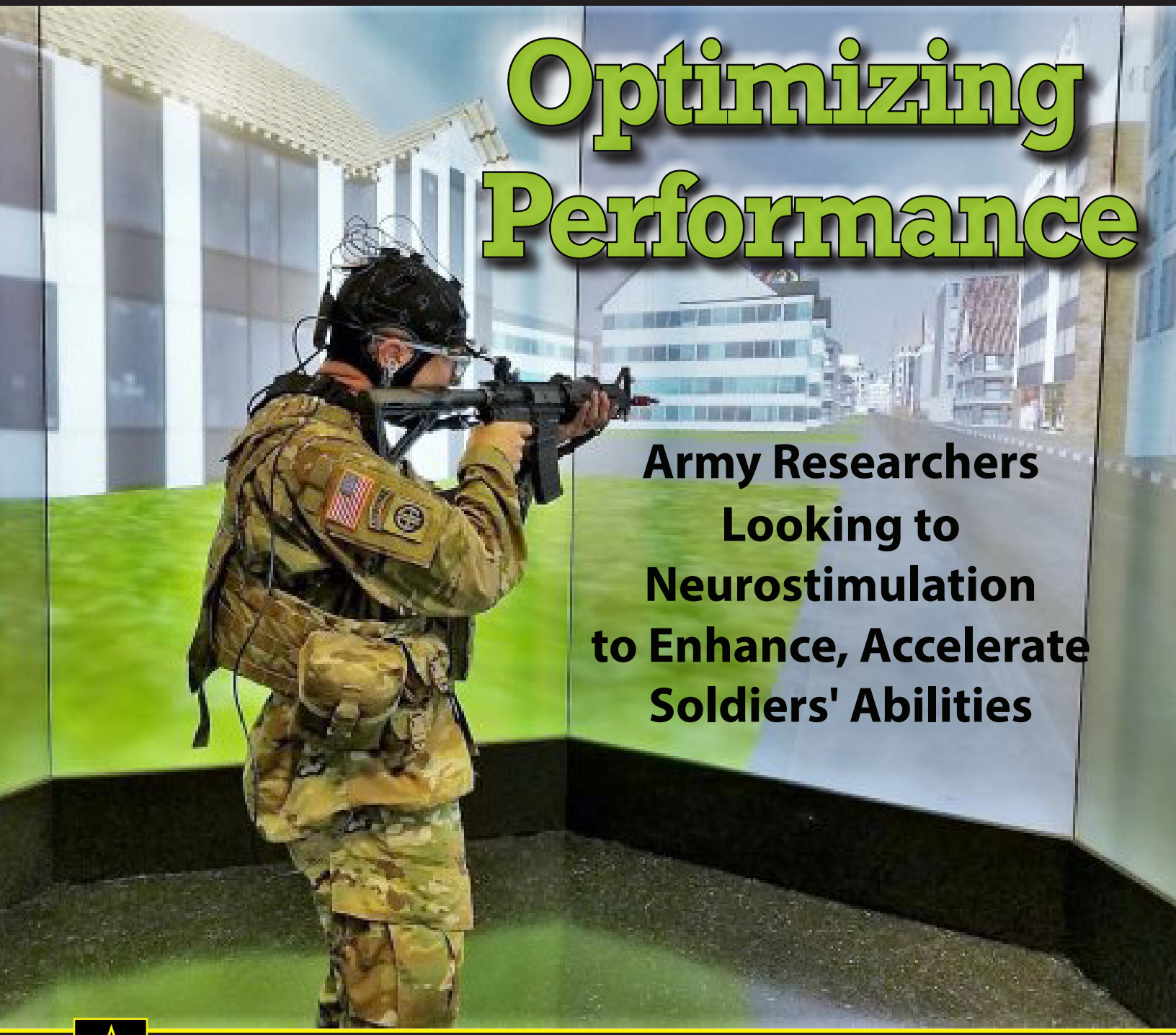
July 2018

# NSSC This Month

## Optimizing Performance

### Army Researchers Looking to Neurostimulation to Enhance, Accelerate Soldiers' Abilities

U.S. ARMY

**Installation Management Command**
**Maj. Gen. Keith L. Ware Awards**
**First Place, 2017, PDF Publication**

# Publisher's Note

John Harlow
*USAG Natick Public Affairs*

July sure has been interesting.

Some of you may have got to know Vannessa Josey, one of our Public Affairs Specialists. She also serves as a Staff Sergeant in the U.S. Army Reserve. She has been called on to deploy in support of operations overseas. Please keep Vannessa in your thoughts.

If you are looking for something to do this weekend, the Wall that Heals, the Moving Vietnam Memorial Wall will be on the South Shore this weekend on Union Point in Weymouth.

On Aug. 4, three teams representing NSSC will compete in Leapfest, the annual International Parachute Competition that takes place in Kingston, RI. The event is free and open to the public. For more information, go to www.leapfest.com.

We welcome Col. Sean O'Neil as the new commander of USARIEM and wish the best of luck to Col. Raymond Phua in his retirement.

We look forward to another busy month and telling the story of the Natick Soldier Systems Center.

Please contact me john.d.harlow.civ@mail.mil and we will tell your story throughout the Army.

Thanks for reading NSSC This Month.

John Harlow

Chief of Public Affairs/Legislative Liaison

USAG Natick

## NSSC This Month

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**About this newsletter**

*NSSC This Month* is a monthly newsletter covering NSSC news within the Army and commercial media.

*NSSC This Month* is maintained by the USAG Natick Public Affairs Office.

To subscribe to *NSSC This Month*, please contact Houston Waters at Kenneth.h.waters4.civ@mail.mil

Web: www.army.mil/natick

Cover story by Gary Sheftick, photo by David Kamm, NSRDEC

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*David Kamm, NSRDEC*



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# ANTITERRORISM VIGILANCE

Always Ready. Always Alert.

Because someone is depending on you.

*August is Antiterrorism Month*

August is the Army's annual Antiterrorism Awareness Month. This year's goal is to increase Antiterrorism "awareness" and "vigilance" across the Army.

Terrorism is an enduring, persistent, worldwide threat to our Nation and our Army, both domestically and abroad. Our goal must be to stay a step ahead of these threats and to do so we must focus our collective and individual actions on ""awareness" and "vigilance". By making these our watchwords, we will be better prepared to prevent and, if the situation arises, respond to terrorist activities.

During the past year, the Army's antiterrorism initiatives focused on leveraging the Combatting Terrorism Center, empowering Antiterrorism Coordinators, continual evolving threats, expanding community outreach and suspicious activity reporting. We must continue our vigilance with a renewed focus on evolving threats, such as active shooters, homegrown violent extremism, radicalization and cyber threats. Developing our knowledge base so that we can more clearly identify these threats, while developing preventive measures to counter them, is critical in defeating terrorism.

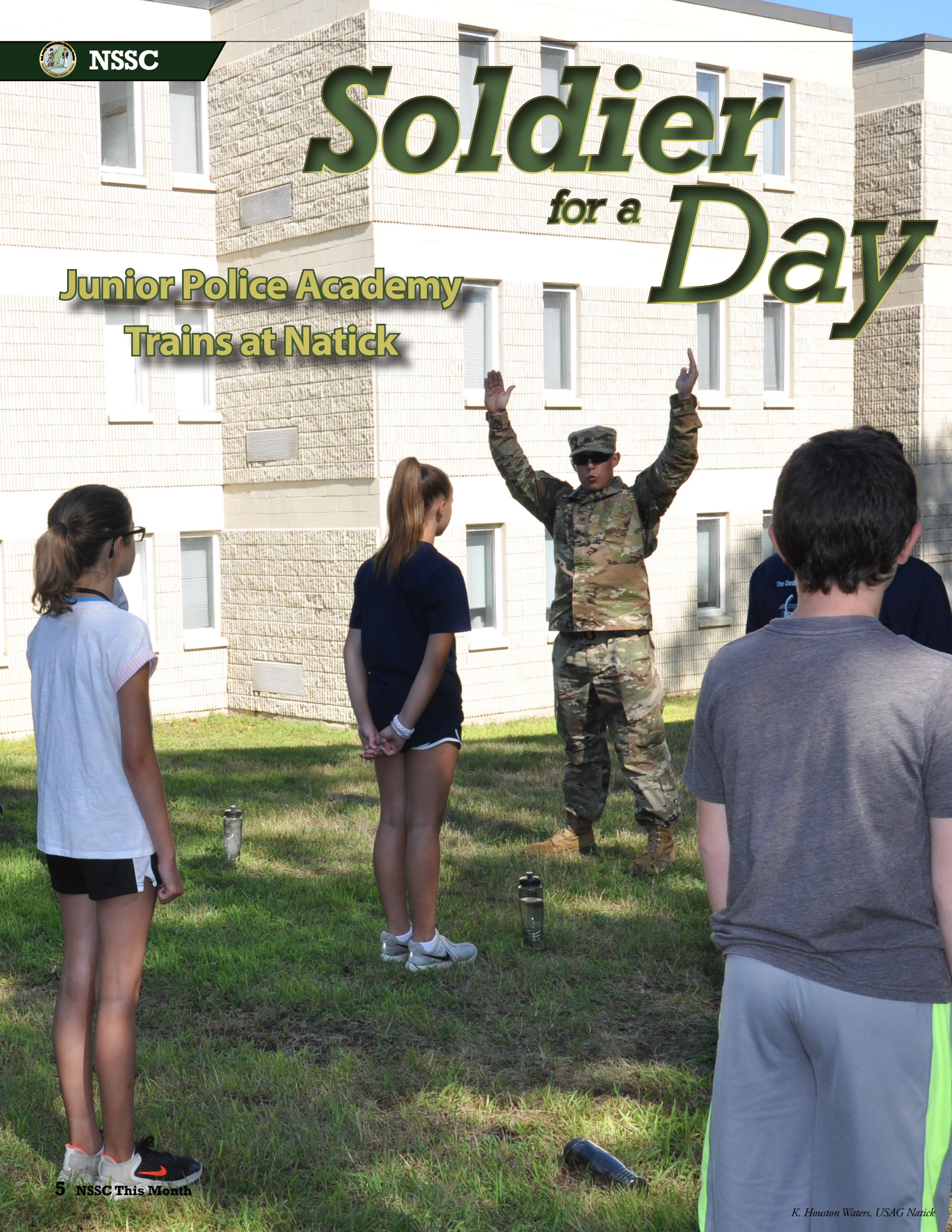
In addition, technological advancements, such as increased use of unmanned aerial systems and the increased sophistication of the operators behind them, present a new paradigm for how we must protect the information our adversaries seek to acquire and exploit. Such new tactics require all of us to remain actively involved in protection efforts.

During Antiterrorism Awareness Month and throughout the year, we encourage everyone to remain vigilant, report suspicious activity to appropriate authorities, and become familiar with active shooter response procedures.

Developing a greater awareness of the terrorist threat and a shared understanding of personal protective measures are vital to protecting and defending our people. Therefore, we encourage all members of Team Army to continuously assess their security posture while improving antiterrorism awareness and our vigilance. Working together, we form a united defense that strengthens and secures our nation. Army Strong!

# Soldier for a Day

## Junior Police Academy Trains at Natick



K. Houston Waters, USAG Natick

**By John Harlow, USAG Natick Public Affairs/Natick, Mass.**

The Natick Soldier Systems Center (NSSC) is one of the largest employers in Natick, MA, but to many in the community it's a secret place behind the fence.

"I grew up in Natick and didn't know what they did at the labs," said Officer Dylan Punch of the Natick Police Department. "I learned a lot about what happens at the labs and I know the kids did."

The 37 students of the Natick Junior Police Academy became Soldiers for a day as part of their camp experience.

They learned how Meals, Ready to Eat (MRE) are developed based on calories and weight restrictions, determined aircraft and glide ratios used in performing air drop missions and hydration and water filtration requirements that could be used during missions.

*Students participate in a ration-building excercise while visiting the Combat Feeding Directorate of Natick Solider Research, Development and Engineering Center (NSRDEC). (Photo Credit: Jeff Sisto, NSRDEC)*

The Soldier for a Day program is a Science, Technology, Engineering and Math (STEM) initiative funded and developed under the Natick Soldier Research, Development and Engineering Center's (NSRDEC) 2017 Bootstrap Program and has been expanded and further developed.

"The program offered students an interesting and fun way to learn about NSRDEC and become engaged in STEM at an early age," said Peggy Auerbach, a textile technologist with NSRDEC.

The students also went through a Soldier's physical training session and learned about the personal protective equipment for Soldiers, to include body armor, helmet and ruck sack.

*John Harlow, USAG Natick*

"The students made decisions on what to wear and carry while keeping in mind what impact these decision would have on their "Soldier" load," said Auerbach. "The kids seemed shocked at how heavy the vest with ballistic plates really is and enjoyed tasting some of the food that Soldiers eat when forward deployed."

The junior police academy gives the students an overall introduction to law enforcement as a possible career.

"The fastest route to become a police officer is by joining the military," said Punch. "Veterans have hiring preference and the transition from the military to law enforcement is much easier than coming off of the street. It is what I did when I joined the force."

It wouldn't be a day around the Army without picking up some acronyms. By the time the students left NSSC, they completely understood what PT, MRE and PPE meant and how it impacts the Soldier.

*K. Houston Waters, USAG Natick*

# Leading the Way

*Richard Walunas, NSRDEC*

## Natick's Cultivating Women's Leadership Group Hosts Women in STEM Speaker

**By Jane Benson, NSRDEC Public Affairs/Natick, Mass.**

The U.S. Army Research, Development and Engineering Command Soldier Center's Cultivating Women's Leadership group hosted Coryne Forest, the deputy director of Organization Development at the U.S. Army Research, Development and Engineering Command Ground Vehicle Systems on June 21.

Forest's talk centered on women working in science, technology, engineering and math, know as STEM.

Forest worked for 18 years as a project engineer. She eventually became a middle manager and then began her current position as the deputy director of Organization Development, focusing on fostering leadership.

The STEM career fields are still male-dominated. Forest pointed out the startling reality that half of the women working in STEM careers will leave mid-career due to a hostile work environment.

The type of hostility faced by women is usually not overt but rather a subtle undercurrent of condescension. Women in STEM are sometimes not given the recognition they deserve for their ideas or their ideas are sometimes not taken seriously. Thus, their contributions are often overlooked.

As part of this climate of condescension, women in STEM are sometimes expected to take on certain types of duties, including cleaning conference room tables, cleaning out the refrigerators, taking notes at meetings and planning office parties.

Forest said that businesses can help better retain women working in STEM by recognizing their contributions and by addressing the culture of condescension. Businesses can also improve retention by providing flexible work agreements, by allowing women to follow their career passions, and by giving women challenging but fair assignments.

Too often women face not only the glass ceiling but the glass cliff, where women in leadership roles are more likely than men to receive opportunities for leadership roles during times of crisis when the likelihood of failure is highest.

Forest's presentation was part of an ongoing effort by the center's Cultivating Women's Leadership group to explore leadership topics and provide employees opportunities to brainstorm, network and grow personally and professionally.

The group is led by Andrea St. George, an Organization Development specialist and Leadership Development program manager at the Soldier Center. The group also includes Sandra Hickey, deputy chief of staff for Intelligence and Security - G2, and Jen Rego, an research chemist.

St. George said the group is dedicated to building a "supportive community of professional women" who are devoted to "career development and professional/personal empowerment."

"We were so happy to partner with Coryne not just to support a collaboration between the RDECs but also because we were able to hear her talk about something she loves, is passionate about, and that she wants to inform the workforce about -- women in STEM," said St. George. "We were grateful for the opportunity to have her speak to our Cultivating Women's Leadership about this topic and share her very personal experiences of having a career in STEM, some of the unique challenges women experience during their careers and what support looks like for women during their careers."

# New Beginning

## USARIEM Welcomes 22nd Commander

By Mallory Roussel, USARIEM Public Affairs/Natick, Mass.

*Col. Sean O'Neil, right, accepts the unit colors from Maj. Gen. Barbara Holcomb, commanding general, U.S. Army Medical Research and Materiel Command, to assume command of the U.S. Army Research Institute of Environmental Medicine. (Photo Credit: David Kamm, NSRDEC)*

Col. Sean S. O'Neil became the 22nd commander of the U.S. Army Research Institute of Environmental Medicine, or USARIEM, in a June 10 change of command ceremony.

O'Neil took over from Col. Raymond L. Phua as Maj. Gen. Barbara R. Holcomb, commanding general, U.S. Army Medical Research and Materiel Command, or USAMRMC, presided. O'Neil previously served as the deputy medical acquisition consultant to the Army Surgeon General, and he recently graduated from the U.S. Naval War College in Rhode Island. Phua retired from the Army after 32 years of service.

At the beginning of O'Neil's military career, he once served as USARIEM's chief of logistics. Holcomb pointed out that in O'Neil, USARIEM was getting a commander who has a "genuine passion for Army medicine."

"Unlike other processes in life, we cannot interrupt the delivery of medicine to our warfighters," Holcomb said. "As a medical logistician, Sean lives in the real world of delivering reliable solutions to the Soldier and the clinician."

As he addressed his Soldiers and workforce for the first time as the USARIEM Commander, O'Neil said he was thrilled to return to Natick and the USARIEM team.

"As our Soldiers were prosecuting those wars, you all, the men and women of USARIEM, have dedicated your passions, talents, incredible expertise and special skills in order to improve warfighter health and performance," O'Neil said. "I've seen firsthand, everywhere I've been—at home station, at training events and while deployed—USARIEM's fingerprints are everywhere.

"I'm incredibly thrilled to have this opportunity to return as your commander. I pledge my complete commitment to you and our mission."

Holcomb recognized Phua's "diligent and unwavering leadership" of USARIEM during a busy two years in its history. In particular, Holcomb focused on Phua's support behind validating the effectiveness of the Occupational Physical Assessment Test, or OPAT.

"When Col. Phua became the commander here at USARIEM, he put his support behind another highly successful performance initiative: The OPAT test validation," Holcomb said. "This battery of four physical performance tests is what is now administered to all Army recruits to assess their physical performance capabilities to determine if they are fit to serve. The Training and Doctrine Command validated the OPAT this past year.

"In addition to a fifty million dollar cost savings in the first nine months, the data generated by this validation contributed to Army and Department of Defense policy changes that led to opening combat Military Occupational Specialties to female warfighters."

O'Neil also saluted Phua's two years of service at USARIEM and his 32 years of service to the Nation.

Phua said that he "was deeply honored to have served our country, the U.S. Army and USAMRMC as USARIEM's 21st commander." He noted that USARIEM has crossed many milestones over the past two years, including implementing new products such as the Performance Readiness Bar and wearable physiological status monitors, as well as beginning the groundbreaking of two new facilities that will enable USARIEM's mission to optimize warfighter health and performance: The Soldier Squad Performance Research Institute, or S2PRINT, in Natick and the new High Altitude Research Laboratory on top of Pikes Peak in Colorado Springs.

*Col. Raymond Phua, the outgoing commander, U.S. Army Research Institute of Environmental Medicine, or USARIEM, addresses the USARIEM workforce for a final time before retiring from the U.S. Army after 32 years of service. (Photo Credit: David Kamm, NSRDEC)*

In particular he mentioned the impact that the OPAT and the ARIEM Reduction in Musculoskeletal Injury, or ARMI, study, two of the largest data collections in USARIEM's history, will have on optimizing Army readiness.

"The OPAT is one of USARIEM's greatest accomplishments, as it affects every Soldier assessed in the U.S. Army," Phua said. "While the OPAT was wrapping up, USARIEM researchers were already leaning forward in the saddle, receiving institutional review board approval for the ARMI study, an effort to better understand who is more likely to get injured and what can affect injury risk. This multidisciplinary team of researchers is currently collecting bone and muscle data from four thousand recruits as they go through basic combat training. They are following the recruits during the first few years of their military careers. This data collection is part of a four-year longitudinal study. I predict it, too, will someday be as influential in shaping how a Soldier physically trains.

"Col. O'Neil, your bibliography speaks for itself. You are no stranger to the USAMRMC family or to USARIEM, having previously served as deputy commanding officer at USAMMDA, as well as chief of logistics at USARIEM. Your previous leadership experience will serve you well. It will be called upon as you guide this great organization to achieve new milestones."

In her closing remarks, Holcomb praised the people who work in USARIEM.

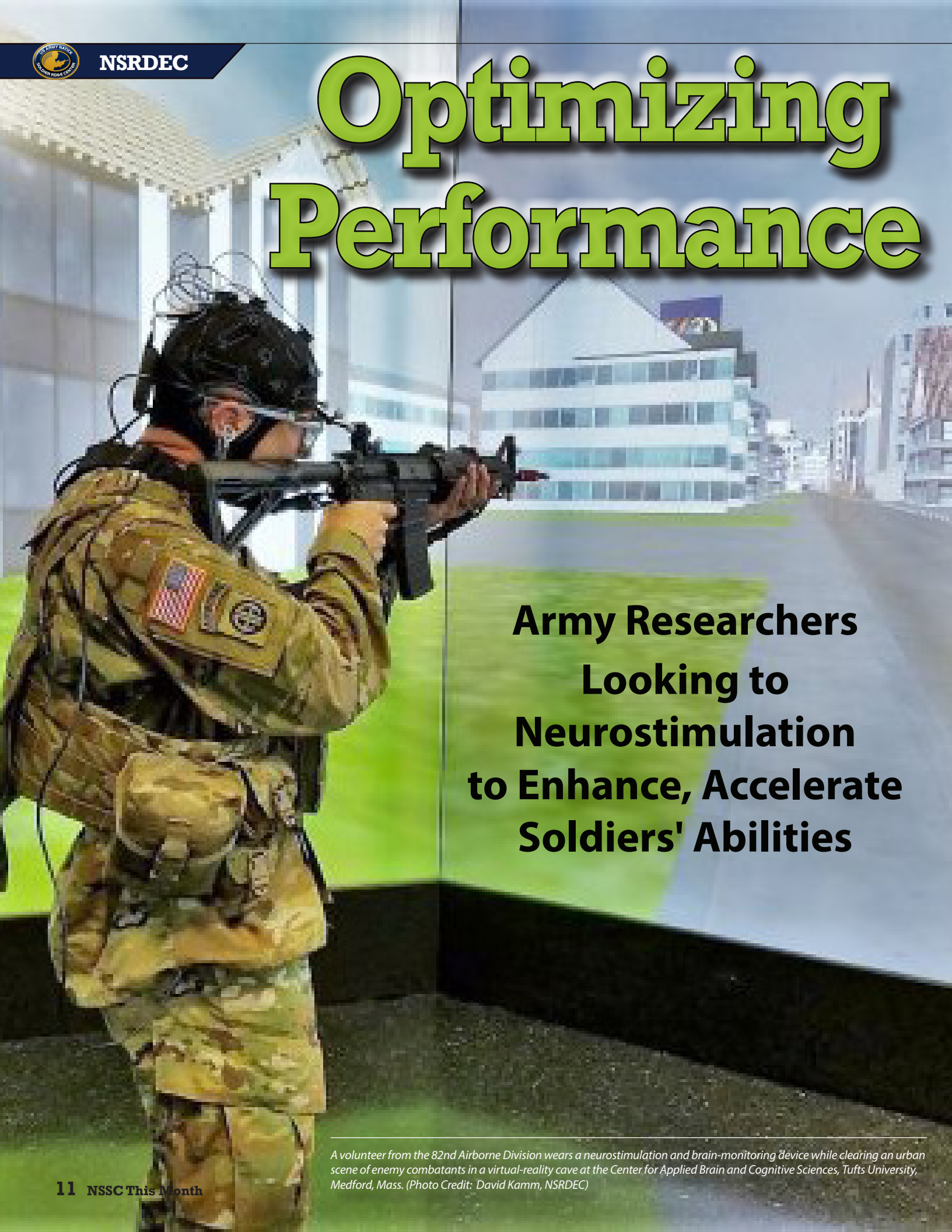
"Environmental medicine is an essential precursor to readiness," Holcomb said. "The team at USARIEM is phenomenal, and I want to take a moment to honor all Service Members, civilians and contractors who come together to support this important mission. Thank you for the work you do, which makes a profound difference for Service Members and for the success of military medicine."

# GEMS Summer Program July 16-19


*Lauren Francis, a college student at Worcester Polytechnic Institute (WPI), provides instruction on blood typing to Gains in the Education of Mathematics and Science (GEMS) students at Natick Soldier Systems Center (NSSC). The summer program, sponsored by the U.S. Army Institute of Enviornmental Medicine (US-ARIEM), provides labratory experience to middle-school aged students. (Photo by K. Houston Waters, USAG Natick).*

# Optimizing Performance

## Army Researchers Looking to Neurostimulation to Enhance, Accelerate Soldiers' Abilities



*A volunteer from the 82nd Airborne Division wears a neurostimulation and brain-monitoring device while clearing an urban scene of enemy combatants in a virtual-reality cave at the Center for Applied Brain and Cognitive Sciences, Tufts University, Medford, Mass. (Photo Credit: David Kamm, NSRDEC)*

**By Gary Sheftick, Army News Service/Washington**

Can the Army produce faster, stronger and smarter Soldiers through electrical stimulation of the brain?

Neurostimulation is not actually a process the Army intends to use for creating "super Soldiers." However, Army researchers have been experimenting with it as a means to accelerate training.

"We've seen a lot of positive effects of neurostimulation in our lab," said Dr. Tad Brunye, senior cognitive scientist at the Natick Soldier Research, Development and Engineering Center, known as NSRDEC, in Natick, Massachusetts. He heads up neurostimulation research there along with Dr. Erika Hussey.

Brunye and members of his staff were in the Pentagon courtyard May 23-24 during a Close Combat Lethality Tech Day.

Brunye has been experimenting with neurostimulation at Natick over the past four years and at the nearby Center for Applied Brain and Cognitive Sciences in Medford, Massachusetts. The center was created in 2015 through a partnership between the Army and the School of Engineering at Tufts University. It is co-directed by NSRDEC's Cognitive Science and Applications Team along with Tufts faculty.

The center includes what Brunye calls "large virtual-reality caves."

Volunteers at the center receive low-intensity electrical current through headphone-style stimulation systems or electrodes mounted on what looks like a bathing cap. Then their performance in the virtual-reality environment is measured. Neurostimulation has shown the following benefits:

-- Increased ability to recognize suspected terrorists from a list of faces studied hours earlier during neurostimulation.

-- Improved navigation performance, especially for individuals with lower spatial abilities. Soldiers in large-scale virtual urban environments did better moving between objectives during neurostimulation.

-- Increased attention span. Attention might wane after 20 minutes when watching a security monitor and neurostimulation could increase that attention span to 20 hours.

*Dr. Aaron Gardony, cognitive scientist at the Natick Soldier Research, Development and Engineering Center, points out the type of headset that is normally used for neurostimulation research. The cap consists of electrodes that can stimulate specific parts of the brain to enhance concentration or performance. The cap and other neurostimulation devices were on display in the Pentagon courtyard for Close Combat Lethality Tech Day, May 23-24, 2018. (Photo Credit: Gary Sheftick, Army News Service )*

*Army Chief of Staff Mark A. Milley tries on a headset that is providing neurostimulation from a wireless transmitter. The stimulation is not going through his ear pads, but instead through an array of small flexible inducers along the adjustable headband. (Photo Credit: David Kamm, NSRDEC)*

-- Enhanced motor skills, such as the standing broad jump, when a particular area of the brain is stimulated during practice.

"We want to make sure that we stimulate the right areas of the brain, at the right time, in the right individual, in a manner targeted to specific tasks that we need them to excel on," Brunye said.

"The consumer market is exploding with do-it-yourself brain stimulation devices right now, and Soldiers are willing to try just about anything to enhance their mental and physical performance," Brunye continued. "But we need to be sure that any commercial claims are supported by rigorous experimental science, and that the systems are being used only in appropriate and beneficial ways. Our science and technology efforts are helping ensure that is the case."

CREATING HIGH PERFORMERS

Soldiers from a variety of military occupational specialties volunteer to come to Natick immediately following their initial-entry training, Brunye said. They serve about three months at Natick before moving on to their first unit. These Soldiers are used in the experiments, along with volunteers from local communities around Boston.

The volunteers feel just a tingling, itchy sensation on their scalp during the neurostimulation, he said.

"In terms of long-term impact, there are no known negative or adverse effects of neurostimulation," he said.

Neurostimulation will help accelerate learning and can bring Soldiers up to a level of high performance quickly. "It will compensate for some of the variability we see" during learning, Brunye said.

The effects of neurostimulation, however, are less noticeable on those who are already high performers on a specific task, he said. In fact, neurostimulation can sometimes have a slightly detrimental effect on high performers. Those individuals already have a fine-tuned system for completing a task and neurostimulation will help them wire a new neuron highway for that task -- one that may not be initially as effective, he explained.

INNOVATIVE PARTNERSHIP

The Army signed a five-year cooperative agreement with the Tufts School of Engineering almost four years ago and established the Center for Applied Brain and Cognitive Sciences.

"It's a very unique reciprocal relationship we have with the university," Brunye said.

The university provided the physical facility and infrastructure, such as the heating and cooling systems, networking, and computer hardware and software. Tufts also provided personnel for manning the facility and post-doctoral researchers to help run it.

The Natick Soldier Research, Development and Engineering Center -- part of the Army's Research, Development and Engineering Command -- provided everything else. The virtual reality programs all came from Natick.

About half of the participants in experiments at the center are Soldiers, Brunye said.

The neurostimulation is provided via a wireless device. Much was learned from experiments that involved searching and clearing buildings over the last five months, he said. In these experiments, neurostimulation began about five minutes before a task and continued through the task, Brunye said.

The voltage varied from 7 to 18 volts, at very low amperage (usually between 1 and 2 milliamps). Direct current is the norm, but the lab is beginning to use alternating current to target more specific areas of the brain, he said.

SPECIAL OPS INTEREST

The Army's Special Operations community is becoming more interested in neurostimulation, Brunye said.

Recently, Special Operations Command and the Defense Innovation Unit Experimental, or DIUx, have been experimenting with neurostimulation. They have been especially interested in developing motor skills and new procedures with weapons systems, Brunye said.

In addition to coordinating with RDECOM, the Natick team works closely with the Army's Training and Doctrine Command on neurostimulation to enhance training, Brunye said. They also work closely with the Air Force Research Laboratory and have partnered with them on a NATO exploratory team examining several techniques for cognitive neuroenhancement.

Other government partners in research include the Intelligence Advanced Research Projects Activity, the Army Research Lab's Human Research and Engineering Directorate and the Defense Advanced Research Projects Agency. DARPA has been conducting related brain-stimulation research called Targeted Neuroplasticity Training, or TNT.

David Kamm, NSRDEC


# Remote Delivery

## MRE Pizza Coming Soon to Warfighter

**By K. Houston Waters, USAG Natick Public Affairs/Natick, Mass.**

From the most remote locations on Earth, Soldiers will soon be able to enjoy their favorite meal. Slices of delicious comfort, in the form of Meal, Ready-to-Eat (MRE) pepperoni pizza, are currently being cooked-up in preparation for worldwide distribution.

Soldiers have been asking for a pizza MRE since the 1980s. In 2012, advancements in food technology allowed scientists from the Combat Feeding Directorate (CFD) of the U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC) in Natick, Massachusetts, to begin to transform their vision of providing Soldiers a tasty and nutritious meal, with a three-year shelf-life, into a piping-hot reality.

Jeremy Whitsitt, deputy director, CFD, explains the science behind the process of creating a perfect shelf-stable pizza ration. "The real trick is to get bread, sauce, cheese, and pepperoni inside of a pouch, happily together for at least three years. With each of those individual components on their own, we can achieve the shelf life, but when you put them together – chemistry happens. All these components are interacting. You have four very distinct food matrices all interacting with each other, which can cause some unwanted results. That's why developing a shelf stable pizza has been so hard."

According to Whitsitt, the manufacturing aspect of producing a stable MRE pizza was also a challenge. CFD scientists and researchers were able to produce a viable prototype in a laboratory setting, but factoring in the impact of large-scale production and packaging was a significant hurdle to overcome.

"Were able to do a lot of things in the lab, but sometime when you scale up, working with a producer making these by the thousands, especially with a product that's never existed before and is not available in the commercial market, replicating the process and coming up with the same results is difficult. But we overcame challenges and we've got a good product now. And Soldiers will be seeing pizza pretty soon."

To ensure taste and quality, every item that goes into an MRE is extensively taste-tested by Soldiers in the field. The Army began field-testing the MRE-pizza in August 2014.

Whitsitt believes MRE pizza should be available to Soldiers in 2019, with some locations possible in 2018.

*David Kamm, NSRDEC*

The standard MRE contains a main course, side dish, a dessert or snack, crackers or bread with cheese, peanut butter or jelly, and a powered beverage mix – all fortified with essential vitamins, nutrients, and around 1,200 calories total. The MRE pizza MRE will contain cherry/blueberry cobbler, cheese spread with cheddar and jalapeno cheese, Italian bread sticks, cookies, and chocolate protein powder mix.

Developing a great tasting MRE-pizza that can be stored safely, at up to 100 degrees Fahrenheit for three years, was only part of the equation for the CFD food technologists.

"When you break it down, food is fuel. The fuel that powers the soldier. Everything that goes into the body has to be thought through very carefully. We're doing a lot of work into what naturally occurring ingredients are needed to increase, and sustain, high performance for an extended period of time. Working with our partners in USARIEM and the medical community, we're ensuring that what they're investigating – the physiological research – makes its way into ration components. That rations not only have the shelf life that they need but will be something that Soldiers want to eat. The idea is that these things will increase their performance so they can get back into the fight," said Whitsitt.

*A Soldier enjoys a Meal, Ready-to-Eat pizza developed by scientists in the Combat Feeding Directorate at the Natick Soldier Research, Development and Engineering Center. CFD used a combination of technologies involving water activity, pH levels, and innovative packaging to create a shelf-stable pizza. (Photo Credit: Michael Stepien)*


*David Kamm, NSRDEC*

# Cold Storage

## Army Researchers Advance Ice Making System

By Jeff Sisto, PM-FSS/Natick, Mass.

*Soldiers from the 3rd Expeditionary Support Command, part of the XVIII Airborne Corps' combat service support element, pass bags of ice from the Containerized Ice Making System, or CIMS, during a training exercise held at Fort Brag in April 2018. The CIMS was developed by the Product Manager -- Force Sustainment Systems, and can successfully generate and bag 3,600 pounds of potable ice per day and keep 1,200 pounds in cold storage for future use. The CIMS' capacity to produce on-demand ice meets the field feeding, medical, and mortuary affairs needs of Soldiers fighting down range. (Photo Credit: Jeff Sisto, NSRDEC)*

The Army is closer to getting ice to Soldiers on the battlefield after recent field evaluations proved the Containerized Ice Making System, or CIMS, can successfully generate and bag 3,600 pounds of potable ice per day and keep 1,200 pounds of that in cold storage for future use.

The CIMS' capacity to produce on-demand ice meets the field feeding, medical, and mortuary affairs needs of Soldiers fighting down range.

"Ice is a valuable commodity on the battlefield," said Will Feather, a mechanical engineer with Product Manager -- Force Sustainment Systems' Food Service Equipment Team, or PM-FSS FSET, and CIMS lead project officer.


*The Containerized Ice Making System, or CIMS, was developed by the Product Manager -- Force Sustainment Systems, and can successfully generate and bag 3,600 pounds of potable ice per day and keep 1,200 pounds in cold storage for future use. The CIMS' capacity to produce on-demand ice meets the field feeding, medical, and mortuary affairs needs of Soldiers fighting down range. Two third generation prototype CIMS units were brought in to support the XVIII Airborne Corps' 3rd Expeditionary Support Command during a training exercise held at Fort Brag in April 2018. (Photo Credit: Jeff Sisto, NSRDEC).*

"There is a cost and security benefit to the government if we can create an organic ice making capability that will enhance the Soldier's day-to-day life by providing all the other support that ice creates, including cold drinks, medical applications, mortuary affairs uses, and increased morale."

The CIMS is a TriCon-sized ISO container that produces ice on demand when provided the required power and water from a potable source. The ice is then bagged in 10 pound bags, heat-sealed, then moved to an internal holding location that can support 1200 pounds of stacked ice bags.

It can be opened on three sides and features a floor and walls that are fully insulated to minimize the heat transfer through the unit. The storage location features an integrated platform capable of monitoring the location of ice bags in order to intelligently and efficiently pack and store them.

The CIMS features three operating modes: Ice Production, Cooling, and Sanitation -- which are selected from a digital menu displayed on a control panel mounted to an exterior wall of the TriCon.

The respective modes give users the choice to either produce approximately 150 pounds of ice per hour, simply store previously produced ice, or purge all the water from the system to prepare it for cleaning, maintenance, or cold storage.

> **"Incorporating the CIMS into a unit's combat support services would drastically reduce the need for resupply missions and the inherent risk to Soldiers transporting ice via vehicle convoys in support of ground combat operations."**
>
> **Will Feather, PM-FSS**

The system can also monitor ice production rates as well as ice storage temperature data.

Originally developed by PM-FSS' FSET to meet the requirements of the Force Provider Expeditionary (FPE) Capability Production Document (CPD), the CIMS provides an organic ice-making capability that will save the Army significant costs by producing ice for units directly on site rather than shipping it into theater, resulting in reduced logistical support requirements while saving on waste, fuel, and resources.

Since 2016, the FSET has been working to test and enhance its functional capabilities with CIMS developer, Rocky Research, through a congressionally funded contract.

"Incorporating the CIMS into a unit's combat support services would drastically reduce the need for resupply missions and the inherent risk to Soldiers transporting ice via vehicle convoys in support of ground combat operations," said Feather.

At a spring warfighter training exercise held at Ft. Bragg with the XVIII Airborne Corps, two CIMS units were brought into the base-camp for Soldiers to have ice on demand, allowing their functionality and performance to be tested and analyzed in field conditions.

"XVIII Airborne Corps' combat service support element, the 3rd Expeditionary Support Command, approached us to ask for the CIMS to support their WFX training mission and we were able to make it happen," said Feather.

The WFX provided an opportunity for the

FSET and partner organizations to view it in operation and observe its technical performance. This allowed the engineers to identify areas that required adjustments and optimization. Some identified areas included improving airflow in the storage compartment, and optimizing the heat sealing of the bagging system.

The exercise also raised important questions for combat support decision makers, such as, 'who would be responsible for it, and how would it get to the battlefield?'

Fortunately, the CIMS is easily transported by military or commercial equipment, including flatbed truck, railway car, ship, forklift, or any other equipment capable of transporting an ISO container. It has been designed for downloading and uploading with the Force Provider ATLAS forklift, and can be easily deployed and operated where power and water sources are available.

The CIMS' refrigeration unit is easily maintainable and utilizes low-loss, quick-disconnect refrigeration tubing for the ability to repair without brazing. Additionally, it is designed to be operated by non-Military Occupational Specialty (MOS) specific, or 92G, users.

"Through the combined efforts of our partners from Combat Support/Combat Service Support (CS-CSS), the Combined Arms Support Command (CASCOM), the Army Test and Evaluation Command (ATEC), the Natick Soldier Research Development and Engineering Center (NSRDEC), the Public Health Command, and Rocky Research, we've been able to successfully develop, test, and refine the capabilities of the CIMS," said Feather.

The next step is to continue MIL-STD 810G representative testing of the third generation prototype, while developing an initial logistics package to include writing the technical and user maintenance manuals.

The continued testing will result in a Production Decision by ATEC in 2019, according to Feather.

"It's our job to get ice to Soldiers in the most efficient way, and the CIMS design and capabilities are meeting the requirements to do that."

At the publication of this article, Mr. William Feather has shifted to support the Ultra-Lightweight Camouflage Net System (ULCANS) program. Mr. Jorge Lopez-Jiminian is the current project lead for the CIMS.

*Jeff Sisto, NSRDEC*

# Antiterrorism Awareness

Army Strong℠

- Learn the indicators of terrorist activity
- If you see something suspicious, report it to the Military Police or local law enforcement

*See Something — Say Something*


Help protect our Army community