April 2016

NSSC This Month

U.S. Army Garrison Natick Public Affairs Office

High-tech Textiles

NSRDEC joins MIT in consortium

2013 and 2015 U.S. Army Maj. Gen. Keith L. Ware Awards - First Place, Digital Publication

Commander's Corner

Lt. Col. Ryan Raymond
USAG Natick Garrison Commander

Key Events Coming

Well, the weather is warming up and so is the OPTEMPO. The month of May is full of key events, as we engage in a joint anti-terrorism exercise with the Town of Natick (I ask for your cooperation during this event), conduct a mass turn-in of equipment to facilitate installation clean up, and host the IMCOM commander, Lt. Gen. Kenneth Dahl. The number one priority of the IMCOM commander is infrastructure, and we have the opportunity to show him some of the amazing work done here at Natick on behalf of the Soldier and also show him some of the improvements we need to our facilities.

I am thankful to everyone who participated in the SHARP campaign on the Command Channel. It was nice to see our team share their thoughts of what the SHARP program means to them. I also appreciate the great attendance at the FBI-led presentation on Human Trafficking; as national leaders, we all should be committed to protecting our children and others who cannot protect themselves. I appreciate your commitment.

With an eye toward Brig. Gen. Todd's vision for NSSC, "One Team Committed to Soldier Success," I want to congratulate our Public Affairs team on their success. This newsletter has stories that cover the accomplishments of many of the organizations across our installation. As you see on the cover, NSSC This Month is the best Digital Publication in the Department of the Army and has won two of the last three years. This month, NSSC This Month earned second place in the DoD Thomas Jefferson journalism competition. Congratulations to the team that is comprised of Garrison, USARIEM and NSRDEC professionals; a true example of success through teamwork.

As a Soldier, I thank you for what you do every day to give us every advantage on the battlefield and hope that each of you has a safe and successful month of May.

Lt. Col. Ryan Raymond
USAG Natick Garrison Commander

NSSC This Month

NSSC
Senior Mission Commander
Brig. Gen. Thomas H. Todd III

Garrison Commander
Lt. Col. Ryan Raymond

Command Sergeant Major
Command Sgt. Maj.
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About this newsletter
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On the Web: www.army.mil/natick

Cover photo: M. Scott Brauer, MIT News

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NSSC News Briefs ...

GEMS Summer Program

USARIEM and NSRDEC will be sponsoring the GEMS program once again this summer at Natick Soldier Systems Center.

The one-week paid extracurricular science education program enables students to experience science in a real laboratory setting. Participants will conduct interesting biology and chemistry experiments, receive interactive lectures on engineering, mathematics and new technology, and tour NSSC facilities to learn about exciting, ongoing research efforts.

GEMS 1: Session 1, July 5-8; Session 2, July 11-14
GEMS II: Session 1, July 18-21; Session 2, July 25-28
GEMS III: Session 1, Aug. 1-4; Session 2, Aug. 8-11

If you have a student who qualifies and is interested in participating, please email usarmy.natick.medcom-usariem.mbx.usariem-gems@mail.mil for more information.

Scholarship open season

Did you know that Army Emergency Relief offers an annual scholarship program for dependent spouses and children of active-duty and retired personnel? Did you know that last year AER awarded one spouse and eight children college scholarships to dependents at NSSC amounting to $19,800 locally, with more than $9 million awarded worldwide? Did you know that the AER scholarship application is open now to May 1, and can be accessed at www.aerhq.org? For more information, contact Diane Magrane, ACS Financial Readiness Manager, at diane.k.magrane.civ@mail.mil.

AER annual campaign

The Army Emergency Relief Annual Fundraising Campaign continues until May 15. Over the past 74 years, AER has provided $1.7 billion in needed financial assistance to Soldiers and their families. Unfortunately, in the past two years, the number of Soldiers donating to AER has fallen by 40 percent. Please consider supporting NSSC's campaign.

Flag Status

If you are looking for information about the flag status on the installation, you may go to the NSSC Portal home page at https://natiportal/default.aspx and click on the small waving flag next to "Today's Date." Or, you may go directly to the NSSC Flag Status Page at https://natiportal/garrison/DPTMS/Lists/Flag Status/AllItems.aspx, to see why and when it is being displayed at half-staff, along with the proclamation authorizing it.

Turn-in mission

The Logistics Readiness Center will be conducting an installation-wide turn-in mission beginning May 16.

The purpose of this mission is to mitigate the existing backlog of turn-ins and remove those items from the installation. This also includes containers. Please take this opportunity to review your backlog of excess by opening containers, storage areas and offices to turn in those items that are no longer required.

The LRC has set up a SharePoint site with a PowerPoint slide deck that illustrates specific instructions for submission, processing, approval and turn in. The link is https://natiportal/LRC/director/SM/default.aspx.

The POCs for this mission are John Ervin at 508-233-6479, or Donna Stok at 508-233-5562.

Main Gate closure

Continuing through Sept. 30, the Main Gate entrance will be closed for construction. During this time: All traffic will enter the installation using the Service Gate located at the end of General Greene Avenue; Between the hours of 6 a.m. and 6 p.m., all traffic will exit the installation using the Main Gate; Between the hours of 6 p.m. and 6 a.m., all traffic will exit the installation using the Service Gate; weekend entrance and exit will be through the Service Gate. Please direct all questions regarding the entrance/exit plan to the Law Enforcement Desk at ext. 4201.

Military family life

There is a Military Family Life Consultant assigned to the Town of Wellesley until the end of April who is available to NSSC active-duty Soldiers and their families. The MFLC program provides confidential, short-term counseling on or off the installation at no charge. Contact ACS for more information, or call the MFLC directly at (781) 206-6304.

Blood drive

The American Red Cross will host a blood drive April 29 from 9 a.m. to 2 p.m. at the Lord Community Activities Center, Bldg. 32. Potential donors can sign up at www.RedCrossBlood.org (enter sponsor code: 1744), or via the Blood Donor App. Please contact Katherine Lawler at katherine.lawler@redcross.org for more information.

Photos: David Kamm, NSRDEC Strategic Communications

Hall of Famer?

The time-tested Modular Lightweight Load-carrying Equiplment, or MOLLE backpack, which was developed at the Natick Soldier Systems Center for the Army and Marine Corps, has been named a finalist to the Carryology Hall of Fame.

According to the Carryology website: "Our Hall of Fame this year is reserved for the game-changers who broke the mould and declared 'Let's do it differently' – and our finalists are all worthy of lasting recognition for changing carry for the better."

USARIEM observes National Biomechanics Day

By Mallory Roussel, USARIEM Public Affairs / NATICK, Mass. (April 11, 2016)

High school students from Hopkinton, Massachusetts, toured the U.S. Army Research Institute of Environmental Medicine on April 7 as part of National Biomechanics Day.

The tour allowed students to learn how USARIEM's Military Performance Division researchers use biomechanics to improve performance and prevent injury in Soldiers.

"Many kids are unaware that the field of biomechanics exists," said Dr. Rebecca Fellin, a biomedical engineer from MPD. "By celebrating National Biomechanics Day, we can get the message out that you can use science and math in sports, performance and exercise, as well as injury research."

National Biomechanics Day is a nationwide event organized by the American Society of Biomechanics that aims to advance biomechanics science and education by increasing awareness and appreciation of the field. This year, about 80 biomechanics labs throughout the United States participated in the event by demonstrating biomechanics in its many forms to high school students and teachers.

During the day, Fellin, Dr. Joseph Seay, an MPD biomechanics researcher, and Dr. John Ramsay, from the Natick Soldier Research, Development and Engineering Center biomechanics group, led the students through three experiments. Students explored how researchers used biomechanics in jumping, landing and muscle sensor experiments. Three Soldiers, Sgt. Stephen Mason, Sgt. Czarina Rodriguez and Spc. Jiyo Torres, assisted the researchers with the experiments.

"I am hoping the students will be able to see that not only is science fun, but you can also answer important questions by studying how people move, especially in terms of injury and performance," Fellin said.

NSSC commander addresses AUSA chapter

By John Harlow, USAG Natick Public Affairs/ NASHUA, N.H. (April 11, 2016)

Brig. Gen. Thomas Todd III, the deputy commanding general of the U.S. Army Research, Development and Engineering Command and senior commander of the Natick Soldier Systems Center, spoke April 11 to the Col. Edward Cross Chapter of the Association of the United States Army in Nashua, N.H., about what NSSC does together as a team.

The general opened by noting that the Army has more than 180,000 Soldiers forward deployed. That's more than the total number of Marines in that service.

Todd spoke about how the science and technology community views its role in taking care of Soldiers.

"We have a saying across the Army that we don't man equipment, we equip the man," Todd said. "I am an Army aviator by trade, but I am a Soldier first, so that means I am a Soldier in an aircraft."

Todd compared the Army he entered with today's service. Both suffered for training dollars, equipment dollars and manning dollars. He referred to a Winston Churchill comment during World War II: Now that we are out of resources, now we have to think.

"We have a significant challenge ahead of us," Todd said. "We need to think together as we move forward."

In describing the mission of RDECOM and NSSC, Todd spoke of being sold something you weren't quite sure you needed, but after using it, you're glad you have it.

"Our job is not just to sell things and build things and convince you that you need it," Todd added. "It is to offer things to you that you might tell us that you can use. It is not to research without fault."

Photo: John Harlow, USAG Natick Public Affairs

Chapter president Greg d'Arbonne said it was extremely important to have Todd speak. "Everyone serving the military, no matter which component they belong to, is part of our military family," said d'Arbonne. "The general brought the message that we, and particularly the Army, are an integral part of the community, and people need to see and know we are in the community. The disconnect between the civilian population and our military is an issue."

Todd explained the Army Operating Concept and the role of RDECOM and NSSC play in it.

"Most people think of Natick, they think we develop MREs and textiles; that isn't the case if we do our job right," said Todd. "You ask us to take care of our Soldiers. To learn what they need from the skin in and skin out. We look at nutrition and the equipment that our Soldiers need to be successful.

"If we do our job right with human optimization and performance, it can help the Soldier and squad understand when they have reached the point of efficiency and peak efficiency and also when they start to reach the point of degradation. Our job is to measure the effectiveness of an Army squad and to know when an Army squad needs to be battle ready and when an Army squad needs to return to base to re-charge."

It is a change to the way the Army has operated over time, which was that you go with what you have.

"If we do our job right, we will be planting a seed that will help our sons, daughters, grandsons and granddaughters down the road," Todd said.

The Natick Soldier Systems Center is one team committed to Soldier success, not just today but in the future.

"We have pretty much created all of the battle gear that you wear today," said Todd.

"The goal one day is to have a uniform that adapts to the surroundings. We are creating textiles with three different polymers that are added together where one of them could be an antenna, one could be a Soldier charging cell, and one could be an infrared fiber to recognize friendly troops."

He also spoke of the cognitive performance of the Soldier and the research that Natick is performing to enhance that performance, base camp research, and some of the fibers being researched in base camps and uniforms.

"At Natick, we take care of our Soldiers inside and out," said Todd. "We accelerate the pace of failure so you can accelerate the pace of success. If we're not failing, we're not learning at Natick. If you're not learning, you're not moving."

Todd concluded by explaining that everything done at Natick is Soldier-centric. It has to be right for the Soldier now and anticipate what the Soldier might need next.

Wearing Many Hats

Inspired by heroic uncle, Smith dedicated to Soldiers

By Mallory Roussel, USARIEM Public Affairs / NATICK, Mass. (April 19, 2016)

Capt. Laurel Smith was 8 years old when her uncle, now retired Chief Warrant Officer Mike Durant, a Black Hawk pilot, was shot down in Mogadishu, Somalia, in October 1993.

When she and her family attended his homecoming at Fort Campbell, Kentucky, Smith developed an interest in the military and a desire to one day help wounded Soldiers recover from injuries similar to the ones sustained by her uncle, whose story was told in the 2001 movie "Black Hawk Down."

"I had an innate need to serve wounded Soldiers, but I did not know what I would do in the Army yet," said Smith, detachment commander and a principal investigator at the U.S. Army Research Institute of Environmental Medicine. "When I attended the University of New Hampshire, I thought I would get a teaching degree, join the Army, and be a teacher when I got out. I had this plan to serve and then fall back on a background in education."

While working as a student teacher in a traditional classroom, however, she found her true calling.

"When I was doing my student teaching, the teacher had me work with students with special needs, and I fell in love with it," Smith said. "I really wanted to work with kids with learning or other disabilities. My mom, who worked in the school, talked me into looking at occupational therapy as a career field. Occupational therapists work with individuals who, as a result of disease or injury, are not able to complete activities that promote functional and independent living."

According to Smith, while she envisioned working with children, she gradually saw a direct connection between occupational therapy and that childhood desire to help wounded Soldiers.

With a master's degree in occupational therapy from UNH in hand, she immediately joined the Army in 2008. After completing her Officer Basic Course in San Antonio, Texas, she reported to her first duty station, Tripler Army Medical Center in Honolulu, where she was assigned as a staff occupational therapist. After two years in Hawaii, she was deployed in Afghanistan to work as a concussion care specialist in support of an infantry brigade.

Capt. Laurel Smith

Smith said occupational therapy is a predominantly female profession in the civilian sector, but in the Army, the male-to-female ratio among occupational therapists is more equal. In her year in Afghanistan, Smith experienced a bit of "culture shock" while working in an infantry unit.

"While there were certainly a number of females, I worked predominantly with males," Smith said. "The majority of my patients were combat arms guys who received concussions outside the wire and were coming to me for their rehabilitation. Initially, there was a lot of unfamiliarity and challenges I had to overcome working with this population, but I think, in the end, it taught me a lot, and I believe (it) was a valuable experience for them, as well."

After her deployment, she was transferred to USARIEM to receive mentorship in scientific research. She started her first research project in musculoskeletal injury reporting. After three years as a principal investigator, she was asked to fill in as the detachment commander.

Smith described her job as "wearing many hats." No matter what hat she wears at the moment, however, she finds her job in USARIEM rewarding.

"I think the mentors who have reached out to help me are the true reason for my success," Smith said. "You are going to make mistakes. Going into a situation where you know adversity is inevitable is never comfortable, but I think it is how you grow and learn about yourself that determines your success.

"Women's History Month is a chance to celebrate those women who were courageous in the sense that they stepped up to the plate, took really tough jobs, and carved their way into fields they were not part of before. By doing that, they showed other women that with enough confidence and personal courage, success is possible."

Modern-day Slavery

Natick learns about sex trafficking during FBI presentation

By Tazanyia Mouton, USAG Natick Public Affairs / NATICK, Mass. (April 11, 2016)

Sex trafficking is a form of modern-day slavery that exists throughout the United States and globally. To bring more awareness to this issue, victim specialists from the Federal Bureau of Investigation spoke to the workforce of the Natick Soldier Systems Center, April 11. Lisa Solecki, a victim specialist with the FBI, said sex trafficking is occurring where we least expect it.

"I know many of us think that this is beyond us, but this is actually very much in our neighborhoods," Solecki said. "It's not just happening in a small sub-section of Boston, this is happening everywhere."

If you or someone you know is a victim of human trafficking, call the National Human Trafficking Resource Center at 1-888-373-7888.

Infographic: Tazanyia Mouton, USAG Natick Public Affairs

Photo: U.S. Department of Justice

In the Wind

NSRDEC advises UMass Lowell students on power project

By Jane Benson, NSRDEC Public Affairs/ NATICK, Mass. (April 4, 2016)

Sometimes a collaboration can be a windfall for all involved – especially if that collaboration involves helping college students to develop wind-power technologies that may benefit the Soldier in the future.

Students from the University of Massachusetts Lowell, who are preparing to enter a collegiate wind turbine design competition, looked to experts at the U.S. Army Natick Soldier Research, Development and Engineering Center and the U.S. Army Project Manager – Expeditionary Energy & Sustainment Systems for both business and technical advice.

Dr. David J. Willis, an associate professor of mechanical engineering at UMass Lowell, is leading the team of 18 business and engineering students, who are developing a wind-based energy generation system that uses a kite-based turbine. The students are looking to develop an off-the-grid energy solution.

"By making connections with real-world potential customers such as NSRDEC, the University of Massachusetts Lowell Collegiate Wind Competition Team was better able to understand the real-world product design and development process," said Willis. "NSRDEC personnel were instrumental in helping the students understand the Army's fundamental needs in renewable energy and in giving students a better understanding of actual deployment conditions and constraints. Ultimately, these discussions have driven the design of a novel wind energy solution that the students hope will impress the competition judges and potentially lead to a real product in the future."

The UMass Lowell team's wind turbine project is funded by a National Renewable Energy Laboratory Collegiate Wind Competition grant and the Massachusetts Clean Energy Center. (The team's work does not necessarily represent the views of these funding organizations.)

According to David Roy, an NSRDEC project director, NSRDEC guidance focused on technical challenges, functionality and user interface, transportability, development of technical data packages, and licensing rights.

"The students are from the engineering and business departments," said Roy. "They are working on a wind-based energy production technology that uses a kite. But in order for them to go into this multi-school competition, which is kind of like an academic "Shark Tank," they are looking at not just the engineering aspects of it but also the business aspects for their proposal submission."

Photo: University of Massachusetts Lowell

Chris Illsley, who is part of the Mechanical Engineering subgroup of the University of Massachusetts Lowell Collegiate Wind Competition Team, demonstrates the operation of the UMass Lowell collegiate wind-turbine, wind- tunnel prototype.

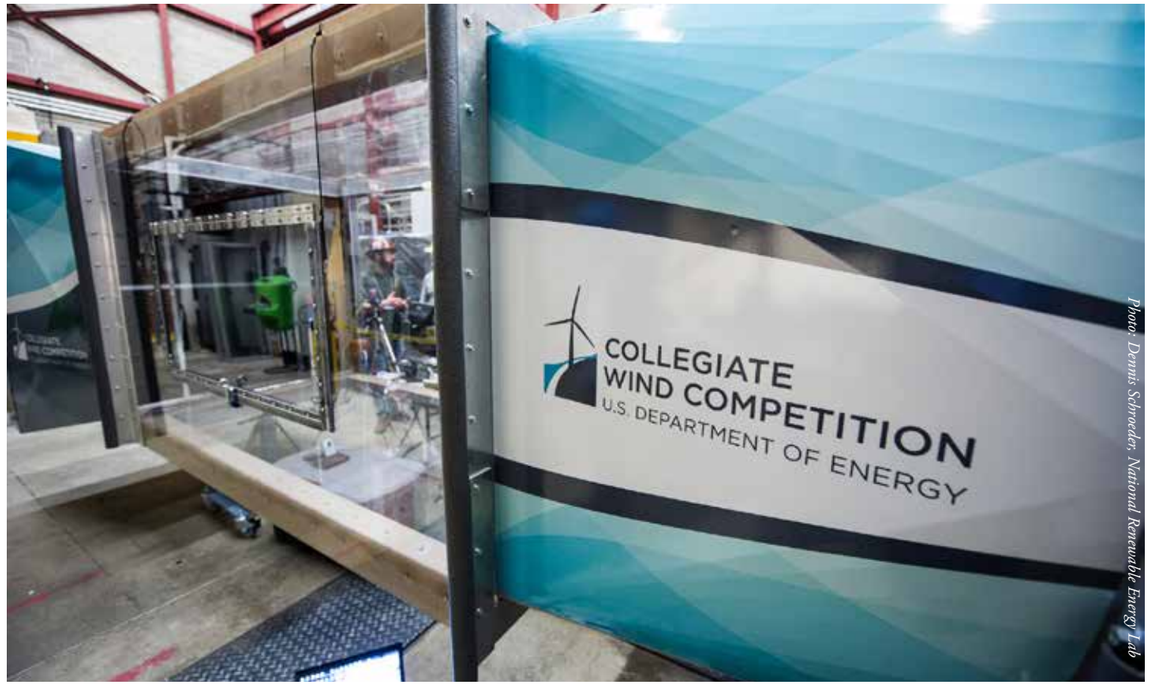

Photo: Dennis Schroeder, National Renewable Energy Lab

The technology the students are investigating can be applied to Army base camps in austere or remote environments.

"We were asked to provide some guidance for base camps since we are already working on a wind project," said NSRDEC's Laura Biszko.

"The students are working to develop an alternative source of reliable power," said Roy. "This type of technology would cut down on logistics and reduce the need to get fuel to Soldiers in remote environments. Along with the safety, logistics and environmental benefits of these types of technologies, they also help improve the operational endurance of small units in austere environments."

"We have an interest in renewable energy applications to enable base camps to operate more autonomously with fewer resupplies," said John Viggato, Assistant Product Manager, Shelter Systems. "Shorter logistic trains make for safer operations and put less Soldiers in harm's way doing resupplies. It enables the warfighter to be more self-sufficient."

The UMass Lowell team's wind project could potentially provide some valuable research for the Army's wind and renewable energy efforts. This technology could eventually be used at the squad level as an alternative to diesel engine generators 5 kilowatts and below. The technology may also have commercial applications, as well as applications for humanitarian and disaster relief.

"It's a holistic project," said Viggato. "It's allowing the student engineers the opportunity to take a technology they are developing and get a real-world application for it. It also allows the business majors the chance to develop a business plan to make a new technology viable and get it to market. Then, we as a potential customer can outline our specific needs as a possible direction for them to go. It brings all the organizations together."

NSRDEC's advising of the team is part of a larger joint research and development initiative between NSRDEC and UMass Lowell. Through a program called Harnessing Emerging Research Opportunities to Empower Soldiers, or HEROES, engineers and scientists from NSRDEC and faculty members and students from UMass Lowell are working together to solve complex scientific and engineering challenges to help improve life for the nation's warfighters.

"Partnering with academia is one of our cornerstones at NSRDEC," said Roy. "We are providing engineering and program management advice to an academic program. It gives the students positive reinforcement and access to information they might not have otherwise."

"HEROES is a win-win for all – win for NSRDEC scientists to tap into UML faculty, students, expertise and facilities to create new solutions to Soldier needs; win for UML faculty to apply their valuable academic research and expose their students to real-world military problems; and most importantly, a win for our Soldiers, who will be the benefactors of cutting-edge research and innovation to improve their safety, agility and sustainability in the field," said Lynne Samuelson, Ph.D., NSRDEC co-director of the HEROES program.

High-tech Textiles

National public-private consortium to involve manufacturers, universities, agencies, companies

By David L. Chandler, MIT News/ NATICK, Mass. (April 1, 2016)

An independent nonprofit founded by MIT has been selected to run a new, $317 million public-private partnership announced today by Secretary of Defense Ashton Carter.

The partnership, named the Advanced Functional Fibers of America (AFFOA) Institute, has won a national competition for federal funding to create the latest Manufacturing Innovation Institute. It is designed to accelerate innovation in high-tech, U.S.-based manufacturing involving fibers and textiles.

The proposal for the institute was led by Professor Yoel Fink, director of MIT's Research Laboratory of Electronics (RLE). The partnership includes 32 universities, 16 industry members, 72 manufacturing entities, and 26 startup incubators, spread across 27 states and Puerto Rico.

This is the eighth Manufacturing Innovation Institute established to date, and the first to be headquartered in New England. The headquarters will be established in Cambridge, Massachusetts, in proximity to the MIT campus and its U.S. Army-funded Institute for Soldier Nanotechnology, as well as the Natick Soldier Research Development and Engineering Center.

This unique partnership, Fink says, has the potential to create a whole new industry, based on breakthroughs in fiber materials and manufacturing. These new fibers and the fabrics made from them will have the ability to see, hear, and sense their surroundings; communicate; store and convert energy; monitor health; control temperature; and change their color.

The new initiative will receive $75 million in federal funding out of a total of $317 million through cost sharing among the Department of Defense, industrial partners, venture capitalists, universities, nonprofits, and states including the Commonwealth of Massachusetts. The initial funding will cover a five-year period and will be administered through the new, independent, nonprofit organization set up for the purpose. The partnership, which will focus on both developing new technologies and training the workforce needed to operate and maintain these production systems, also includes a network of community colleges and experts in career and technical education for manufacturing.

"Massachusetts's innovation ecosystem is reshaping the way that people interact with the world around them," says Massachusetts Gov. Charlie Baker. "This manufacturing innovation institute will be the national leader in developing and commercializing textiles with extraordinary properties. It will extend to an exciting new field our ongoing efforts to nurture emerging industries, and grow them to scale in Massachusetts. And it will serve as a vital piece of innovation infrastructure, to support the development of the next generation of manufacturing technology, and the development of a highly skilled workforce."

"Through this manufacturing innovation institute, Massachusetts researchers and Massachusetts employers will collaborate to unlock new advances in military technology, medical care, wearable technology, and fashion," adds Massachusetts Lt. Gov. Karyn Polito. "This, in turn, will help drive business expansion, support the competitiveness of local manufacturers, and create new employment opportunities for residents across the Commonwealth."

Announcing the new institute at an event at MIT, Carter stressed the importance of technology and innovation to the mission of the Department of Defense and to national security broadly: "The intersection of the two is truly an opportunity-rich environment. These issues matter. They have to do with our protection and our security, and creating a world where our fellow citizens can go to school and live their lives, and dream their dreams, and one day give their children a better future. Helping defend your country and making a better world is one of the noblest things that a business leader, a technologist, an entrepreneur, or a young person can do, and we're all grateful to all of you for doing that with us."

A new age of fabrics

For thousands of years, humans have used fabrics in much the same way, to provide basic warmth and aesthetics. Clothing represents "one of the most ancient forms of human expression," Fink says, but one that is now, for the first time, poised to undergo a profound transformation — the dawn of a "fabric revolution."

"What makes this point in time different? The answer is research," Fink says: Objects

Photo: M. Scott Brauer, MIT News

Humans have used fabrics in much the same way, to provide basic warmth and aesthetics. Clothing represents "one of the most ancient forms of human expression," Yoel Fink says, but one that is now, for the first time, poised to undergo a profound transformation — the dawn of a "fabric revolution."

Photo: Jeff Sisto, NSRDEC Public Affairs

Carole Winterhalter, a textile technologist at NSRDEC, speaks with Secretary of Defense Ash Carter April 1 at Massachusetts Institute of Technology in Cambridge, Mass., as Massachusetts Rep. Joe Kennedy, left, and Massachusetts Sen. Ed Markey listen.

that serve many complex functions are always made of multiple materials, whereas single-material objects, such as a drinking glass, usually have just a single, simple function. But now, new technology — some of it developed in Fink's own laboratory — is changing all that, making it possible to integrate many materials and complex functional structures into a fabric's very fibers, and to create fiber-based devices and functional fabric systems.

The semiconductor industry has shown how to combine millions of transistors into an integrated circuit that functions as a system; as described by "Moore's law," the number of devices and functions has doubled in computer chips every couple of years. Fink says the team envisions that the number of functions in a fiber will grow with similar speed, paving the way for highly functional fabrics.

The challenge now is to execute this vision, Fink says. While many textile and apparel companies and universities have figured out pieces of this puzzle, no single one has figured it all out.

"It turns out there is no company or university in the world that knows how to do all of this," Fink says. "Instead of creating a single brick-and-mortar center, we set out to assemble and organize companies and universities that have manufacturing and 'making' capabilities into a network — a 'distributed foundry' capable of addressing the manufacturing challenges. To date, 72 manufacturing entities have signed up to be part of our network."

"With a capable manufacturing network in place," Fink adds, "the question becomes: How do we encourage and foster product innovation in this new area?" The answer, he says, lies at the core of AFFOA's activities: Innovators across the country will be invited to execute "advanced fabric" products on prototyping and pilot scales. Moreover, the center will link these innovators with funding from large companies and venture capital investors, to execute their ideas through the manufacturing stage. The center will thus lower the barrier to innovation and unleash product creativity in this new domain, he says.

Promoting leadership in manufacturing

The federal selection process for the new institute was administered by the U.S. Department of Defense's Manufacturing Technology Program and the U.S. Army's Natick Soldier Research, Development and Engineering Center and Contracting Command in New Jersey. Retired Gen. Paul J. Kern will serve as chairman of the AFFOA Institute.

As explained in the original call for proposals to create this institute, the aim is to ensure "that America leads in the manufacturing of new products from leading edge innovations in fiber science, commercializing fibers and textiles with extraordinary properties. Known as technical textiles, these modern day fabrics and fibers boast novel properties ranging from being incredibly lightweight and flame resistant, to having exceptional strength. Technical textiles have wide-ranging applications, from advancing capabilities of protective gear allowing fire fighters to battle the hottest flames, to ensuring that a wounded soldier is effectively treated with an antimicrobial compression bandage and returned safely."

In addition to Fink, the new partnership will include Tom Kochan, the George Maverick Bunker Professor of Management at MIT's Sloan School of Management, who will serve as chief workforce officer coordinating the nationwide education and workforce development (EWD) plan. Pappalardo Professor of Mechanical Engineering Alexander Slocum will be the EWD deputy for education innovation. Other key MIT participants will include professors Krystyn Van Vliet from the Materials Science and Engineering and Biological Engineering departments; Peko Hosoi and Kripa Varanasi from the Department of Mechanical Engineering; and Gregory Rutledge from the Department of Chemical Engineering.

Among the industry partners who will be members of the partnership are companies such as Warwick Mills, NextFlex, Dupont, Steelcase, Nike, and Corning. Among the academic partners are Drexel University, the University of Massachusetts at Amherst, the University of Georgia, the University of Tennessee, and the University of Texas at Austin.

In a presentation last fall about the proposed partnership, MIT President L. Rafael Reif said, "We believe that partnerships — with industry and government and across academia — are critical to our capacity to create positive change." He added, "Our nation has no shortage of smart, ambitious people with brilliant new ideas. But if we want a thriving economy, producing more and better jobs, we need more of those ideas to get to market faster." Accelerating such implementation is at the heart of the new partnership's goals.

Connecting skills, workers, and jobs

This partnership, Reif said, will be "a system that connects universities and colleges with motivated companies and with far-sighted government agencies, so we can learn from each other and work with each other. A system that connects workers with skills, and skilled workers with jobs. And a system that connects advanced technology ideas to the marketplace or to those who can get them to market."

Part of the power of this new collaboration, Fink says, is combining the particular skills and resources of the different partners so that they "add up to something that's more than the sum of the parts." Existing large companies can contribute both funding and expertise, smaller startup companies can provide their creative new ideas, and the academic institutions can push the research boundaries to open up new technological possibilities.

"MIT recognizes that advancing manufacturing is vital to our innovation process, as we explored in our Production in the Innovation Economy (PIE) study," says MIT Provost Martin Schmidt. "AFFOA will connect our campus even more closely with industries (large and small), with educational organizations that will develop the skilled workers, and with government at the state and federal level — all of whom are necessary to advance this new technology. AFFOA is an exciting example of the public-private partnerships that were envisioned in the recommendation of the Advanced Manufacturing Partnership."

"Since MIT's start, there has always been an emphasis on 'mens et manus,' using our minds and hands to make inventions useful at scales that impact the nation and the world," adds Van Vliet, the director of manufacturing innovation for MIT's Innovation Initiative, who has served as the faculty lead in coordinating MIT's response to manufacturing initiatives that result from the Advanced Manufacturing Partnership. "What makes this new partnership very exciting is, this is for the first time a manufacturing institute headquartered in our region that connects our students and our faculty with local and national industrial partners, to really scale up production of many new fiber and textile technologies."

"Participating in this group of visionaries from government, academia, and industry — who are all motivated by the goal of advancing a new model of American textile manufacturing and helping to develop new products for the public and defense sectors — has been an exciting process," says Aleister Saunders, Drexel University's senior vice provost for research and a leader of its functional fabrics center. "Seeing the success we've already had in recruiting partners at the local level leads me to believe that on a national level, these centers of innovation will be able to leverage intellectual capital and regional manufacturing expertise to drive forward new ideas and new applications that will revolutionize textile manufacturing across the nation."

"Revolutionary fabrics and fibers are modernizing everything from battlefield communication to medical care," says U.S. Congressmen Joe Kennedy III (D-Mass.). "That the Commonwealth would be chosen to lead the way is no surprise. From Lowell to Fall River, our ability to merge cutting-edge technology with age-old ingenuity has sparked a new day for the textile industry. With its unparalleled commitment to innovation, MIT is the perfect epicenter for scaling these efforts. I applaud President Reif, Professor Fink, and all of the partners involved for this tremendous success."

The innovations that led to the "internet of things" and the widespread incorporation of digital technology into manufacturing have brought about a revolution whose potential is unlimited and will generate "brilliant ideas that people will be able to bring to this task of making sure that America stays number one in each and every one of these fields," said Senator Ed Markey (D-Mass.) at the MIT event. "The new institute we are announcing today will help ensure that both Massachusetts and the United States can expand our technological edge in a new generation of fiber science."

A wide range of industries are expected to benefit from these revolutionary fibers and textiles, including apparel, consumer products, automotive, medical devices, and consumer electronics. "Fibers and fabrics are ubiquitous," Fink says. "Our institute will go everywhere a fiber and fabric goes."

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Photo: Jeff Sisto, NSRDEC

Brig. Gen. Thomas H. Todd III , center, NSSC senior commander, and Doug Tamilio, right, NSRDEC acting director, attended the announcement at MIT.

NSRDEC to play key role in consortium

By USAG Natick Public Affairs

Natick Soldier Research, Development and Engineering Center will be an important part of the the Advanced Functional Fibers of America (AFFOA) Institute announced April 1 at MIT by Secretary of Defense Ashton Carter.

Brig. Gen. Thomas H. Todd III, commanding, Natick Soldier Systems Center, and Doug Tamilio, acting director, NSRDEC, both attended the event and came away impressed.

"So much of our history at NSSC is important to Soldiers of both today and tomorrow," Todd said. "NSRDEC's and MIT's collaboration in future wearable technology is just another step towards providing America's military the advantage it needs to win and come home safely. Very proud of all our great team members who make this possible."

"We are very excited about the opportunity for further collaboration with industry and academia, which will clearly benefit Soldiers by providing state-of-the-art innovations in revolutionary fiber technology," Tamilio said. "This effort will have a significant impact on the future readiness of the force."

The MILHUT is well-suited for austere environments because it is easily transported and can be set up quickly. It is primarily self-sufficient and relies on renewable energy technologies, such as solar power and water recycling.

Contain Yourself…

'MILHUT' provides comfort for Soldiers

By Jane Benson, NSRDEC Public Affairs/ NATICK, Mass. (April 15, 2016)

For Soldiers in remote locations, home is where the MILHUT is. The small shelter system provides a home-like environment while also reducing energy and water usage, as well as waste.

The Minimized Logistics Habitat Unit, or MILHUT, is a containerized shelter that relies on renewable energy technologies, which enable warfighters to be deployed longer in remote areas without the need for resupply. The MILHUT system provides habitat, hygiene and meal preparation capabilities that are not usually available with deployments to remote, austere areas.

The MILHUT is well-suited for austere environments because it is easily transported and can be set up quickly. It is primarily self-sufficient and relies on renewable energy technologies, such as solar power and water recycling.

The Army Natick Soldier Research, Development and Engineering Center's MILHUT is part of a larger Army effort called the Sustainability Logistics Basing, Science and Technology Objective -- Demonstration, or SLB-STO-D. The goal of SLB-STO-D is to reduce fuel, water and waste in expeditionary base camps.

The Army Research, Development and Engineering Command leads SLB-STO-D. It is managed by NSRDEC and co-managed by the Engineering Research and Development Center, or ERDC, Construction Engineering Research Laboratory, or CERL. Gregg Gildea is the NSRDEC lead for SLB-STO-D. A video summary of the SLB-STO-D can be found here: https://www.youtube.com/watch?v=SGDVBDzY3t4.

The MILHUT also reflects another goal of SLB-STO-D. The initiative not only aims to reduce energy use and waste, it also aims to improve or maintain quality of life. Preserving quality of life is an important factor in preserving Soldier readiness and morale.

Soldier input is key to ensuring quality of life is maintained. NSRDEC researchers are obtaining Soldier feedback on the MILHUT regarding quality-of-life items, such as showers and stovetops. Soldiers may live in the MILHUTS in remote areas, but NSRDEC researchers also want to find out if the new technologies and energy-saving capabilities work and interwork not only at this level, but perhaps also can be applied to a larger living environment in the future.

NSRDEC demonstrated MILHUT technologies at Fort Leonard Wood, Missouri, and allowed Soldiers to use the system in order to garner their input and insights.

"The things I liked most about it are the home functions that it makes available in an austere environment," said Staff Sgt. James Aron Goolsby. "It provides Soldiers a shower and a chance for extra hygiene while creating an area for them to feel comfortable in while away from home."

"I do like the fact that it brings more of the comforts of the home environment inside a field environment," said Spc. Dylan Smith. "For example, the shower, having hot water, being able to cook simple things, and the tent having temperature control so you don't have to spend the entire time either freezing or being extremely hot."

> "The things I liked most about it are the home functions that it makes available in an austere environment."
>
> Staff Sgt. James Aron Goolsby

Both Goolsby and Smith also thought that perhaps some items, including the microwave and clothes washer, were unnecessary.

"Things that an operational Soldier would prefer to see would maybe include a larger refrigerator or perhaps a larger shower," Goolsby said.

"The MILHUT is an innovative assortment of self-sufficient support and habitation equipment integrated into standard military shipping containers," said Chris Aall, the MILHUT project officer and a mechanical engineer at NSRDEC. "Its expedient quality allows for rapid deployment in austere environments, with the intent of reducing the troop-to-task ratio, and extending remote military operations with limited fuel and water resupply.

"The system exhibits solar energy capture, an on-board generator, a high-speed, low-flow laundry system, a waste remediating latrine, a shower with water reuse capability, and an efficient "kitchenette" in a compact form factor, supporting up to 20 warfighters. These inherent benefits aim to positively contribute to the SLB-STO-D objectives in making the U.S. Army more agile and efficient."

"Reducing base camp resupply operations saves lives," said Paul Carpenter, deputy, NSRDEC SLB-STO-D. "Understanding the relationships between fuel, water and waste is critical to reduce this demand for resupply. The SLB-STO-D analyzes these relationships through a Model Based Systems Engineering methodology. Technologies like the MILHUT also help the STO-STO-D better understand the art of the possible and how they can be extended to larger systems."

Up in ARMS

USARIEM develops mission-planning app for acute mountain sickness

By Mallory Roussel, USARIEM Public Affairs / NATICK, Mass. (April 19, 2016)

When Soldiers are suddenly hit with a wave of Acute Mountain Sickness while operating at high altitude, they might as well be considered casualties.

For anyone, working with nausea, fatigue and a throbbing headache is nearly impossible. Yet, the Army has never had technology to plan around the debilitating effects of mountain sickness--until now.

The U.S. Army Medical Research and Materiel Command has transitioned a mobile mission-planning tool, which was developed by U.S. Army Research Institute of Environmental Medicine researchers, directly to the field. The Altitude Readiness Management System, or ARMS, is an Android-based app that can predict how likely Soldiers are to experience mountain sickness and reduced physical performance at different altitudes and provides an acclimatization module to minimize these deficits.

> "ARMS does not do anything to prevent illness, but it helps commanders plan altitude missions with appropriate expectations. The good thing about ARMS is that it puts the planning tool in Soldiers' hands."
>
> Dr. Beth Beidleman, USARIEM

"ARMS is one of the first products by USARIEM ever fielded by the MRMC to a command," Dr. Beth Beidleman, the ARMS principal investigator, said. "Two commands are now using ARMS. One of them is the U.S. Army Forces Command, or FORSCOM, under the Program Executive Office Soldier program Nett Warrior. The other user is U.S. Army Special Forces."

Along with navigating steep, rocky terrains, abrupt exposure to high altitude can negatively affect Soldiers' physical and cognitive performance, as well as overall health. Altitude exposure lowers the oxygen supply to the body's tissues for a significant amount of time. Although the body is able to adapt to lowered oxygen levels over time at altitude, abrupt exposure endangers Soldiers' health and performance to the point that they may be unable to complete their missions.

"ARMS can be used to pre-plan mountain missions," said Beidleman of USARIEM's Thermal and Mountain Medicine Division. "If you use it as a planning tool, you can reduce the amount of people who are impacted by mountain sickness by either changing the ascent altitude, time of exposure or physical activity level or using Food and Drug Administration-approved altitude medication. If the mission can be altered prior to deployment based on this easily accessible information, ARMS can successfully improve Soldier readiness."

With Android phones in hand, commanders can use the three modules in ARMS to mitigate altitude illness, reduce physical performance decrements and plan altitude acclimatization.

"The illness module predicts the percentage of people that could get sick depending on the altitude," Beidleman said. "If a commander sends 100 people to 4,000 meters, ARMS will say, 'At 4,000 meters, 80 percent of Soldiers will get sick.' Commanders can plan for extra time or people based on the fact that 80 percent of our forces may feel under the weather."

ARMS also estimates whether the altitude sickness is mild, moderate or severe. Severe altitude sickness significantly slows down a mission and could result in casualties.

The percentage of Soldiers who suffer from mountain sickness can drastically impact the time to complete a mission that involves physical activity.

"If it takes Soldiers 100 minutes at sea level to complete a physical performance task, ARMS predicts it will take them 150 minutes at a 4,300-meter altitude," Beidleman said. "This allows commanders to appropriately plan enough time to complete certain missions."

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U.S. Army 1st Lt. Torrey Crossman, student, 41st Engineer Battalion, 10th Mountain Division, climbs the mountain at Smugglers' Notch in Jeffersonville, Vt., Feb. 18, 2016. The Mountain Walk is a culminating event for basic and advanced mountain warfare students to use the skills taught at the Mountain Warfare School.

Photo: Staff Sgt. Nathan Rivard, U.S. Army National Guard

The Altitude Readiness Management System application will give mission planners the power of more than 20 years' worth of statistical research on Acute Mountain Sickness at their fingertips.

Photo: Erin Bolling, USAMMDA Public Affairs Assistant

Up in ARMS, continued

Rapidly ascending to high altitude is a recipe for mountain sickness. However, commanders can use the acclimatization module in ARMS to see how long Soldiers should adapt to a lower altitude before ascending.

"It might not be acceptable for a commander to have 80 percent of his people sick," Beidleman said. "He might re-plan his mission and say, 'Instead of going straight to 14,000 feet, we will go to 8,000 or 10,000 feet for two days first, and then we will go to 14,000 feet. Now, I can decrease my likely mountain sickness level to only 30 percent of the troops.'"

Beidleman said the data in these three modules stem from over 25 years of altitude studies performed at USARIEM and recorded in their Mountain Medicine database.

"ARMS is a state-of-the-art tool that minimizes risk and increases effectiveness for Soldiers," Beidleman said. "Nothing like this has existed before, except for the Technical Bulletin Medical 505--a book--where you would search for this information. However, TBMED 505 is not user-friendly. Using ARMS, mission planners can plug in simple numbers to find out how many Soldiers are likely to get sick, the severity of their sickness, and the increased amount of time to perform physical tasks at a variety of altitudes. ARMS also provides an acclimatization tool to mitigate these deficits with the push of a button.

"ARMS does not do anything to prevent illness, but it helps commanders plan altitude missions with appropriate expectations. The good thing about ARMS is that it puts the planning tool in Soldiers' hands. They can push a button on an app and have easy access to critical information that can prevent detrimental hypoxic events from occurring."

Training in the heat

Maj. David Degroot, Ph.D., Aberdeen Proving Ground/FORT RUCKER, Ala. (March 21, 2016)

The very nature of our profession as Soldiers – training outdoors, wearing uniforms and carrying equipment – practically guarantees we will be exposed to heat stress. The latest data from the Armed Forces Health Surveillance Branch indicates that in 2014, more than 200 Soldiers suffered from heat stroke and another 1,200 suffered from other less severe forms of heat illness that required medical attention and led to lost duty time. It may be unrealistic to hope for zero heat illnesses, but through proper training, education and preparation we can minimize the number of Soldiers who suffer from a serious or even fatal heat illness.

The spectrum of heat illnesses includes dehydration, heat cramps, heat exhaustion, heat injury and heat stroke. Dehydration results when body fluid losses from sweating and urination exceed fluid intake. The cause of muscle cramps that occur during heat exposure is unknown, though electrolyte loss and/or dehydration likely contribute. During exercise in the heat, there is very high demand for blood flow to the exercising muscles and skin for heat dissipation. When this demand exceeds the pumping capacity of the heart, heat exhaustion may occur. Heat exhaustion is therefore primarily a cardiovascular event caused by exercise and often made worse by dehydration.

Heat injury and heat stroke are the most severe heat illnesses. Heat injury is characterized by organ (liver, kidney) and tissue (muscle) damage resulting from strenuous exercise and heat stress. When profound central nervous system dysfunction also occurs, heat injury has progressed to heat stroke. Common signs include loss of consciousness, combativeness and/or altered mental status. If not properly treated with aggressive cooling, heat stroke is potentially fatal.

The following items are some facts about working in the heat, as well as some commonly held beliefs that are simply not supported by facts.

Fact: Acclimatization to the heat is extremely important and represents what might be the most important thing Soldiers and leaders can do to prepare. Acclimatization results from moderate exercise in the heat; and while full acclimatization may take up to two weeks of two hours per day of exposure, most of the changes occur within the first five to seven days. Heat acclimatization causes body core temperature to be lower at rest and at a given exercise intensity. Sweating starts sooner and reaches a higher rate, so evaporative heat loss is increased. While acclimatization causes sweat to become more dilute (less salty), the increased sweat rate will increase fluid replacement needs. Unit leaders should plan time for Soldiers to heat acclimatize before engaging in higher-intensity activities.

Fiction: Heat illnesses only occur during the summer months, or the "heat season." While Soldiers and leaders at all levels are correct to expect increased heat stress during the summer, due to the clothing we wear, loads we carry and intensity at which we work, heat illness risk is present year-round. A recent analysis by the U.S. Army Public Health Center (Provisional) indicates that about 18 percent of all heat illnesses occur outside the heat season and there was not a single week during the calendar year when there was not a heat illness, including heat stroke. At some locations, 30 percent of all heat illnesses occurred outside of the heat season. It does not have to be hot for a Soldier to become a heat casualty.

Fact: Proper fluid replacement is important for preventing heat illness. Dehydration is associated with increased cardiovascular strain, lower sweat rate, lower skin blood flow and reduced exercise performance. When sweat rate and skin blood flow are reduced, heat transfer from the body to the environment is reduced, resulting in an increased core temperature. To estimate how dehydrated you are, step on a scale before and after exercise. If you weigh 150 pounds and lost 1.5 pounds during exercise, you're 1 percent dehydrated, which is of little concern. However, if you lost 4.5 pounds, you're 3 percent dehydrated. When dehydration exceeds 2 percent of body weight, physiological strain and risk of becoming a heat casualty increase.

Fiction: Fluid replacement is the only thing that is important for preventing heat illness. Data from the U.S. Army Research Institute of Environmental Medicine shows that only 17 percent of heat stroke cases were associated with dehydration. The reality is there are many contributing factors, including dehydration, as well as a Soldier's acclimatization status, physical fitness, medication and/or dietary supplement usage, and if they've recently experienced a viral infection (cold or flu). Focusing solely on fluid replacement may cause Soldiers to overlook other equally important risk factors.

Fact: Drinking water is preferable for rehydration. Sports drinks are effective but often not necessary, as long as Soldiers are also eating their meals, which typically contain enough electrolytes to replace those lost from sweating. Other beverages, including milk, coffee, tea and soft drinks, will also help a Soldier rehydrate; but due to the sugar content of some drinks, they should not be relied upon exclusively. In addition, they should not be put in canteens or hydration systems as they become harder to clean and foster bacteria growth. Drinking water and fully consuming meals will be sufficient to replace fluid and electrolyte losses.

Fiction: When a Soldier is too hot, he or she has heat stroke. In reality, a Soldier can have a high (greaterr than 104 F) core temperature and not be a heat stroke casualty. While high body temperature is suggestive of heat stroke, the presence of central nervous system dysfunction – not core temperature – distinguishes heat stroke from less severe forms of heat illness. The Soldier may display confused, combative, irrational or aggressive behavior, or may pass out. These are all strong indicators the Soldier is experiencing heat stroke and requires immediate medical attention and rapid cooling.

The risk of becoming a heat casualty exists year-round. By maintaining a high degree of physical fitness, proper body weight, acclimatizing to the heat and rehydrating appropriately we can each do our part to minimize the risk.

Photo: Staff Sgt. Christopher S. Muncy, Air National Guard

FAST Forward

Supporting Soldiers in the field

By Dan Lafontaine, RDECOM Public Affairs/ABERDEEN PROVING GROUND, Md. (April 18, 2016)

U.S. Army technology advisors gathered April 18-20 to discuss how the research and development community can better align with the service's future needs.

The Field Assistance in Science and Technology program's 30 advisers, both uniformed officers and Army civilians, are a link between Soldiers in the field and the Army Research, Development and Engineering Command's thousands of subject matter experts.

Brig. Gen. Thomas Todd III, RDECOM deputy commanding general, kicked off the annual FAST program review's three days of briefings, lab tours and discussions.

Scientists and engineers must demonstrate to senior Army officers how their work enables Soldiers' success, he said.

"We are fully nested with the Army Operating Concept and Army Warfighting Challenges," Todd said. "You live in a world of idea generation. You grow that into realistic technologies."

The AOC states the Army must ensure it has no near-peer competitors in technology, Todd said.

"RDECOM's mission is to maintain technology overmatch primarily in the mid and far term," he said. "If we're going to continue to innovate, we need S&T investment. You cannot take breaks in it. You lose intellectual capital.

"General Perkins (commander of Army Training and Doctrine Command) said we need to get after the rate of differentiation between us and our peer competitors. Be better, be different."

Army Chief of Staff Gen. Mark Milley testified before Congress that prototyping will be essential in the future, Todd said, and RDECOM is well-positioned to meet this need with prototype integration facilities at each of its research and engineering centers.

FAST's footprint reaches five combatant commands, 10 Army service component commands and major commands, three Corps (I, III, XVIII) and three combat training centers. Science advisers provide supported commanders with access to RDECOM scientists and engineers.

'Big 8'

Army Operating Concept will build future Army

By Supunnee Ulibarri, TRADOC/ HUNTSVILLE, Ala. (March 21, 2016)

Gen. David G. Perkins, commanding general of U.S. Army Training and Doctrine Command, discussed TRADOC's perspectives on "Big 8" initiatives and how the Army Operating Concept will build the future Army during the 2016 Association of the United States Army's Global Force Symposium at the Van Braun Center, March 17.

"As the Army looks to the future, the force will have to operate under a persistent climate of complexity," Perkins said. "The enemy also operates in this environment, and as a result, winning in a complex world means constantly evolving and repositioning the Army to provide enemies with multiple dilemmas, matched with multiple capabilities, through a higher rate of innovation."

Perkins stressed the importance of providing commanders on the ground with multiple options at the tactical, operational and strategic levels of war, but to do so requires the Army to innovate quicker.

"Innovating is not simply buying new equipment to better fight the enemy," Perkins said. "The Army doesn't need $1,000,000 solutions to $100 problems. We need $10 solutions to $100 problems."

Photo: Luc Dunn, AUSA

An important consideration is that the enemy is also changing and evolving at a rapid rate.

"If we buy a new tank, the enemy will develop a new threat to take out that tank. That's why we must innovate new capabilities that will keep us ahead of the enemy.

Perkins went on to explain eight capability areas TRADOC has determined the Army needs to increase its rate of innovation to stay ahead of the enemy."

These capabilities emerged from TRADOC's campaign of learning, using the 20 Army Warfighting Challenges, and require senior leader emphasis to synchronize across the services and industry.

The "Big 8" areas are: combat vehicles, expeditionary mission command, cross-domain fires, advanced protection, cyber electromagnetic, future vertical lift, robotics/ autonomous systems, and Soldier team performance and overmatch.

The world is changing and adversaries today have no set template for how they fight, and the Big 8 capabilities will help increase the rate of innovation giving an asymmetric advantage in future conflicts, according to Perkins.

"The Army does not buy things to fight, we develop capabilities to win in a complex world that is ever changing. This includes not only technology but also developing people – innovative professionals, who adapt quickly to changing threats," Perkins said. "The Soldier is the centerpiece of the solution."

The full video of Gen. Perkin's remarks at the Global Force Symposium is available on TRADOC's YouTube channel.

Photo: Sgt. 1st Class Nicolas Morales

MILITARY APPRECIATION MONTH

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