doing 'reset', we got a lot of stuff ... we just wanted to know we had the best equipment, train on it, take it to combat and bring our Soldiers home."

Beharie wanted to ensure Bohn had the opportunity to learn how RDECOM supports the Soldier and how the command could collaborate with FORSCOM.

"The Soldiers we have in this organization that advise our scientists and engineers come from [FORSCOM], and to make sure we pick the right soldiers and to have the right soldiers represent the rest of the field is absolutely important," Beharie said.

After visiting RDECOM's facilities, Bohn agreed.

"I would like to see FORSCOM get more involved with some of the technologies and sharing ideas from the Soldiers coming back from a theater of operation on how to better a piece of equipment," Bohn said. "[The Soldiers could] share those ideas and experiences



Mike Scott (left), from Armament Research, Development and Engineering Center, explains to Command Sgt. Maj. Lebert Beharie, Sgt. Maj. Dewey Blake and Command Sgt. Maj. Darrin Bohn how researchers modified a weapon to use cameras to view how it operates. (U.S. Army photo by Todd Mozes)

with the scientists and the people who work for RDECOM to make things better and to be part of that process. I think the collaboration between the two commands would be very important and really provide some insight into the future."

RELATED LINKS

Watch on YouTube: <http://youtu.be/cPPa58UjuuE>



By Dan Lafontaine
RDECOM Public Affairs

ABERDEEN PROVING GROUND, Md. — U.S. Army officials announced the winners of its greatest inventions competition Sept. 19.

A team of combat veteran non-commissioned officers, as well as U.S. Army Training and Doctrine Command field-grade officers, reviewed and voted for the Army Greatest Inventions of 2011.

Dale Ormond, director of the U.S. Army Research, Development and Engineering Command, commended the scientists and engineers for their efforts to empower,

“The contributions made by these teams promise to improve the well-being of Soldiers and the Army’s capability to contribute to quality of life and our national security.”

— Dale A. Ormond

unburden and protect Soldiers.

“The contributions made by these teams promise to improve the well-being of Soldiers and the Army’s capability to contribute to quality of life and our

national security,” Ormond said. “All of the nominated inventions demonstrate significant contributions to the warfighter.

“The 2011 award winners demonstrated significant impact to Army capabilities, potential benefits outside of the Army, and inventiveness. This program’s unique selection process reflects the voice of the Warfighter and insight into the future of Army equipment. The AGI awards are truly Soldiers’ Choice Awards.”

The awards will be presented during a ceremony in spring 2013.

The winners, in alphabetical order:

120MM ACCELERATED PRECISION MORTAR INITIATIVE CARTRIDGE

A 120mm Global Positioning System-guided mortar cartridge provides infantry commanders with new precision-strike capability. It replaces the current fuse in the standard M934 HE round with modifications to the fuse well and fin configuration to provide low-cost guidance capability that significantly improves the mortar round accuracy. The GPS coordinates are input from the current mortar lightweight or standard mortar ballistic computers with the addition of a Precision Lightweight Universal Mortar Setter System. The key to its enhanced performance is the GPS acquisition time and ability to maintain tracking throughout

the cartridge’s high angle of fire. (Source: U.S. Army Armament Research, Development and Engineering Center)

CAIMAN EXPLOSIVELY FORMED PENETRATOR ADD-ON-ARMOR KITS

An armor package is integrated into a Mine Resistant Ambush Protected vehicle with little modification to an existing armor package, protecting the driver and commander sides and mitigating the exposed area from explosively formed penetrators. The team used current panels, allowing for cost savings and quick replacement of damaged armor. The standard welded bosses were replaced with bolted bosses that reduced production time and eliminated warping of the aluminum plate without reducing performance. One hundred kits were requested for shipment to Iraq after successful installation in theater. The kit has had significant impact on survivability against targeted EFP attacks. (Source: U.S. Army Tank Automotive Research, Development and Engineering Center)

HELMET SENSORS

A helmet sensor and data retrieval system measures impact and pressure events continuously. This device is placed into the helmet, weighing only 2 ounces, to analyze the correlation between experienced head forces and

Mild Traumatic Brain Injury. This will aid in determining whether a Soldier should seek immediate medical attention and aid in the long-term care of the Soldier. Using low power, the battery can last up to 12 months. The National Football League is interested in an exchange of information that could aid in development of future systems capable of targeting and measuring affects to specific parts of the human body. (Source: U.S. Army Natick Soldier Research, Development and Engineering Center)

LEVEL 2 MANNED-UNMANNED TEAMING FOR THE OH-58D KIOWA WARRIOR HELICOPTER

The L2MUM is a real-time system that can receive video and metadata in the common bands, within a long range, and is used by fielded unmanned aerial systems first fielded on the Kiowa Warrior aircraft. The video and metadata can be unencrypted and encrypted. The software provides the user with UAS location on a standard Falcon view moving map display along with the metadata, which provides the user better and quicker situational awareness further from the target and engagement. The L2MUM aircraft allows specific aviation attack assets to see and understand strategic objectives, receives and provides intelligence to and from varied ground elements and tactically brings destruction to specific targets. (Source: U.S. Army Aviation and Missile Research, Development and Engineering Center)

M2A1 CAL .50 MACHINE GUN

The M2A1 is an enhancement to the .50-caliber M2, including a modified barrel, barrel extension, barrel support, barrel handle, flash suppressor and a fixed headspace and timing configuration. The M2A1 is an automatic, recoil-operated, link-belt-fed, air-cooled, crew-served weapon; capable of firing single-shot and automatic; and capable of right- and left-hand feed. The enhancements increase durability and Soldier safety moving the headspace and timing adjustment task above the operator level, thereby minimizing malfunctions and injuries in the field. (Source: ARDEC)

M982 EXCALIBUR INCREMENT 1A-2, 155MM EXTENDED RANGE PRECISION GUIDED PROJECTILE

A GPS-guided, inertial measurement unit-aided, fin-stabilized, 155mm projectile flies a ballistic trajectory during

its ascending branch, then a guided trajectory during its descending branch to preprogrammed target coordinates. It provides precision guidance and dramatically improves accuracy to less than 10 meters compared with hundreds of meters for conventional artillery ammunition. This increased reliability increases the probability of destroying the target and decreases the number of rounds needed to fire. The range capability increases from 25.3 kilometers to 37.5 kilometers. (Source: ARDEC)

OH-58D COMMON MISSILE WARNING SYSTEM

The OH-58D Common Missile Warning System provides missile warning and countermeasures for infrared guided missiles. This increases aircraft and Soldier survivability against guided-missile attacks. The technology detects a fired missile and then dispenses flares as a means to detour the missile away from the aircraft. (Source: AMRDEC)

PELVIC PROTECTION SYSTEM

The Pelvic Protection System is in response to an increased threat of buried improvised explosive devices, providing protection from serious injuries to the pelvis, femoral arteries and lower abdominal organs in a blast or small fragmentation threat. It aids in protection against sand and debris injected into the wounds sustained from IEDs, which may result in complications and significant chance of infection. The Navy and Air Force have inquired about procuring on future contracts. (Source: NSRDEC)

PRECISION LIGHTWEIGHT UNIVERSAL MORTAR SETTER SYSTEM

PLUMSS is a highly transportable, all-weather, rapid response, indirect fire control system that is capable of programming the world's first precision guided 120mm mortar cartridge. It uses GPS for precision that can provide indirect fire support that decreases the ammunition expenditure rate, limits collateral damage and provides accurate first round effects on target. Commonality and interoperability among already fielded platforms eliminates the need for additional resources for training and sustainment while providing valuable lessons learned during development. (Source: ARDEC)

SOLDIER PLATE CARRIER SYSTEM

The Soldier Plate Carrier System is a lightweight hard armor plate carrier system

with a modular lightweight load carrying equipment attachment that has a quick release capability, which aids in reducing load, increases mobility and provides direct fire protection. The SPCS consists of an outer carrier with soft armor ballistic inserts and a cummerbund for better system stabilization and increased ballistic area of coverage around the torso. (Source: NSRDEC)

2011 Soldier Greatest Inventions Award Winner

SMALL UNIT TACTICAL LIGHT

SUTL lights up target areas when motion is detected by using a 12-volt DC motion sensor to operate an infrared light. The motion sensor has a day/night sensor and switch to conserve battery life. A thermal imaging sensor is also encased with the motion sensor (motion must be made by something with substantial heat such as a person, large animal or vehicle). An infrared light allows the target or enemy to be known to friendly forces with night vision goggles while not alerting the target. (Source: 10th Mountain Division [Light Infantry])

RELATED LINKS

Army.mil: <http://go.usa.gov/rtaV>

Top 10 Military Inventions of All Time

While many may disagree with the particulars on this list, most will agree that all the weapon systems noted have played a significant part in revolutionizing warfare.

10. *The chariot*
9. *The sarissa*
8. *Sailing ships*
7. *The canon*
6. *The machine gun*
5. *The submarine*
4. *Paratroopers*
3. *The airplane*
2. *The aircraft carrier*
1. *The atomic bomb*

Read more: <http://bit.ly/NENq5c>

Source: David Hurlbert, Ph.D



Jill Smith makes a point during a discussion at the RDECOM Board of Directors meeting at West Point, N.Y., Sept. 12. Smith leads the U.S. Army Communications-Electronics Research, Development and Engineering Center. (U.S. Army photo by David McNally)

Spotlight: Jill Smith leads communications, electronics research

RDECOM Public Affairs

ABERDEEN PROVING GROUND, Md. — Jill Smith has been the technical director for the U.S. Army Communications-Electronics Research, Development and Engineering Center since October 2010.

Before that, Smith was director of the U.S. Army Research Laboratory's Weapons and Materials Research Directorate. She earned a bachelor of science in mathematics in 1974 and a master of arts in mathematics in 1975, both from Shippensburg State College, Pa. She also completed additional graduate work in statistics and electrical engineering at the University of Delaware.

What is the role of communications and electronics research and development?

CERDEC does command, control, communications, computers, intelligence, sensors and reconnaissance, known as C4ISR, for the Army. We are the network and knowledge fabric that integrates across platforms and to our joint and coalition partners.

We tie everything together and let the Army communicate — from the Soldier to the ground systems, to the air systems and across capabilities. We enable network-centric warfare.

Sensors provide information across the spectrum and provide situational awareness for all echelons. The network is really the integrating function for the Army and critical to executing our assigned missions by Department of Defense. If we are going to out maneuver our enemies on the land and in cyber space, we need to move information and knowledge faster than our enemies. We want to have a decisive advantage by having more situational awareness of them than they do of our forces.

How do you encourage collaboration and sharing across RDECOM?

Our mission and how we work together is through systems engineering, the "E" in RDECOM. Most of the requirements from the U.S. Army Training and Doctrine Command involve two or more research, development and engineering centers to

deliver the capability. About 90 percent of the requirements include the network to get information moved around the battlefield. Hence, we have to work together to fulfill the soldier's needs. The Army has not always done systems engineering early enough in the process. Many times we've built systems through the acquisition process and then integrated them later into legacy platforms. It is then we find that we are challenged for SWAP — size, weight and power. In RDECOM, we can systems engineer capabilities earlier, which means we have to work to understand the implications on our platforms as we build C4ISR systems. We also have to look at our legacy fleet to see what improvements need to be made to be able to incorporate the network, sensors, and battle command systems. Two of our RDECs have systems engineering responsibilities for subsystem lethality capabilities — missiles and armaments/ammunition. These get integrated into platforms — ground vehicles, air vehicles or Soldiers and the network integrates these into a system-of-systems and to our joint and coalition partners. So we all have to work together on the systems integration

delivering Warfighter capabilities.

What are the biggest challenges facing your workforce and RDECOM as a whole?

CERDEC has been through major changes in the past couple of years with the move from New Jersey to Maryland as part of the Base Realignment and Closure process, known as BRAC.

I want to give our workforce a big pat on the back. They made this move while delivering capabilities to our Soldiers – never dropping the ball. Many of them are carrying more than their weight right now as we still have some hiring to do. Even in this shrinking environment due to budget cuts, such as sequestration, we have some critical skill sets that need filled. Many of the Office of the Secretary of Defense priorities such as, Cyber, Electronic Warfare, Data-to-Decisions and Resilient systems fall directly in our mission area or we have significant contributions from electronics and communications. The Army Challenges that were just published by Assistant Secretary of the Army for Acquisition, Logistics and Technology cross all of RDECOM. Timely mission command and tactical intelligence to provide situational awareness and communications in all environments aligns directly with the CERDEC mission. We contribute to a number of other challenges, such as greater force protection to ensure survivability across all operations and easing overburdened Soldiers in small units where we are developing batteries and power sources that reduce the Soldier's load. We play a role in reducing target location error in enhancing lethality and accuracy for operational overmatch. And again the network links all the capabilities together with ever increasing demands for bandwidth and the extension of the tactical network to the "last tactical mile" – the extension of the network to the company and individual squad levels.

What are the things that excite you about the future?

Some of the things that excite me are defining and executing the vision for the Army Common Operating Environment, known as COE, and the Network Integration Rehearsal/ Network Integration Evaluation process for Agile Acquisition. I have been excited to be asked by senior Army leadership to help define what COE looks like for our tactical systems and the value it brings to Soldiers. Currently, we have a "boxology" acquisition process. We have a requirement – we build a box. Another requirement – another box. This gets capability to the Soldier, but is

not efficient nor easily upgraded. COE I liken to being able to build Army systems, e.g. vehicles, like the iPhone. You systems engineer capabilities (for example, GPS, camera, G4 comms) into your architecture and define the developer kit so others can write apps. We would like to system engineer similar capabilities into our vehicles or onto Soldiers (for example, position navigation and timing, sensors, communications, etc.) and define our developer kit so that we can integrate new capabilities for Soldiers faster.

Having a standard architecture allows industry to understand how they can "plug-in" new capabilities more rapidly and significantly reduce the cost of sustainment by decreasing duplicative components.

We can actually move technology into the hands of soldiers faster, in this future "plug and play" architecture. Everyone from the Soldier to government researcher to industry can develop applications faster if the interfaces

"We can actually move technology into the hands of soldiers faster, in this future "plug and play" architecture."

— Jill Smith

and developer kit is defined. We are currently a part of the team developing the standards and architecture to have our upgrades to systems to be at the board and chip level rather than the box level plugging into a bus architecture so that we will be able to keep pace with the speed of change of technology. It is more capability on chips and more chips on boards that allow increased capability over time in the same space, weight and cost. We want to be able to take advantage of the speed of commercial development.

We really have an opportunity now. I've been through three of these eras of declining budget and while others may not see the opportunity, it exists for our S&T to build our next-generation systems. While we are at war, is not the time to be switching architectures. It is when we are acquiring fewer systems or minimally upgrading systems that we can focus S&T on future leap-ahead technologies for the next generation of system. Given the pace of technology growth in the areas of electronics, sustaining current capabilities will not keep us at the leading edge for the future. Hence, it is evident that we have a need to move to an architecture that can keep pace with technology development. When the Army is again ready to increase buying of capability we must provide state-of-the-art systems that are more advanced

than our adversaries. Our electronic warfare, intelligence and communications systems of today will not be leading-edge capabilities in five years or even less.

While developing next-generation capabilities, we are also paying attention to the DoD guidance in the areas of the globe and missions the Army has to execute. We do not want to invest S&T to fight the last war, but look forward to be able to go anywhere we are called upon to do the variety of mission that is the Army's.

What advice do you have for the next generation of researchers, engineers and developers? How about long-time employees wondering about the future?

It is a bright future for our next generation of researchers, engineers and developers. The Army does not lack for hard problems and challenging missions in the future. Electronics and software-base capabilities are the fastest moving technologies and hence an opportunity for us to have an advantage over our would-be enemies. Given that we have hired many people representing our next generation – they are outstanding technically, energetic and driven to contribute to our Soldier. We have a very bright future.

Our long-time employees see the future of COE and are excited to lead the change. Our technical leadership has been recognized by the Army System-of-Systems Integration Office of ASA (ALT) funding a full battalion slice of NIR/NIE in our laboratory for the integration risk reduction to support the NIE/ NIR. This is a one-of-a-kind capability at APG that we jointly support with Program Executive Office Command, Control, Communications – Tactical, known as PEO C3T, and Program Executive Office Intelligence, Electronic Warfare, and Sensors, known as PEO IEWS. It is being used by industry and government to reduce the risk of development and integration enabling much earlier resolution of integration or other problems. It has also allowed industry to understand the capabilities that already exist and how to interface with them or to fit into the Army network architecture. Although there is still some learning to make this an efficient Agile Acquisition process, clearly the Army and DoD need a different process for buying electronic systems than the DoD 5000 series for acquisition.

My advice for the next generation – if you focus on the Soldier and providing them the best capabilities to accomplish their mission in support of our country for the future, you will have a rewarding career and the satisfaction of ensuring our freedom every day. It is great to support Soldiers!

Army exchange program enhances engineer's career

By Roger Teel
RDECOM Public Affairs

ABERDEEN PROVING GROUND, Md. — The decision to apply to the Army's Engineer and Scientist Exchange Program seemed like an easy one for an engineer assigned to the Edgewood Chemical Biological Center.

"The [Engineer and Scientist Exchange Program] came as a right-time, right-place moment for me," explained Steve Carrig. "I'd been in my job with the Joint Project Manager for Nuclear, Biological and Chemical Contamination Avoidance for roughly five years, and was feeling the itch for something different."

Carrig now serves as an engineer at Australia's Defense Science and Technology Office in Melbourne. His tour runs through 2013.

The Deputy Assistant Secretary of the Army, Defense Exports and Cooperation manages the Engineer and Scientist Exchange Program, or ESEP, and selects top-performing, mid-career level engineers and scientists from across the Army every year for assignment to an allied military establishment. Assignments complement a participant's background and offer tangible benefits to both the Army and the overseas host.

Jason Craley is a member of the U.S. Army Research, Development and Engineering Command's International Technology Integration team that coordinates the ESEP and prioritizes command applicants before submitting packages to Army Materiel Command and DASA DE&C.

"A call for applications, called the ESEP Group Announcement, is issued by DASA DE&C by the end of June each year," Craley said. "We are currently accepting applicants for Group 9, which will deploy overseas in August 2013. Applications are due to our team by October 12th."

"When the call came out for ESEP applications in 2010, I was almost too late," Carrig recalled. "Thinking my wife wouldn't want to move, I didn't bring it up until nearly the last minute. I was on leave the week applications were due, and I ended up submitting mine really late in the evening on a Sunday night to meet the Monday morning deadline."

"During the application process, the International Point of Contact will assist you with putting the paperwork together," Carrig said. "You can also rely on ITI for help as well."

Craley stressed the application requires four elements: a resume, a list of career-broadening objectives, a position description outlining your intended overseas assignment, and a technical director endorsement signed at the senior executive service or general officer level.



Engineer and Scientist Exchange Program participant Steve Carrig and co-worker Julia Freeman operate Chemical Articulated Test Manikin in Australia's Defense Science and Technology Office's new Environmental Test Facility in Melbourne, Australia. (Courtesy photo by Brian Crowley)

Staffing the endorsement memo may take time, so applicants should plan accordingly.

The most challenging part of the application process, however, is making contact with a potential host overseas and identifying an assignment that's the right fit. That was especially challenging for Carrig as his contacts were limited.

"Perhaps slightly atypical for the way ESEP applications were previously done, I had no established foreign contact," he said. "Instead, I

interpreted the application package in such a way that I requested to be placed in several different countries. When the memo was released with selections and their corresponding countries, I was awaiting a response on my application to Japan, not Australia, the country for which I was chosen."

Craley said RDECOM offers assistance in this area.

"For the last two years our office has provided a list of open ESEP positions pre-

coordinated between RDECOM Forward Elements, International Technology Centers and their respective countries," Craley said. "This provides some options to people who are interested in the program, like Steve was, but who may not have foreign contacts to assist with coordinating an assignment.

"Applicants are always encouraged to build upon their current work experience if they do have contacts through multinational programs and exchange agreements," Craley added. "However, since Steve applied, a better defined position description has become more important to have up front as opposed to after selection. The reason is that DASA DE&C wants as much information as possible before selecting applicants. And it cuts down a lot of last-minute coordination before going overseas."

Applicants are encouraged to apply for up to three countries, one primary and two alternates, in case their first assignment is not available. Applicants can choose from 17 countries that have an active ESEP memorandum of understanding with the United States. Popular countries include: the United Kingdom, France, Germany, Japan, South Korea, and, of course, Australia. ITI can provide a full list on request.

Carrig said the key to the application process was finding the right people.

"Not having completed a master's degree or thesis of my own, I can only speculate, but from the conversations I had with my colleagues in the time between receiving the selection memo and when my wife and I got on the plane made me think the ESEP process is very much like post-graduate work. It's all about knowing the right person or people to ask for help when you get stuck in filling out the paperwork," Carrig said.

Once application packages are received at RDECOM they are thoroughly reviewed and scored according to several criteria, including the applicant's educational and career background. A bachelor's degree in science or engineering is required to apply, and individuals with advanced degrees score higher, according to Craley.

"Language capability for the intended assignment must also be in place," he continued. "In the past, DASA DE&C has funded language training for selected applicants, but that has been cut. An applicant's organization can fund this if needed, but expect to go into an application with a working knowledge of the language for the country you are applying.

"Thorough position descriptions and demonstrating an alignment to Army S&T objectives is important," Craley added. "We also look at how long an individual has been with the government since this program is geared toward mid-career level engineers and scientists in the GS 12-to-14 range. The intent is to have someone come back from an assignment and

be of benefit to the Army for many years to come with experience and insight gained abroad."

Once Carrig learned he had been selected to go to Australia, he began the process of transporting his entire life to the other side of the world.

"There were times when I didn't think we'd actually make it out of the country," he said. "In fact, I had to request a two-week delay due to some missed milestones. But the movers came and packed up our stuff. We lived with my parents for a week, and then got on the plane with our nine bags of luggage. Yes, nine! Four suitcases and five boxes. We were definitely a sight to see moving through airports!"

"Once an applicant has been informed of their selection, the real work begins," Craley explained. "You'll need to complete draft Temporary Change of Station or TCS orders. For all RDECOM selectees, a designated point of contact -- Terry McGahan -- at the Armament Research, Development and Engineering Center International Office, assists with order preparation and answers all questions regarding financial allowances.

"Finally you need to set your departure date and ensure all passport and visa requirements are met, as well as any medical requirements," Craley added.

For participants traveling with young family members there are schooling considerations to take into account. Housing must be found and may take some time. For this reason a temporary housing allowance is provided.

"Though daunting, participants aren't alone during this process," Craley stressed. "Their IPOCs, ITI, Forward Element and ITC personnel will support them and offer advice when needed.

Once Carrig arrived and settled into his assignment in Australia, he found he wanted to stay even longer.

"We made it to Australia, and 88 days later so did the rest of our stuff," he said. "Now it's just barely a year since we landed, and with an extension applied for and granted, we've started our second of two years living in Melbourne through ESEP."

Assignments are initially for one year, and an extension request for an additional year can be submitted to DASA DE&C after getting a feel for the assignment, but no more than six months after you start, according to Craley.

"Once on the ground in your assignment, reporting requests vary depending on your home organization. And once you return home, you will submit an end of assignment report along with an evaluation from your host rating your performance and the benefit of the overall experience."

For Carrig, the assignment has been professionally, and personally, rewarding.

"My work here with DSTO has been both

intimidating and challenging," he said. "My team consists of brilliant scientists, and my engineering background sticks out like a sore thumb. However, despite my rusty college-level laboratory skills, the folks down here have been patient in their approach of letting me tinker around in the lab again. Additionally, I arrived at DSTO with a level-three certification in test and evaluation, and so it's that experience I've relied on for my greatest contribution."

"I came here at a very opportune time in that DSTO was in the process of standing up a walk-in-sized chamber to do full individual protective ensemble testing via articulated manikin," said Carrig. "It's been my challenge to verify the operation of the chamber as well as provide test results on the vapor-generation system that's been developed for the chamber."

"Right now, my daily responsibilities involve supporting a cold-weather test that's using the chamber's environmental controls," he continued. "In addition to providing support to another DSTO team, I'm using the past seven week's worth of sub-freezing temperature data as a means to verify the chamber's operational conditions."

"I'm not entirely sure where my career will go after ESEP," Carrig continued. "I hope to use some of the things I've learned in the realm of individual protection to my advantage when I return to ECBC. I also like to think that by keeping up with some of my test and evaluation experience I'll be able to continue my work in that field.

"Most importantly, though, I've made a set of great contacts in Australia's chemical-biological knowledge base," he said. "While I may be a fairly low man on the totem pole, I feel confident that the bridge building done via my time here with DSTO can only help big-picture workings like The Technical Cooperation Program."

"If I'm honest, my wife, Erin, and I have had our moments of being homesick," Carrig said. "But we made the choice to stay in Melbourne another year, and so far it's been the right one. I'm definitely grateful for the opportunity that ESEP has provided. I would do it all again if I had the chance."

"But next time I would pack for two years (even if we only stayed one) and have the movers ship more than just a few sparse things. My wife misses her copper pots, and I miss my couch."

(NOTE: For more information on the ESEP program or for application assistance contact Jason Craley, (410) 278-8591, email: jason.c.craley.civ@mail.mil)

RELATED LINKS

Guidance: <http://go.usa.gov/rJFA>

Scientist protects nation against chemical agents

By Dan Lafontaine
RDECOM Public Affairs

ABERDEEN PROVING GROUND, Md. — A recent college graduate moved from Texas to Maryland so he could work with the best scientists in the field of chemical defense.

Brandon Bruey, a chemist with the U.S. Army Research, Development and Engineering Command, said his position allows him the best opportunity to use classroom principles for real-world applications.

TRANSITION FROM THEORY TO HANDS-ON WORK

“What prompted me to move away from Texas was the opportunity to come to the pinnacle research center for chem-bio defense,” Bruey said. “I had been looking for an opportunity to work with the world’s top scientists in this field. I figured the only way to become the best was to work with the best.”

After graduating from the University of Texas in 2008 with a bachelor of science in chemistry, Bruey worked primarily on explosives for a defense contractor for three years. He then accepted a job at RDECOM’s Edgewood Chemical Biological Center in 2011.

“For me, the chemistry associated with chemical warfare was always on a whiteboard or chalkboard. I made the choice that if I wanted to truly understand this, I needed to come to one of the few places in the country where I could get hands-on and do it for real,” he said. “That’s where my interest stems from -- [moving] from theoretical work to hands-on work.”

Although he has worked at ECBC for only a year, Bruey said his research on chemical agents has been valuable and meaningful.

“I’m able to work on extremely important and difficult work,” he said. “I can go home at the end of the day and feel like the work I did was important and made a difference in the world.”

FIRST STEP IN CHEMICAL DEFENSE COMMUNITY

Bruey handles, synthesizes, purifies and destroys chemical agents in ECBC’s Chemical Transfer Facility as part of the Chemical Biological Applications and Risk Reduction Unit. He develops and carries out experiments related to chemical agent detection or destruction. He also processes evidence and unknown samples received from other government organizations.

As a synthetic chemist, Bruey is often tasked with providing new chemicals to research laboratories in the chemical defense community.

If the chemical cannot be pulled from existing stocks, he examines a chemical’s molecular structure and then conducts journal research



Brandon Bruey, a chemist with the U.S. Army Research, Development and Engineering Command, handles, synthesizes, purifies and destroys chemical agents. (U.S. Army photo by Tom Faulkner)

to determine whether an existing synthetic pathway exists or if a new procedure needs to be developed. He then develops a synthetic procedure, performs the chemical reactions, and decides which purification steps are required before the compound is characterized using a suite of analytical instrumentation.

ECBC is able to provide all chemical agents needed by government or contractor laboratories for use in defensive research, Bruey said.

“If a laboratory needs agent for use as an analytical reference standard or to develop medical countermeasures, detection technologies, or personal protective equipment, we’re one of the first steps,” he said. “We can make the agent and provide it for them. It’s the first step in a large chain of what makes up this part of the chemical defense community.”

Despite the danger associated with working with chemical warfare agents, Bruey said he trusts his education and training, as well as the Army’s built-in protective measures, to remain safe. ECBC researchers use gloves, suits and protective masks, including air-purifying or supplied-air respirators, to guard against the chemical hazards.

“You may learn the fundamentals in school using more innocuous chemicals. But many of the same procedures actually apply when you’re working with chemical agent,” he said. “You have to fall back on the basics you learn in school, along with your job-specific training, to be successful working with these chemicals. You

must understand the strengths and limitations of the equipment that you’re using. You can’t be scared of it; you just have to respect it.”

‘DON’T SHUT OFF ANY OPPORTUNITIES’

Aspiring scientists should keep asking questions so they can understand how to apply classroom material in the real world, Bruey said.

“I remember sixth-grade science class and finding that I was probably annoyingly inquisitive with all my teachers,” he said. “I found that science typically was able to answer a lot of the questions that I kept asking my parents, friends and teachers.

“You can go through high school and college, learning information, but never really understand how you can apply it. You must always make sure you know why you are learning something and how you can use that information in the real world.”

Bruey also encourages students to keep an open mind during their academic pursuits.

“I initially went to the University of Texas as a music major. I started studying music, and I took a few chemistry classes, which sparked an interest. I went to college thinking I would be a band director or classical performer. I’m now here at Edgewood as a chemist. Make sure you don’t shut off any opportunities for yourself,” he said.

RELATED LINKS

Photos: <http://bit.ly/PB6rE3>

APG leaders discuss vision for STEM education outreach

By Dan Lafontaine
RDECOM Public Affairs

ABERDEEN PROVING GROUND, Md. — Because of Aberdeen Proving Ground's new role as the Army's hub for science and technology, officials say the installation has the opportunity to become a national leader in science, technology, engineering and math education outreach.

The thousands of scientists and engineers at Aberdeen Proving Ground, or APG, should spur innovation as the Army promotes interest in science, technology, engineering and mathematics, said Patrick Baker, who recently assumed the newly created position of APG STEM Champion.

STEM stands for science, technology, engineering and math.

"If we come together as a unified force of Team APG in STEM, we will be national leaders in the STEM community," Baker said. "As Team APG, we will be innovators in STEM the way we are innovators with technology."

Baker serves as director of the Army Research Laboratory's Weapons and Materials Research Directorate at APG. He was inducted into Senior Executive Service May 20.

Suzanne Milchling, director of program integration at the U.S. Army Edgewood Chemical Biological Center, has joined Baker as APG STEM Champion, focusing on the installation's Edgewood area.

"One of our collective goals as Team APG is to be ahead of the curve when it comes to the development of a highly skilled, future STEM workforce," she said. "To move our installation and the nation in this direction, it is critical that senior leaders like Doctor Baker and I help achieve APG's STEM goals.

"I would like to challenge everyone with a background in science and engineering to identify ways to get involved in STEM educational outreach initiatives," Milchling said. "From personal experiences, I can attest to the rewarding nature of sharing your passion for STEM professions with students and their educators."

Louie Lopez, STEM outreach program manager for the U.S. Army Research, Development and Engineering Command, said five major installation tenant organizations are finalizing an education partnership agreement with Harford County Public Schools.

Participating APG organizations are RDECOM; U.S. Army Communications-Electronics Command; U.S. Army Test and Evaluation Command; U.S. Army Public Health Command; and U.S. Army Program Executive



Edgewood Middle School students participate in a science, technology, engineering and mathematics, or STEM, outreach activity led by the U.S. Army Edgewood Chemical Biological Center during the Technology Needs Teens program at Harford Community College in Bel Air, Md., May 24. (U.S. Army photo by Conrad Johnson)

Office Command, Control, Communications-Tactical.

The agreement's goals are to encourage and enhance study in the STEM disciplines; link students and teachers to APG scientists and engineers to better understand the relevance of STEM subjects; and leverage regional STEM efforts in support of educational goals, according to Lopez.

Baker and Lopez said the partnership will allow APG's STEM coordinators to present a clear and unified message when interacting with students, teachers and parents.

Another initiative is to create a STEM facility on the installation, Baker said. This would allow APG to expand its activities with the students and teachers by having laboratories dedicated to STEM outreach instead of relying on facilities used for active Army research and development.

The Army should also leverage STEM as an ambassador to the local community, Baker said. These efforts will help attract high-tech workers to the Army and allow the public to understand the important work being done at APG.

"During the Cold War, APG was a mystery to the community. That has changed over the years," Baker said. "I believe APG is much more engaged with the community today, and Team APG STEM can build on

that momentum. Personnel involved in STEM outreach are ambassadors for the Army. They help maintain excellent relationships with our local community."

The APG STEM community must also look beyond northeast Maryland in order to become national leaders, Baker said. APG should seek partnerships with other federal organizations.

"Outreach ultimately goes well beyond our local area," Baker said. "We'll have a center of mass here, but we want to be looking all over the country. We want people to seek us out. We're a small fish in a big pond when it comes to STEM. We need to look beyond and understand what's going on in the rest of the country."

Baker said the ultimate goal of outreach efforts should be to improve academic performance in science and math subjects, which would lead to more students who pursue a STEM career path for our country.

"I'm hopeful that if we look back 10, 15, 20 years from now, the STEM activities that we're pushing today are going to allow us to say, 'Look where we are now because of what we did 15 to 20 years ago.' That's what it's all about," Baker said.

RELATED LINKS

Army.mil: <http://go.usa.gov/r6pB>

Army scientist recalls six decades of inquiry, breakthroughs

By Dan Lafontaine
RDECOM Public Affairs

ABERDEEN PROVING GROUND, Md. — After more than 60 years as a researcher, educator and mentor, Dr. Harry Salem remains committed to advancing the field of science in the U.S. Army.

Salem's talents and expertise led to an already distinguished career spanning three decades in pharmacology and toxicology -- including the development of the cold and cough remedies NyQuil and Contac as well as the extended-wear soft contact lens Permalens -- all before joining the Army as a civilian scientist in 1984.

In his current role as the chief scientist of life sciences, Salem oversees and guides research efforts at the U.S. Army Research, Development and Engineering Command's Edgewood Chemical Biological Center. He has recently created a Center of Excellence for Stem Cell Research, recruiting 12 post-doctoral students to help embark on his vision.

PROMISING RESEARCH IN STEM CELLS

Stem-cell research holds the greatest opportunity for advancements in medicine, according to Salem.

"Stem cells are the future of medicine," he said. "I can see the potential of this, not only in regenerative medicine, but also in testing for safety and efficacy and medical mitigation, including all aspects of pharmacology, toxicology and medicine."

Historically, cellular-based testing has been conducted on immortalized tumor cell lines, Salem said. These are cells that have had tumor genes introduced into them to make them immortal and able to survive in cell culture outside the body.

Salem's researchers have recently acquired a novel in vitro technology in which they are able to convert samples of human skin and blood cells into new kinds of stem cells known as induced pluripotent stem cells. IPS cells are artificially derived, typically from an adult somatic cell, by forcing the expression of specific genes that cause them to differentiate into a particular cell type, Salem said.

Salem emphasizes that his group does not use human embryonic stem cells, which are isolated from embryos and embroiled in ethical controversy.

One of Salem's scientists spent a year at Johns Hopkins University learning the latest techniques in IPS cell technology in order to initiate the stem cell work at ECBC laboratories.

"In the last year we have transitioned the



Microbiologist Dr. Bob Moyer (left) speaks with Dr. Harry Salem, chief scientist of life sciences for the U.S. Army Research, Development and Engineering Command's Edgewood Chemical Biological Center. (U.S. Army photos by Tom Faulkner)

technique to our laboratories so we're actually doing it here at ECBC. We're making the cells here and getting ready to use them for testing," Salem said. "We can now make tissues of different organs from stem cells."

The National Research Council Post-Doctoral Program, the Defense Threat Reduction Agency and ECBC are sponsoring Salem's work on the lungs, liver and heart. He is looking to expand the laboratory's research with additional organs and to involve more scientists so the team has an expert on each organ of interest.

According to Salem, the Army is partnering in this field with Johns Hopkins University, Harvard University, University of Michigan, Wake Forest University, and Massachusetts Institute of Technology.

Regenerative medicine is one of the promising areas the Army and its partners are pursuing. Salem believes the research could benefit the military as well as civilians.

"Soldiers who come back with a lost limb may be able to have them re-grown. That's the ultimate advance that we're looking for," he said. "That's one of the hopes we have."

"Wake Forest has made stem cell bladders and implanted them in children. They have been functioning for several years. Perhaps a lot of diseased organs can be replaced. Most of the things we do now will not only help the military, but it will serve a dual purpose -- it will help civilians as well."

FAMILY ILLNESS PROMPTS INTEREST IN

SCIENCE

At the age of 8, Salem was confronted with his maternal grandmother's unexpected illness. He described the profound impact her diagnosis would have on his academic endeavors and professional career.

"My maternal grandmother lived with us. All of a sudden, she was diagnosed with tuberculosis without any visible signs or symptoms. She was abruptly taken from our house, and that was it," he recalls. "She was put in a sanatorium, which was quite a distance from where we lived."

"At my age, I was not allowed in the sanitarium. I could only look through the window, and somebody had to lift me up so I could see my grandmother. One day as I was looking through that window, I vowed that someday I would do scientific research, not knowing what it really was, to prevent or cure lung diseases. That's when I decided I would like to do it. It seems like my life was steered in that direction."

A native of Windsor, Ontario, Canada, Salem earned a bachelor of arts in general sciences at the University of Western Ontario in 1950. After visiting his older brother during a football weekend at the University of Michigan, Salem enrolled there, where he earned a bachelor of science in pharmacy in 1953.

Salem recalled an experiment during his third year at Michigan that spurred his passion for pharmacology.

"I still remember the experiment that made me fall in love with pharmacology. They put

a cat in a bell jar, and then put a mouse into its space. The cat immediately attacked the mouse. At the time they were working on mind-boggling drugs, and they injected the cat [with a drug]. Then they put a mouse in its space, and the cat ignored it completely. That's what hooked me," Salem said.

Salem then returned to Canada for his graduate studies in pharmacology at the University of Toronto, where he earned a master's degree in 1955 and a doctorate in 1958.

Salem's master's degree thesis work included the initial evaluation of the breathalyzer blood-alcohol level test. The equipment used by police to check drivers' sobriety was quite advanced, although their method for capturing exhaled breath was rather rudimentary, he said.

At that time, when the police investigated an accident or caught someone suspected of driving under the influence, the driver or suspect would blow into a rubber balloon.

"They took these latex balloons to the police station, and when tested, there was no alcohol there. The policeman would swear, 'I could smell the alcohol. The guy was drunk. I know it.' But there was no alcohol, so they couldn't do anything," Salem said. "We looked at other plastics, and what we found was the alcohol was passing through the rubber of the balloon and dissipating into the air. We developed a polyethylene plastic bag for them to blow into. The half life for alcohol was about five hours in the polyethylene plastic bags versus 15 minutes in the rubber balloons.

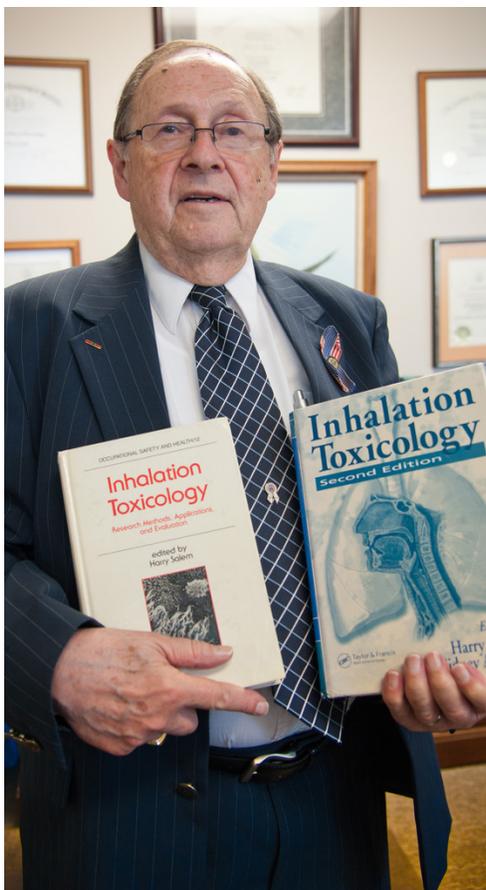
"Later on when Saran Wrap was developed, we fabricated a Saran plastic bag that you blew right through. It collected the alveolar air, the last portion of air exhaled, and that was correlated with the amount of alcohol in the blood. The half life for alcohol in the saran bag was about 24 hours."

A LIFETIME DEVOTED TO ADVANCING SCIENCE

After earning his doctorate in 1958, Salem held positions in industry and academia, where he developed a strong reputation as a researcher and educator. His successes include incubators for premature babies, a labor induction drug, drugs for the common cold and cough, and continuous wear soft contact lenses.

While working for Smith Kline and French, Salem directed the respiratory research laboratories for the Menley and James Division, where he participated on the team that developed Contac.

Later, he joined Richardson-Merrell National Drug Company in Philadelphia, where he led the respiratory research



Dr. Harry Salem serves as chief scientist of life sciences for the U.S. Army Research, Development and Engineering Command's Edgewood Chemical Biological Center.

laboratory for a subsidiary, Vicks. In this position, he was on the successful team that developed NyQuil.

"In those days we joked, 'We have a NyQuil. Why don't we have a DayQuil?' Thirty years later, there is a product called DayQuil," Salem said.

Salem also taught pharmacology and toxicology at the University of Toronto, University of Pennsylvania, Temple University, Drexel University, University of Maryland and Rutgers University, where he is still a visiting professor. He has published 13 books, including three volumes of the International Encyclopedia of Pharmacology and Therapeutics, as well as more than 100 papers in scientific journals.

In addition to his research for the Army over the past 28 years, Salem has served as a consultant for federal government organizations, including the U.S. attorney general, FBI, Environmental Protection Agency, Department of Homeland Security and Congress.

In 1993, he advised then-U.S. Attorney General Janet Reno as she considered

options to intervene at the Branch Davidian compound in Waco, Texas.

"The FBI took me down to visit with [Reno]. When she came into the room, I didn't know whether I was going to brief her or just answer questions," Salem said. "She came in and started firing questions, and I responded. She was direct. I was very impressed with her and the way she worked. I told her all about the riot-control agents that we had worked with.

"I gave her good, sound scientific advice. She asked me to appear with her on '60 Minutes,' but the Department of Defense thought better of that. I did not appear, although she said very nice things about me on television."

For the 1996 Summer Olympic Games in Atlanta, Salem served as the chairman of the pharmacy committee for the Office of Emergency Preparedness of the National Disaster Medical System.

In 2001, Salem was awarded the Society of Toxicology Congressional Science Fellowship and spent a year on Capitol Hill as a Congressional adviser. He worked in the office of U.S. Rep. Jim Greenwood, who was chairman of the House Energy and Commerce Committee and responsible for oversight and inspection of the National Institutes of Health and EPA.

Salem recalled the events of 9/11.

"On Sept. 11, 2001, Greenwood had called for a bioterrorism hearing. I was on the way to the hearing room when the first plane hit. I was sent back to my office, and I saw the second plane hit on television," he said.

Salem said he still wears the American flag pin, which was given to him by his Congressional colleagues shortly after 9/11, on his suit jacket.

LEADING FUTURE GENERATIONS OF SCIENTISTS

As Salem discussed his work over 60 years, he reflected on the legacy left for future generations. He spoke fondly of his post-doctoral scientists and colleagues.

"I hope I've inspired the young people to continue doing research. Don't be afraid of learning something new," he said. "When I went to school, nerve cells didn't regenerate. That's what I was taught. Now we're doing it in our labs right here. That's exciting.

"I want to leave a legacy. My boss once said to me, 'Everybody knows who I am. It's up to me to make sure they know who you are.' "

RELATED LINKS

Watch on YouTube: <http://youtu.be/grpfyTa2Qil>

For Soldiers of all sizes, engineer ensures the right mask

By Dan Lafontaine
RDECOM Public Affairs

ABERDEEN PROVING GROUND, Md. — An ill-fitting chemical-biological protective mask could expose Soldiers to potentially lethal hazards during combat.

For Soldiers who cannot find a proper fit with a standard-issue mask, Cindy Learn and her colleagues are working to avoid any gaps in protection. Learn, a system engineer with the U.S. Army Research, Development and Engineering Command, says her goal is to ensure users are safe from chemical, biological and radioactive particulate threats.

'NO WARFIGHTER LEFT BEHIND'

"I like to call it 'No Warfighter left behind.' We make sure every Warfighter has a mask to use when they go to theater," said Learn, who works on the mask program for RDECOM's Edgewood Chemical Biological Center, supporting the Joint Program Executive Office for Chemical and Biological Defense. "They are protected so they can protect us."

The Hard-to-Fit Program accommodates members of the Army, Navy and Marine Corps, as well as Department of Defense civilians who are required to wear masks for their jobs.

"A Warfighter cannot be deployed without a mask that fits properly and securely to the face," said Learn, who has been an Army civilian for six years. "There are infinite different shapes and sizes of faces, and having a protective mask that fits well is essential to any deployable mission.

"Not being able to get your hands on the right fitting mask could be a career ender for some."

FINDING A PROPER MASK FIT

Currently fielded mask styles, including the M40 series and M45, are designed to fit 95 percent of head sizes. Newer masks, including the Joint Service General Purpose Mask (M50) and M53 series, are designed to fit 98 percent.

The program, which is part of ECBC's Protection Engineering Division, fit 100 people in 2011 and has fit 38 in 2012 as of Aug. 23. Most requests come from the Army's chemical, biological, nuclear and radiological defense school at Fort Dix, N.J., and chemical school at Fort Leonard Wood, Mo.

The Army uses the M45 as the hard-to-fit mask solution, Learn said. It comes in four



Cindy Learn (left), a system engineer with the U.S. Army Research, Development and Engineering Command, adjusts the components of the M45 mask to ensure a proper fit. (U.S. Army photos by Tom Faulkner)

mask sizes and five nose-cup sizes, which are interchangeable. Most other standard-issue masks have only three sizes with a fixed nose-cup. Interchangeable nose-cups allow for a more custom fit.

The Hard-to-Fit Program does not redesign a new mask for those who do not fit in the standard version. The group alters a mask to fit a person's face by mixing and matching parts.

"If someone decides they need a hard-to-fit mask, they will contact us and tell us what mask they were best able to achieve a fit with, although they couldn't get a passing fit," Learn said. "That gives us a good idea about what size they would be in the M45. Sometimes they are extremely hard-to-fit, and they will travel to ECBC's mask issue, where I will meet them and work with the fitting facility to make sure they can achieve a proper fit."

The program began in the late 1970s, when engineers would make someone a custom mask, which had significantly higher costs as well as time.

SERVICE FOR SOLDIERS' EQUIPMENT NEEDS

Learn said an important part of her



Cindy Learn (left) and engineering technician Candy Johnson place the Joint Service General Purpose Mask on a mask leakage tester and add test adapters to evaluate the equipment serviceability.

work is to communicate with users and provide solutions to their issues and questions regarding chemical, biological, and radiological protective equipment. Her group works in the sustainment part of the equipment life cycle and is responsible for managing the items after they have been fielded.

Servicemembers can request parts information and make recommendations to the engineers for improving equipment. The Protection Engineering Division also performs extensive testing of parts to ensure products fulfill user needs and expectations, she said.

"Our masks are designed to protect

against all chemical and biological agents that are currently a threat. We do a lot of agent testing here at Edgewood with other branches,” Learn said. “We supply the canister, and we give them a test plan with what agents and challenges they need to test against to make sure our materials are up to par.”

PROTECTION FOR GROUND VEHICLES

In addition to her role with the Protection Engineering Division, Learn began working a few months ago with the Program Manager of Ground Mobile Platform CBRN Survivability. The organization provides CBRN survivability expertise for all major Army, Navy, Air Force and Marine Corps ground-vehicle programs to allow them to meet the CBRN survivability mission requirements.

For the service's ground vehicles, the incorporation of CBRN sensors, CBRN filtration systems, CBRN individual protection and decontamination systems need to be addressed.

“We make sure that if there's a CBRN need in the vehicle, they know what kind of equipment is available for them,” she said. “We give them lots of information -- the weight of products, the function of products, and where to order to them. We are the CBRN point of contact between the joint program managers within the JPEO-CBD for all ground mobile systems.

“We provide a set of tailored services to a major defense acquisition program at all stages of development.”

Learn said this new role will expand her focus and allow her to learn about all aspects of CBRN protection.

'I'VE BROUGHT IT TO THE FOREFRONT'

Learn, who earned a bachelor of science in chemical engineering from Virginia Tech in 2004, said her greatest success as an Army engineer is revitalizing the Hard-to-Fit Program. Her involvement in the process has brought greater organization, ease of use, and quicker service, said Jim Church, Learn's supervisor and branch chief of the Joint Service Physical Protection Engineering Branch.

“[The program] existed before I got here, but I feel like I've brought it to the forefront. I've produced articles on the program and tried to tighten the circles to make sure everybody understands what the program can do for them,” she said.

RELATED LINKS

YouTube: <http://youtu.be/AoPHqN3ZbHE>

Communications-electronics research leadership strengthens bonds with local industry, government

By Kristen Kushiyama
CERDEC Public Affairs

ABERDEEN PROVING GROUND, Md. — The associate director for the Research, Development and Engineering Command's communications-electronics center, or RDECOM CERDEC, spoke at a professional organization luncheon Sept. 12 at Top of the Bay here.

Robert Zanzalari, CERDEC associate director, talked to members of the Armed Forces Communications and Electronics Association, or AFCEA, Aberdeen Chapter about the broad mission areas of CERDEC, CERDEC goals for 2020 and beyond, and where people can find more information about contracting and partnering with CERDEC.

“There are a lot of new companies, a lot of new faces that may not know what CERDEC does,” Zanzalari said. “I thought it would be beneficial to give them a base line of who we are and our areas of interest from a technology perspective.”

The luncheon was an opportunity to inform industry members about national defense and budget strategies and to inform them how those issues affect CERDEC. This should help them plan support for jointly executed projects and programs, Zanzalari said.

Zanzalari described a future Army where technologies are self-sustaining in terms of alternative power and micro-grids, agile and intuitive rather than today's stovepipe capabilities, which are heavily dependent on a potentially vulnerable supply chain.

CERDEC's sees a paradigm shift for C4ISR systems moving from a “single box” for a “single capability” to where independent systems have their own controls and displays, to a concept of defining the long term integrated vision of system-of-systems, where there are standardized interfaces and common services, Zanzalari said.

Since CERDEC relocated to APG from Fort Monmouth, N.J., there have been new approaches to problem solving brought to the organization by companies that did not previously do work with CERDEC, he said.

“Being down here, being in a new environment has helped us think more broadly in totality across our mission areas,” Zanzalari said.

Zanzalari emphasized communications-electronics technologies on which CERDEC works are on every platform from the Soldier to aircraft. CERDEC's concentration in spectrum management and utilization; efficient mission command systems; cyber operations; maneuver support; force protection; and early detection and understanding of threats, can be used to maintain the Army's operational advantage and to combat adversaries who leverage commercial electronics.

“Partnership is important to us, and partnership doesn't necessarily always have to be [dependent] on having a contract to do work effort for us. There are many opportunities to work with us to get to the end state that we need to deliver products to the Warfighter,” Zanzalari said.

Most of CERDEC's contracting goes through broad area announcements, which can be found on the Federal Business Opportunities' website.

“In addition to broad area announcement, we continue to have open doors across the organization in terms of coming in and understanding what companies are working on and how they can help solve the problems we are trying to solve,” Zanzalari said.

“I think it is important for senior leaders in the community to engage with our industry partners on a routine basis to give them the perspective as the government sees it in regards to some of the challenges that we are dealing with,” he said.

More than 200 people from both government and industry attended the luncheon to network and learn about CERDEC.

“RDECOM and CERDEC are important players at APG, and there are often requests from AFCEA members for leaders and directorate leaders to speak,” said Lexley Bender, AFCEA Vice President of Programs and business development director for DSA, Inc.

“We have eight lunches a year, and participate in other events,” Bender said. “We bring industry and government together for the needs of Soldiers, and I encourage active military and government to attend.”

RELATED LINKS

Army.mil: <http://go.usa.gov/rASH>

Seeking a safer pyrotechnic delay system

By Cassandra Mainiero
Picatinny Public Affairs

PICATINNY ARSENAL, N.J. — Although the term “pyrotechnic delay system” may be met with blank stares, such items are actually more commonplace than you may think. In fact, on the Fourth of July, they are an integral component of most commercial fireworks.

Pyrotechnic delays serve as “chemical timers.” In simple terms, a pyrotechnic delay is used to produce a time delay between two events, such as the time between when a firework is lit to when it expels its payload. For example the payload can be a colorful shower of sparks or an explosive charge producing a loud boom.

Pyrotechnic delays have also long been used in military munitions. One important example of the use of pyrotechnic delays is in Army hand-held signals for battlefield signaling and illumination.

Hand-held signals, such as the M159 white star cluster, contain a rocket motor and pyrotechnic payload inside an aluminum launch tube. When the primer at the base of the tube is struck, an initiating charge burns and ignites the rocket propellant. Hot propellant gases ignite the delay element that burns while the rocket is in flight.

After about five seconds, the delay element ignites an expulsion charge, which then ejects and ignites the smoke or illumination payload. The white star clusters in the M159 produce bright white light and burn for several seconds.

However, the problem with existing military pyrotechnic delays is that they contain toxic chemicals that are facing increasing scrutiny due to environmental regulations.

For instance, after munitions are used, chemical components from the delay system, such as chromates and perchlorates, remain on the residue. These residue chemicals can seep into the ground and cause ground water contamination.

To address this issue, physical scientist Jay C. Poret and chemist Anthony P. Shaw from Picatinny Arsenal have been developing environmentally friendly pyrotechnic delays. Poret and Shaw work at the Pyrotechnics Technology and Prototyping Division in the Energetics, Warheads and Manufacturing Technology Directorate. Their work has been funded by the Army Environmental Command's Environmental Quality Technology Program.

Their project started in 2010, when Poret and Shaw wanted to develop a new system with chemicals that are safer for the environment and for the manufacturers.



One of the chemical systems they considered was the “self propagating high-temperature synthesis,” or SHS, approach. This involves mixtures of two elemental metals, such as nickel and aluminum that react to produce nickel-aluminum alloy and heat.

However, because the starting metals and the alloy product readily transmit heat, the chemical reaction would not propagate when pressed into small metal tubes. The metal tubing would absorb the heat thus quenching, or stopping, the chemical reaction from propagating. For this reason, along with time constraints, this method was abandoned.

Instead, Poret and Shaw explored a more traditional approach based on pyrotechnics. This method was different from the SHS approach because it uses combinations of metal fuels and oxidizers versus two elemental metals. While the fuel is usually a metal, the oxidizer could be many different oxygen-containing compounds such as potassium nitrate.

Moreover, because pyrotechnic-based delays are primarily thermal insulators, they lose heat slowly, in contrast to SHS systems. This allows the pyrotechnic delay to burn more slowly without extinguishing, and allows munitions designers to develop items that generate the desired effect at the appropriate time.

“It’s been a very difficult project, probably one of the hardest things we’ve worked on,” Poret noted. “I think, because in the course of trying to develop entirely new chemical systems, there are a lot of physical and thermal factors we have to consider too.”

Aside from testing different environmentally

benign chemicals, another complicating factor was the “housing,” said Poret. The delay housing, or the tube that a delay mixture is placed in, can greatly affect how pyrotechnic delays function. How fast the delay burns is affected by many different factors, such as the type of material used to construct the housing as well as its geometry.

The size of the housing is also important because the tube’s diameter greatly affects heat flow in the system. For instance, when the diameter is narrow and the tube’s walls are thick, there is a higher probability that the reaction will be quenched, resulting in incomplete propagation, and item failure. “With pyrotechnic delays, it seems to be very easy to get them to burn quickly, but it’s a lot harder to get them to burn slowly and reliably,” Shaw said.

The team recently had a big success testing the new compositions in actual hand-held signals.

“We knew the systems we developed worked well in the lab, but there’s no substitute for the real thing,” said Poret. In recent field tests, delay compositions made by Poret and Shaw functioned well in the M159, releasing the white star clusters as intended.

“We were very excited about this successful test, since we plan to use the technology we’re developing in other military items,” said Shaw.

The next stage for the project includes testing to ensure long-term stability and reliability, as well as ensuring that the manufacturer can make the compositions in a reproducible way on a large scale.

Poret and Shaw expect the new delay compositions to be fielded in the hand-held signals within the next few years.



Annette LaFleur, team leader of the Design, Pattern & Prototype Team at Natick, Soldier Research, Development and Engineering Center, said that military clothing should be functional first but also have that 'cool factor.' (U.S. Army photo by David Kamm)

American fashion trends set by Natick?

By Bob Reinert
USAG-Natick Public Affairs

NATICK, Mass. — When it comes to fashion, America looks to, well, the Natick Soldier Systems Center, as it turns out.

At least that's the argument made by GQ. In an article entitled "Natick, Massachusetts: America's Fashion Capital," the venerable men's fashion and style magazine states its case for the home of everything U.S. service members wear.

"If America has made any lasting contribution to men's style, its (sic) utility: functional clothing," GQ wrote in a story posted to its website, Sept. 18. "And no one issues a louder clarion call for 'function' than the five-pointed Department of Defense."

GQ pointed to "the combat boot, the fatigue shirt, the camouflage print and the campaign desk, all items of veneration. We also got the T-shirt, popularized after the Spanish American War (1898). Today, we're calling attention to the G-1 flight jacket, first flown in the Korean War and

delivered continuously to market ever since."

"Nearly every New York fashion house produces a version of the G-1, but these are interpretations at best, and imitations at worst, of an American classic," GQ continued. "None is quite comparable to the leather original born four hours up the road in Natick."

High praise, indeed, but such compliments are not the main reasons those at Natick design apparel for America's heroes.

"Of course, everything designed for our war fighters must be fully functional," said Annette LaFleur, team leader of the Design, Pattern and Prototype Team at Natick Soldier Research, Development and Engineering Center. "The goal is to design clothing that enhances the user's ability to perform their mission, quality of life, and protection/survivability."

Yet, LaFleur admitted that style is a consideration, even for the military.

"Image also is very important for acceptability of an item," LaFleur said. "If we are designing a protective item, we want the user to want to wear

it; so the truth is, it has to look good and have that 'cool factor' to it."

LaFleur added that it takes "a huge team effort" at Natick to create those functional, acceptable items.

"Every day, it is something different for the war fighter," LaFleur said. "We make many design improvements to already fielded items and design brand-new clothing and items using written requirements and feedback from the field."

As to GQ's point about DOD's ability to produce functional clothing?

"Why wouldn't the general public want to have utility and functional clothing?" LaFleur said. "Utility in street fashion may serve many different purposes from how our war fighters need utility and function in their clothing."

"It is neat that the fashion designers and people on the street want to emulate the look of our finest men and women in uniform," she said.

RELATED LINKS

About Natick: <http://go.usa.gov/rJnB>



Soldiers from U.S. Army Europe's 1st Squadron, 2nd Cavalry Regiment, transport an injured soldier in a Stryker vehicle to receive medical aid for a medical evacuation exercise during the Immediate Response 2012 training event in Slunj, Croatia May 31. Magnetorheological suspensions have been researched and developed for use on the HMMWV, JLTV variants and the Caiman MRAP vehicle. (U.S. Army photo by Spc. Lorenzo Ware.)

Smart fluids improve suspension system performance

By Alex Kovnat
TARDEC Public Affairs

DETROIT ARSENAL, Mich. — Army researchers are always searching for new and innovative ideas to apply to ground vehicle platforms to make them more mobile, durable and survivable. A smart substance called Magnetorheological fluid, which can be applied to a vehicle's shock absorbers, may be one of the emerging technologies Army scientists and engineers can use to improve vehicle performance, maneuverability and durability.

MR fluids are referred to as "smart" because their consistency can be varied rapidly in response to changing conditions. They consist of magnetic particles such as iron, suspended in a carrier fluid with the particles occupying 20 to 40 percent of the total volume. When a magnetic field passes through the fluid, the particles align

themselves with the applied field, causing the fluid to become thicker. The viscosity change is nearly instantaneous and fully reversible.

This technology has important applications in ground vehicles, which the U.S. Army Tank Automotive Research, Development and Engineering Center and its partners in the Program Executive Office for Ground Combat Systems and PEO Combat Support and Combat Services Support have investigated.

MR FLUIDS IN EXPERIMENTAL SUSPENSIONS

Shock absorbers in most vehicles rely on a hydraulic fluid, a sliding piston and other parts that suffer wear and tear. In addition, the characteristics of a conventional shock absorber are either fixed, or else cannot be rapidly varied on demand. MR fluid is the enabling technology to design entirely new suspension systems that avoid these

limitations, leading to improvements such as reduced wear and tear and more reliability throughout the life cycle.

"Think of this as a 'smart shock,' one which can be turned on only when needed."

— Stephen Webb

LORD Corp. is the leading supplier of MR fluids in the United States. "The automotive original equipment manufacturers recognized the value of an adaptive suspension system utilizing [MR fluid in] dampers designed without moving parts," noted LORD National Accounts Manager Stephen Webb. "We began developing the adaptive suspension system for military vehicles after first realizing success in the automotive markets."

TARDEC's Ground Vehicle Power and Mobility Group's Track and Suspension Team, along with government and industry partners, have created semi-active suspension systems using MR fluids that have been successfully tested and demonstrated on a variety of Army platforms. These MR fluid-based suspension systems are an upgrade to modern suspension systems that minimize the impact of vehicle motions on its components and occupants.

“Adapting the system to work in severe off-road environments required big jumps in technologies. The peak forces are an order of magnitude larger.”

— Peter LeNoach

“The first area examined is ride quality, which translates to decreased warfighter fatigue, fewer injuries and less vehicle wear. Increasing vehicle safety is another, if not more important, aspect,” Webb said.

The MR fluid TARDEC uses is oil-based with micron-sized iron particles and has a consistency similar to house paint. When a magnetic field is applied, the iron particles line up and thicken the fluid. It is then in a semi-solid state with a consistency like putty.

MR-based suspension systems use the fluid in specially designed dampers, which take the place of standard dampers (shock absorbers). The MR damper contains the fluid and an electric coil, which generates a magnetic field that controls fluid viscosity at any given moment. The overall MR suspension system also consists of a controller that manages the strength of the magnetic field applied to the fluid.

“Think of this as a ‘smart shock,’ one which can be turned on only when needed,” Webb explained. When the suspension needs to be looser, the controller reduces the current to the coil, which relaxes the magnetic field and makes the fluid less viscous. If the suspension needs to be firmer, the controller increases the current, which makes the fluid thicker. Additionally, each shock is controlled independently, to provide the best overall control for the whole vehicle.

MillenWorks is a supplier for MR damper design, development and integration. “This controlled suspension fits into the same envelope as previous suspensions and can

interface with existing vehicle technologies,” explained MillenWorks Director of Suspension Systems Peter LeNoach. MR suspensions can be retrofitted into existing vehicle designs with little or no suspension modifications. Various options are available for installing these upgrades, including a vehicle's normal RESET periods and field-retrofits.

TESTING LAYS GROUNDWORK

Testing has been conducted on a number of vehicle types over the past 13 years. It started with a Small Business Innovation Research contract awarded to create a proof-of-concept High-Mobility Multipurpose Wheeled Vehicle modified with an MR-based suspension system in 1999. Since then, the Family of Medium Tactical Vehicles, Caiman Mine-Resistant Ambush-Protected vehicle and Stryker have all been outfitted with MR suspension systems. MR fluid-based suspension systems have also been considered for the Bradley Fighting Vehicle.

An increased focus on warfighter protection systems, particularly armor, has added to overall vehicle weight. This has presented significant challenges for engineers designing suspension systems for durability and performance. For example, the shocks in an HMMWV are about twice as large as those in a passenger vehicle. “Adapting the system to work in severe off-road environments required big jumps in technologies. The peak forces are an order of magnitude larger,” LeNoach observed.

DEMONSTRATING RESULTS

TARDEC's GVPM T&S team and its industry partners have discovered that the new suspension provides various efficiencies. The smoother ride, resulting from less energy being transmitted to the vehicle hull and occupants, improves vehicle component durability and crew responsiveness during target acquisition and engagement. The gains in chassis stability improve overall mobility, allowing the vehicle to traverse rougher terrain at higher speeds and perform more aggressive maneuvers without losing control or rolling over. Better handling and less travel time reduce risk to warfighters, and increase the effective life span of vehicles and components.

Results of MR suspension testing included up to 72-percent increase in cross-country speed, up to 60-percent reduction in peak vehicle shock/vibration levels, and up to 30-percent improvement in handling and stability by reducing vehicle roll rate,

specifically during the NATO Lane Change Maneuver Test.

FUTURE TECHNOLOGY TRANSITIONS

Researchers are conducting durability tests to show the technology works and will handle military environments. MR suspensions have been researched and developed for use on platforms such as the HMMWV, JLTV variants and the Caiman MRAP vehicle. The MR suspension has also been demonstrated on the Stryker platform.

Reinforcing the Army's efforts, the Office of the Secretary of Defense provided a Technology Transition Initiative in 2009 to accelerate MR fluid technology to align with the Stryker ECP Improvement Program, formerly referred to as the Stryker Modernization development and testing Program.

“The first area examined is ride quality, which translates to decreased warfighter fatigue, fewer injuries and less vehicle wear. Increasing vehicle safety is another, if not more important, aspect.”

— Stephen Webb

Testing has already been completed to validate MR suspension systems on the Stryker vehicles. Teams completed 4,000 miles of durability testing on an upweighted Medical Evacuation Vehicle variant at APG in April 2011, with zero failures. They also tested a Stryker Infantry Carrier Variant with an MR suspension system at Yuma Proving Ground, AZ. It was also tested Mobile Gun System Stryker variant. Testing showed the system is capable of stabilizing the MGS chassis and increasing performance. The MR suspension system tripled the Stryker MGS's maximum target tracking speed over a bump course. Mr. David Dopp, the project manager for the Stryker Brigade Combat Team agrees that, “the MR System provided greater platform stability and significantly reduced the shock and vibration transmitted to the Stryker crew and vehicle occupants.”

The technology has achieved Technology Readiness Level 7 (system prototype demonstration in an operational environment). “This is a good example of a fundamental change of technology through a concerted effort between industry and government to keep going and to realize benefits over the long haul thanks to patience,” LeNoach said.



Xingchu Li, an FPL Foods scientist, cuts a sample of osmotically dehydrated meat.



Dr. Tom Yang, an NSRDEC scientist, discusses uses of osmotically dehydrated meat products.



Stephanie Holmes, a food technician at the FPL Food's Cayce, S.C., processing plant, rolls a sheet of osmotically dehydrated meat product as it comes off the conveyor. FPL Foods has dedicated an area of its plant and members of its workforce, such as Holmes, in an effort to develop an array of innovative meat products. (U.S. Army photos by Tom Faulkner)

'Where's the beef?' -- DoD finds answers in new food process

By Roger Teel
RDECOM Public Affairs

CAYCE, S.C. — In a constant search of ways to improve military rations, the U.S. Army Natick Soldier Research, Development and Engineering Center, Department of Defense Combat Feeding Directorate is now partnering with a commercial industry partner here to develop a meat product that uses an innovative dehydrating process.

The meat is ground, then dehydrated, or cured, in a continuous osmotic dehydration process that is less expensive than producing beef jerky and has more health benefits, too.

Tom Yang, a senior food scientist on the Food Processing, Engineering and Technology team at the Combat Feeding Directorate, said the meat "tastes very good and will be available in a variety of flavors."

The meat product costs about one-third of a similar jerky-type product, an important consideration in an era of dwindling dollars. It

also has an estimated two- to three-year shelf life at ambient temperatures.

A FRENCH CONNECTION

The Association Pour Le Développement De L'Institut De La Viande, a French Technical Center for Meat, in Clermont-Ferrand, France, originally developed the continuous osmotic dehydration process. By investing in the equipment and developing the product, the DoD is delivering a new process -- and new products -- to American industry.

"About three years ago I went to the International Institute of Food Technologists Exhibition," Yang said. "A French company was marketing osmotic dehydration as a continuous process. This process is very novel, and I think, 'This has potential for application to military rations.'

"The First Strike Ration is designed for the first 72 hours of deployment -- so called 'eat on the move' ration. I think a product made from this new technology can be a very good

fit," Yang said.

"Commercial beef jerky tastes good, but it's very salty. And storing it at ambient temperatures for two or three years, it becomes dry and brittle," he said. The osmotically dried meat is more tender and moist, and could not only provide an alternative to traditional beef jerky but could also be used in a variety of other shelf stable ration components, such as sandwiches.

For funding, Yang submitted a proposal to the Foreign Comparative Testing Program managed by the U.S. Army Research, Development and Engineering Command's International Technology Integration Team for the Office of the Secretary of Defense, Comparative Testing Office.

"I was told this is the first time FCT has funded a project that wasn't related to weaponry or combat systems. Mine was the first one related to food. FCT was happy to fund this novel technology," Yang said.

PARTNERING WITH INDUSTRY

The Combat Feeding Directorate is partnering with FPL Foods, headquartered in Augusta, Ga., the largest integrated food processing company in the Southeast. The continuous osmotic dehydration processor was installed in May 2012 in FPL Food's Cayce plant.

Combat Feeding and FPL Foods are now developing an array of products with the new technology and recently drafted a cooperative research and development agreement to outline their efforts.

FPL Foods revamped an area in the Cayce plant to house the equipment and is supplying manpower to develop the products. Combat Feeding supplied the FCT funds to invest in the equipment.

"To our knowledge this is the only system like this in the United States," said Randal P. Garrett, chief operating officer for FPL Foods.

"For us to be competitive we have to be on the leading edge," he added. "We're in tune with what the DoD is trying to develop.

"We've done our initial development -- six runs so far -- and consumer marketing is coming, once we have a variety to show," he added.

Yang estimates the product will be ready for military test and evaluation in about eight months. "It's a very simple concept," Yang said of the process. "You take lean meat, and grind it up. This can be beef, poultry, pork, or even seafood, fish, or a combination, even fruit or vegetables."

Flavor and nutrients are added when the meat is being ground before it enters the dehydration process.

"The meat is extruded into a thin sheet on a sheet of parchment paper on a conveyor system. It is then pulled through an osmotic solution [composed of sucrose/sodium chloride/water] that extracts moisture," Yang said.

The finished product resembles a Fruit Roll-up, a candy item developed in 1983.

Garrett said the meat product has a quality that may redefine the jerky/meat stick market.

"Our initial thought was, 'Well, let's see if we can make a different jerky product,'" he said, explaining how FPL Food's vision has expanded. "Let's now try to produce something that's in great abundance. Let's look at fortified meat products for campers, hikers, those who are health conscious. There's also interest from folks looking for pepperoni and salad toppings.

"Grill or bake, the way we look at it, the only thing it wouldn't replace is a steak. That has unique properties," Garrett added.

"We have customers in the deli business who want to put it on their sandwiches, and restaurants for their salad bars," he continued.



Similar in appearance to a Fruit Roll-up, the osmotic process pulls moisture (cures) from the meat before pasteurizing it to eliminate bacteria. The meat can be flavored and supplemented with nutrients during the osmotic process.

"It lends itself to salad bars, with its long shelf life, and it's safe for consumers.

"It's healthy and nutritious and we can make it out of almost anything. We can use any type of meat and blend it together, [even] high Omega 3 products," Garrett said.

"We look at this as an opportunity to develop some meat products that people will like," he said.

"The osmotic process doesn't require a lot of input energy," Garrett added. "We're using a room-temperature solution to dry the product that doesn't require excessive energy, and we can reconstitute the solution and use it again.

"The ration teams have evaluated it, as well as the Warfighters, technical sensory evaluation panels, dieticians, nutritionists, and food scientists like myself. They gave it a critical evaluation and it ranked very high."

— Dr. Tom Yang

"We're looking to fit into our green space, to be better corporate citizens to our community, and being as friendly to the environment as we can," he added.

MANY MILITARY USES

Yang envisions many military uses for

the meat product.

"Warfighters like something that is meaty, tasty and healthy -- a high energy product," he said. "This will make a lot of product. It's very juicy, with whatever nutrient you want in there, and it will be well preserved."

"There's no heat involved, other than two minutes of pasteurization at 160 degrees Fahrenheit to remove bacteria and make it shelf stable. If it lasts three years, it will be a good fit for Meals Ready to Eat or First Strike Ration," Yang added.

The Combat Feeding Directorate ration teams are pleased with the product and its many potential applications to expand ration menus, according to Yang.

"The ration teams have evaluated it, as well as the Warfighters, technical sensory evaluation panels, dieticians, nutritionists, and food scientists like myself. They gave it a critical evaluation and it ranked very high," he said.

"The only challenge is they want more spice. They want a stronger flavor, like Tabasco sauce, teriyaki flavor, barbecue -- and this is very easy to do with this process," Yang said.

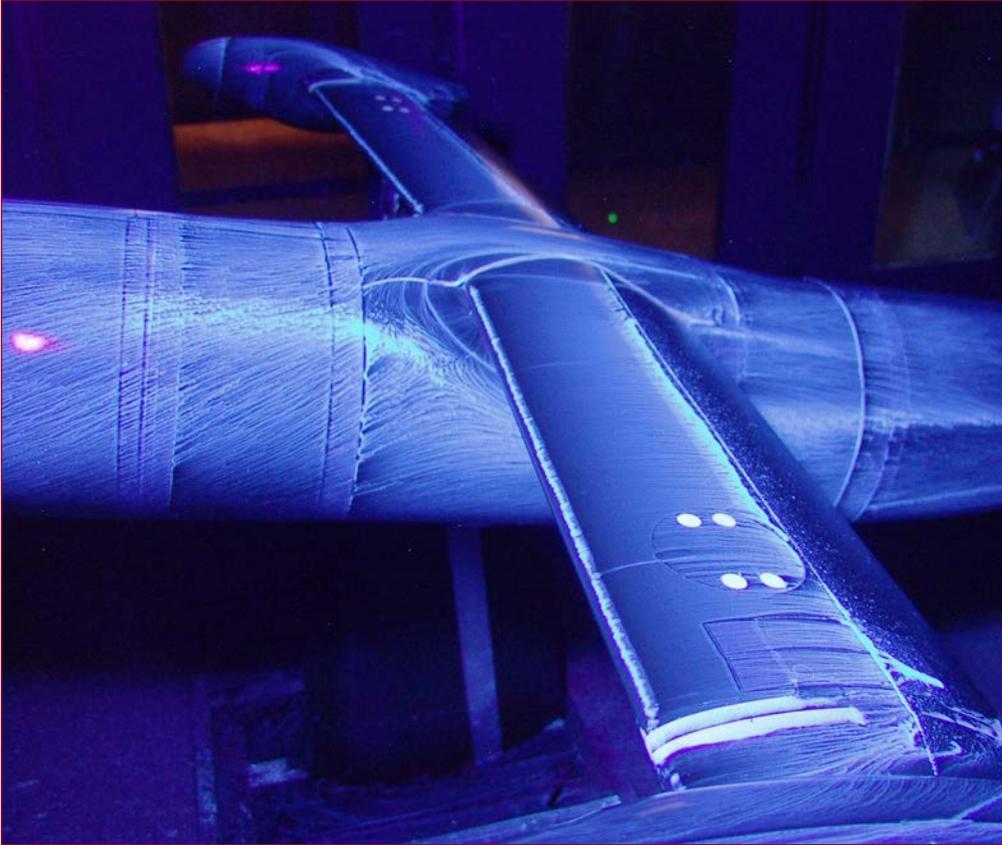
"We came up with salami flavor; it's very good. You can eat as it is or use it as a pizza topping. There is a chipotle flavor, too. A similar product made from turkey, called turkey jerky, was good. Pork and smoked ham enhance the flavor and that turned out very well."

Another product made from fish also impressed the dietitians.

"Of course, the recipe needs to be tweaked to make it less fishy," Yang added.

RELATED LINKS

Photos: <http://bit.ly/Tx5NwF>



Ultraviolet light is used to fluoresce oil during wind tunnel tests to aid in the visualization of surface flow and to identify flow transition and vortex locations. (U.S. Army photo by Brian Chan)

AMRDEC, NASA partner in wind tunnel testing of future aircraft

By Heather R. Smith
AMRDEC Public Affairs

REDSTONE ARSENAL, Ala. — The U.S. Army Aviation and Missile Research, Development and Engineering Center, in partnership with NASA, completed a wind tunnel test program examining two future aircraft designs: the Army High Efficiency Tilt Rotor and the NASA Large Civil Tilt Rotor.

The tests were conducted in the 7-by-10-foot wind tunnel, located at NASA Ames-Moffett Field, Calif. Data from the tests of the two airframe models, without rotors, are being used to generate validation data for computational fluid dynamics tools and for the development of flight dynamics simulation models.

The similarities between the Army and the NASA aircrafts allowed a significant amount of hardware to be shared, thus reducing costs. The models used the same support system and shared the same wing and nacelles; the fuselages, tails and wingtips were different but interchangeable between the two models. According to test director Ashley Pete, using

common hardware made it possible to carry out both tests with significantly less cost and time than would be necessary for two independent test programs.

Jeff Sinsay, principal investigator within AMRDEC's Aviation Development Directorate, said the Army's High Efficiency Tilt Rotor model is based on designs being evaluated for the intra-theater lift mission, as part of the ongoing Air Force and Army Joint Future Theater Lift, or JFTL, technology study.

The wind tunnel activity gathered sub-scale force and moment data that will be used to validate performance predictions made during the conceptual design process. Additional data was gathered on the flow behavior over a novel natural laminar flow tilt rotor wing airfoil, which promises improved cruise efficiency and reduced fuel burn, Sinsay said.

The tunnel is used for basic and applied research in aeromechanics on advanced and unique technology rotorcraft. It supports research on advanced concepts and on problem-solving for current rotorcraft. The test section of this wind tunnel has a maximum speed capability of 100 knots.



AMRDEC volunteers work on the roof of the Green's future home through a partnership with Habitat for Humanity of Madison County. (Courtesy photo by Ashley Erickson)

AMRDEC volunteers help with habitat

By Heather R. Smith
AMRDEC Public Affairs

HUNTSVILLE, Ala. — Firefighter Cory Green, his wife and son will soon take up residence in their new home built by U.S. Army Aviation and Missile Research Development and Engineering Center volunteers.

The volunteers spent several weekends finishing the home, which is a project of Habitat for Humanity of Madison County.

Dave Cripps, AMRDEC's Aviation Engineering Directorate deputy director and long-time Habitat volunteer, said this latest project takes a dilapidated, vandalized and foreclosed house and transforms it into a home.

Green is a city firefighter and moonlights as an emergency medical technician.

"I grew up in a bad neighborhood where my mom had to work three fast food restaurant jobs to support me and my three brothers," Green said. "This is an opportunity to not have my son be raised up like I was but with a home and a room all of his own. I'm just so appreciative that my wife and I can live in a home that family and friends helped us build."

Green said he has enjoyed working with the AMRDEC volunteers and is thankful that strangers would care enough to help him and his family. "It's a joy and honor to have them come help out in their spare time when they could be doing anything else," Green said.

AMRDEC's involvement in the project has had multiple benefits to both the community at large and the Army community on Redstone, Cripps said. It is a team-building activity for employees and a challenge for other organizations to get involved.

In 2011, more than 100 workers representing AMRDEC and the Redstone Community participated in a Blitz Build in Hackleburg, Ala. The team built four homes in two days in an area decimated by the April 27, 2011, tornadoes.



Before shipment to Afghanistan, a Bobcat T110 equipped with robotic controls, cameras, mine roller and rake system named the Minotaur is demonstrated at Redstone Arsenal, Ala. (U.S. Army photo by Merv Brokke)

Rapid reaction project protects dismounted Soldiers

By Heather R. Smith
AMRDEC Public Affairs

REDSTONE ARSENAL, Ala. — Dismounted Soldiers in Afghanistan needed help clearing paths and mitigating the risk of stepping on an Improvised Explosive Device. So the Army Rapid Equipping Force called for a speedy solution from the Aviation and Missile Research, Development and Engineering Center's Prototype Integration Facility.

Serving as the lead systems integrator, the AMRDEC PIF partnered with RDECOM's Tank and Automotive Research, Development and Engineering Center, the Robotic Systems Joint Project Office, the Maneuver Center School of Excellence, QinetiQ North America, Bobcat, and local vendors. The team's solution involved equipping a Bobcat T110 with robotic controls and cameras, and a mine roller and rake system.

In eight short months, the team worked the problem and had the solution on the ground and in the hands of Soldiers - the Minotaur.

Coogan Preston, the PIF Government Project Lead of the Minotaur IED Defeat

Operation, said the need was for a roboticized mine roller for dismounted operations. "We've got lot of dismounted operations going on," Preston said, "so that IED threat is now on the dismounted trails - small roads and trails that Soldiers operate in. They said, 'We need something that we can take to the fight with us. We don't need a big tank, we don't need a big MRAP style vehicle; we need something small that can we can go out three or four days at a time with before we have to have any kind of resupply.'"

Three Minotaur units were delivered to Soldiers in Afghanistan in October 2011, and feedback from Soldiers using it was very positive. So positive in fact, word spread and more vehicles were requested.

The Command Sergeant Major of one of the first Brigade Combat Teams to receive the vehicles sent feedback to Preston after the first wave of vehicles were delivered: "As soon as we received this equipment, we used the heck out of it. Great piece of equipment and did not fail us."

The Minotaur units have taken a couple of hits and performed well, Preston said.

They've had some of the front mine roller wheels blown off or a couple of the rake tines blown off. Most importantly, the vehicles are protecting Soldiers and saving lives by taking the hits for them.

The prime mover, the Bobcat T110, and the robotic applique camera systems are robust and ruggedized enough that we've not had any damage to those in the events. They've basically been able to bolt on new wheels and rakes and keep executing the mission, said Preston.

The PIF team delivers the equipment to the Soldiers, trains them how to use it, and has a sustainment contract as well.

"You don't want to put a piece of equipment over there and say, 'Here you go, see ya.' So as part of our effort, we're doing the full sustainment for the next year. We're fielding it, we're training it, and we're sustaining and maintaining the vehicles with the units through the end of FY13. The REF, the PIF, and the Robotics Systems Joint Project Office are working together for a transition to a program of record hopefully in FY14," said Preston.

By December, the PIF team will have shipped more than 65 Minotaurs to Soldiers in Afghanistan.

New technology, communication capabilities bring new challenges

By Joyce Conant
ARL Public Affairs

ABERDEEN PROVING GROUND, Md. — The U.S. Army Research Laboratory recently conducted a usability evaluation of the new planning functionality that has been implemented in automated communications engineering software. ACES is real-time, tactical network and planning software.

Five experienced ACES radio operators from the signal community were trained to use the new capability. The evaluation of the new module supported planning for the Soldier Radio Waveform and the Adaptive Wideband Networking Waveform. SRW is used by the Joint Tactical Radio System AN/PRC-154 Rifleman Radio and AN/PRC-155 Manpack Radio and ANW2 is used by the Harris AN/PRC-117G multi-mode radio. Users generated network data and created configuration files for the radio. One goal of the JTRS Program is to develop interoperable, mobile ad-hoc, secure networking for use by Soldiers anywhere in the joint battle space. JTRS will allow all elements of the U.S. defense force to communicate and share information over a fully interoperable tactical radio system.

Test participant Sgt. Maj. Haynes McCoy III, U.S. Army Forces Command Senior Spectrum Manager, said the training was geared to provide the operators with the knowledge necessary to plan, engineer, deliver and manage radio waveform files via an XML format. He said this capability ensures radio nets can be quickly established in all environments based on currently available electromagnetic spectrum resources.

After the training, participants followed a script to create the same SRW network plan that was used during Network Integration Evaluation 12.2. Chris Paulillo, usability evaluation lead of HRED, created the script and incorporated additional content to include ANW2 planning for the AN/117G and SINCGARS waveform planning for the AN/PRC-155.

“The ability to modify networks allowing access to joint, coalition and host nation forces will allow the commander the flexibility to maintain command and control over the force while simultaneously coordinating efforts with other forces in separate NETS [networks] as necessary,” McCoy said. “Drawbacks observed involved the inability to isolate a compromised radio and an automated IP management function for the operator, which would assist in ensuring there is no duplication of IP schemes during the development phase of the NET. HRED assured us that this issue



Chris Paulillo (left) points out information on a computer monitor to Chief Warrant Officer 4 Arthur R. DeLeon. (Courtesy photo)

would be reviewed in accordance with the requirements. The software was and the general concept and idea was great.”

The Program Executive Office Command, Control and Communications-Tactical is the network lead organization for NIEs, which include a series of semi-annual field exercises designed to evaluate deliberate and rapid acquisition solutions, as well as integrate and advance the Army’s tactical network.

Paulillo said they replicated data used by NIE with the objective to see if a trained and experienced ACES user could easily apply their ACES knowledge with minimal training to complete the tasks needed to plan network data and create configuration files for the radio. Also, data collected will be used to make system improvement recommendations and drive changes to the ACES application and user interface design.

New technology and communication capabilities bring new challenges to communication planning, Paulillo said. He said IP-based radios require a unique configuration file unlike the current force SINCGARS-capable radios and new radios must conform to new information assurance policies and regulations. There are different types of crypto-graphic keys used in these radios. He said while the concept and execution of planning and operation is different for JTRS, these radios can still operate as legacy radios such as a SINCGARS radio.

“I have supported ACES/JACS development and testing in the past through other customers, but this is the first opportunity that I have been able to conduct a usability evaluation,” Paulillo said.

He said one always learns so much more

when they have a functional system and have management’s support, but that the downside is that it can be labor-intensive especially when systems are immature or when they have not been fully integrated.

“I have never spent this much time preparing for a usability evaluation before,” Paulillo said. “I have worked a great deal with Diane [Quarles, also from HRED] doing this sort of thing in the past. Although she did not know a lot about the system, she is a quick study and if you have a good script to follow, you don’t need to be an expert on the system if you have experience like she has. Motivated users, a competent and responsive engineering, test and training team at the ready doesn’t hurt either. I had it all during this evaluation.”

Following the HRED script required users to exercise all ACES SRW and ANW2 planning functionality as well as some of the functionality required for current force radio network planning. Usability data was collected as Soldiers performed the required planning tasks that also included transfer of the data to the AN/PYQ-10 Simple Key Loader, management of cryptographic keys, and loading of radios.

The usability evaluation was conducted on a platform that hosted other network planning applications using the Windows 7 operating system and the Army’s Gold Master image. This usability evaluation demonstrated that multiple network management applications currently used today can run on a single target platform. HRED will supply usability test results to Communications Electronics Command Project Management offices and work with their engineers to mitigate the usability issues identified.



The rider in the front lost his left leg below the knee in Vietnam. The rider on the back was blinded in Iraq. Together they make a team. (Courtesy photo)

Army Engineer rides again to honor wounded Soldiers

By Amanda Rominiecki
CERDEC Public Affairs

ABERDEEN PROVING GROUND, Md.— An Army engineer is cycling in his second long-distance bike ride of the year to honor the nation's wounded warriors, after raising more than \$10,000 for a ride earlier this year.

David A McClung, an engineer for the U.S. Army Research, Development and Engineering Command's communications-electronics center, participated in the Ride 2 Recovery Minuteman Challenge.

McClung and the other 200 riders, wounded veterans and their supporters, cycled for six days through colonial Boston to Connecticut, across the Long Island Sound and north to West Point, N.Y., to complete the 330-mile Minuteman Challenge. The ride started Sept. 10 and ended Sept. 16 with a memorial ride at West Point. As they passed through New York City, riders stopped at Ground Zero and the National September 11 Memorial for a wreath-laying ceremony, according to the Ride 2 Recovery website.

"We were able to ride through the submarine base at New London late this afternoon," wrote McClung Sept. 12 in an update to family and friends about the ride through New London, Conn. "A few hundred

sailors and civilians were out to cheer us on. It always makes the miles easier."

McClung, 60, participated in the Ride 2 Recovery Don't Mess with Texas Challenge in April of this year, cycling 350 miles across Texas and raising more than \$10,000 for wounded veterans.

"It's a life changing experience to have the opportunity to ride any distance with a wounded warrior."

— David McClung

Ride 2 Recovery partners with the Military and Veteran Affairs Volunteer Service Office to raise money for cycling programs that benefit the rehabilitation of the country's wounded veterans through the Mental and Physical Rehabilitation program, said Maria Alvarado, a Ride 2 Recovery spokesperson.

"It's a life changing experience to have the opportunity to ride any distance with a wounded warrior," McClung said. "If you have the chance to do it, you absolutely should. It's so worthwhile to experience part of their journey."

RELATED LINKS

Army.mil: <http://go.usa.gov/rJsh>

Twitter



Go to <http://twitter.com/rdecom> to follow.

What's on RDECOM Twitter's feed?

@WestPoint_USMA RDECOM leaders had a great visit to the academy! Video: <http://youtu.be/VTBEafe8p8Q> and Story: <http://go.usa.gov/rFck>

#USArmy invests \$120 million in basic research partnership to exploit new materials <http://1.usa.gov/U6rznx>

#USArmy Army seeks 'operational energy' solutions for NIE 13.2 | Article | The United States Army <http://1.usa.gov/U6rj7R>

Robotic advances <http://storify.com/RDECOM/storypad> via @storify

The future is here <http://sfy.co/b5hj>
#storify the Army explores new energy sources! @CERDEC

We registered! New tool helps spot fake federal social media accounts <http://fcw.com/articles/2012/08/17/gsa-social-media-registry.aspx> ...

Lithium-ion battery is fast-charged in minutes <http://bit.ly/ONht61>

The U.S. Army RDECOM Daily is out! <http://bit.ly/OvFEeK> Top stories today via @DARPA

RDECOM has a free mobile app for both Android and Apple platforms:

***iOS:**
<http://bit.ly/RGN4h5>

***Android:**
<http://bit.ly/PACtFm>

Follow Army Technology news, information and social media all in one place!





Dr. John P. "Jack" Obusek becomes interim senior manager of Natick Soldier Systems Center in a Sept. 14 change-of-responsibility ceremony in Natick, Mass. (U.S. Army photos by David Kamm)

CONTINUED FROM PAGE 1

said McGuiness' new position was one "we put people in whom we have tremendous confidence in because they are incredibly good at getting the right stuff that we need for our Soldiers."

McGuiness thanked those in attendance for the way they supported him and his wife.

"I really did appreciate everybody, and I really enjoyed it," McGuiness said. "The time that Gail and I have spent here has been just fantastic, truly one of the most enjoyable assignments that we've ever had. Natick will always have a special place in our hearts."

Obusek urged the Natick workforce to continue its vital mission.

"We're here to provide the best technology and information that America can provide."

— Dr. Jack Obusek

"I want you to always keep in mind why we are here," Obusek said. "We're here to provide the best technology and information that America can provide to protect and sustain our sons and daughters, our brothers and sisters, and ... our mothers and fathers when we put them in harm's way to protect America's freedom and our way of life."

RELATED LINKS

Photos: <http://bit.ly/SiaHuw>



Brig. Gen. John J. McGuiness (left) addresses the change-of-responsibility ceremony in Natick, Mass.



Dr. John P. "Jack" Obusek and his wife poses following his assumption of responsibility as interim senior manager of Natick Soldier Systems Center in a Sept. 14 in Natick, Mass.

Social Media



Go to <http://twitter.com/rdecom> to follow also search @DaleOrmond and @CSMBeharie



Go to <http://facebook.com/USArmyRDECOM> — also search for Dale Ormond and Command Sgt. Maj. Beharie



Go to <http://bit.ly/rdecomgoogle>



Go to <http://flickr.com/rdecom> and http://flickr.com/rdecom_showcase



Go to <http://youtube.com/rdecom>

The INSIDER is an internal information product of RDECOM G5/Public Affairs
3071 Aberdeen Blvd., Room 103
Aberdeen Proving Ground, MD 21005
(410) 306-4539

G5 Director
Linda Longo
linda.longo@us.army.mil

Public Affairs Officer
Joseph Ferrare
joseph.ferrare.civ@mail.mil

Editor
David McNally
david.mcnally@us.army.mil

Please send us your feedback!