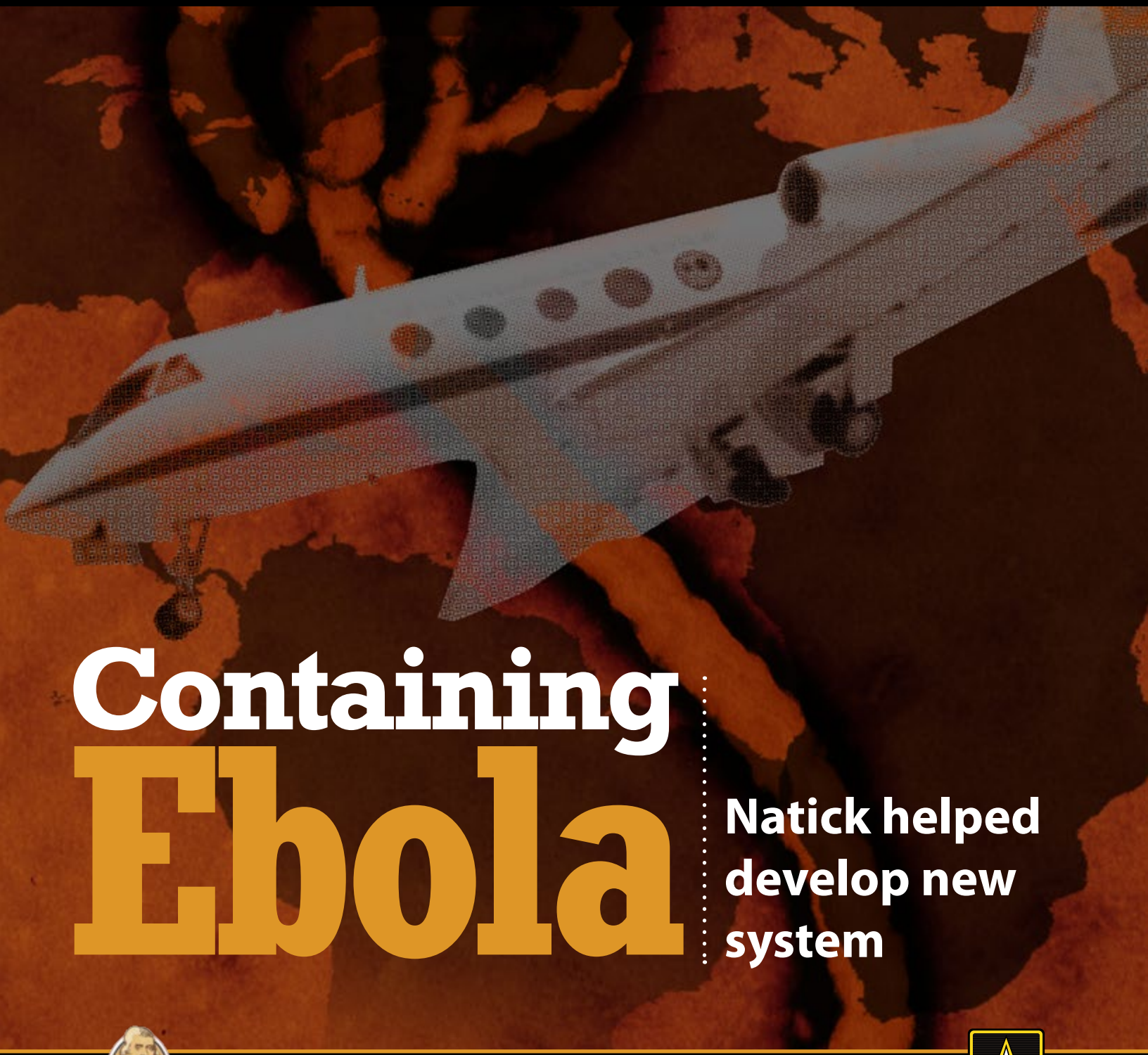
January 12, 2015

NSSC This Month

U.S. Army Garrison Natick Public Affairs Office



Containing Ebola

Natick helped develop new system

2013 Department of Defense Thomas Jefferson &
U.S. Army MG Keith L. Ware Award-winning Digital Publication

Publisher's Note

John Harlow
USAG-Natick and NSSC Chief of Public Affairs

Change is good

2015 is a year of change.

NSSC This Week becomes *NSSC This Month*. Changing from a biweekly publication to a monthly publication gives all of the people who put our newsletter together more time to make it look good and to make the quality of writing even better. We hope that you will notice and be happy with the changes in our publication.

We welcomed Command Sgt. Maj. Erika Gholar as the new garrison command sergeant major. She comes to Natick from Fort Gordon, and you will read more about the change of responsibility ceremony inside this issue. We also said goodbye to Command Sgt. Maj. Robert Beausoleil. He is off to his next assignment at Fort Riley, Kansas. He was a great supporter of our mission, and we wish him well.

Later this year, we will have a new Natick Soldier Research, Development and Engineering Center director, new garrison commander and probably a new senior commander. You will learn about them and their plans here at the Natick Soldier Systems Center by reading our newsletter.

There is one thing I can tell you that won't change in 2015. You, the reader, will get the best possible publication from our dedicated staff. We take pride in that and challenge ourselves to make each issue better than the last.

Enjoy your day, and thanks for reading *NSSC This Month*.

John Harlow
USAG-Natick and NSSC Chief of Public Affairs

NSSC This Month

NSSC
Senior Commander
Brig. Gen. William E. Cole

Garrison Commander
Lt. Col. Brian Greata

Command Sergeant Major
Command Sgt. Maj. Erika M. Gholar

Public Affairs Officer
John Harlow

NSSC Social Media Sites
Facebook: http://bit.ly/5tmSRd
Flickr: http://bit.ly/7BntsV
Twitter: http://twitter.com/natickssc

About this newsletter
NSSC This Month is a biweekly newsletter covering NSSC news within the Army and commercial media.

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

Art Direction by Philip Fujawa, NSRDEC Strategic Communications.

To subscribe to *NSSC This Month*, please contact Bob Reinert at robert.j.reinert.civ@mail.mil.

On the Web: www.army.mil/natick

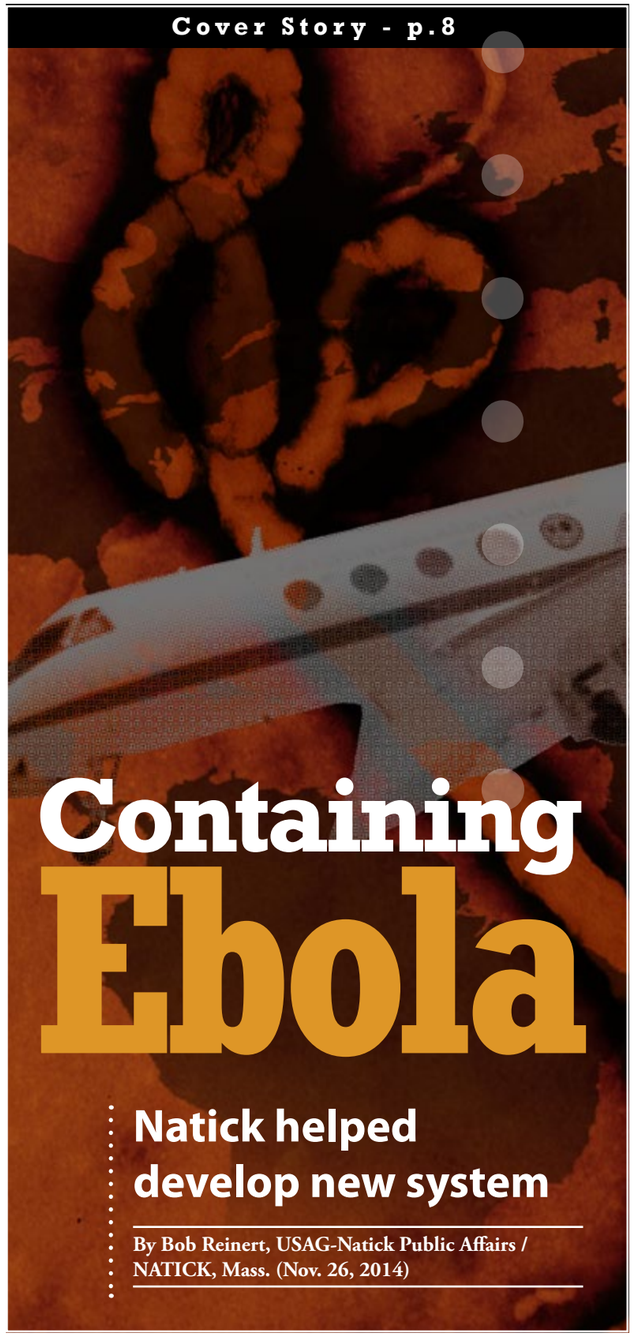
Photos by Dave Kamm, NSRDEC Strategic Communications, unless otherwise noted.

Cover illustration: Philip Fujawa, NSRDEC Strategic Communications

Table of Contents

January 12, 2015

NSSC This Month



NSSC This Month Feature Stories

'Lucky' Day p.10
Celtics mascot visits NSSC
By Bob Reinert, USAG-Natick Public Affairs

Ocean Fresh .....p. 12
Combat Feeding helps Navy keep produce from spoiling
By Jane Benson, NSRDEC Public Affairs

Soldier Power .....p. 14
Energizing our fighting forces
By Jeff Sisto, NSRDEC Public Affairs

Looking before they LEAP p. 16
Assessing Soldier load at Natick
By Jane Benson, NSRDEC Public Affairs

Also inside:

Bright Ideas.....4

Natick asks Soldiers about hygiene issues ..5

Integrating Soldier sensors.....6

Clothing drive becoming a staple at NSSC...7

Army Community Service needs 7
assessment survey

Reducing Waste 18

Accepting Responsibility 20

Feeding Frenzy 21

Natick nominee wins 22
STEM teacher of the year

Going green 23

Parting Shot: Holding Court 24

Photo: Jeff Sisto, NSRDEC Public Affairs

Bright Ideas

Natick pitches innovation in forum

By Jane Benson, NSRDEC Public Affairs / NATICK, Mass. (Dec. 31, 2014)

The U.S. Army Natick Soldier Research Development and Engineering Center, or NSRDEC, has come up with a new way to spark out-of-the-box thinking, risk-taking, and employee participation. The center implemented the "Bootstrap Initiative and Pitch Day."

The Bootstrap Initiative encourages innovation and creativity while streamlining processes and minimizing bureaucracy. The program accepts ideas from government civilian NSRDEC employees, who are allowed to submit proposals for a new technology, research project, business process, or administrative process that supports NSRDEC's mission, which includes researching and developing cutting-edge food, shelter, clothing and airdrop technologies and products.

Employee enthusiasm, participation and empowerment are at the heart of the initiative. Employees propose ideas and vote on which ideas receive funding.

NSRDEC's Dr. Ken Desabrais, a research aerospace engineer, conceived the idea and led the Bootstrap Implementation Team.

"The Bootstrap Initiative was conceived of as a way to bring the crowdsourcing concept to NSRDEC, to find innovative and creative ways within our organization to solve a spectrum of problems, from technical challenges to improvements in our business and administrative processes and tools," Desabrais said. "Our intent with the initiative was to encourage the sharing of ideas and help nurture a culture of collaboration amongst our colleagues to identify and find solutions to the problems we see in achieving our mission of helping the Soldier, while also empowering people to pursue and make decisions about those ideas.

"The Bootstrap Implementation Team did an exceptional job in pulling the initiative together in a very short time frame. We were able to implement and execute the initiative in about three months from start to finish, which is a testament to the dedication and commitment everyone put into the effort, including all the people [who] participated in submitting ideas and voting for proposals."

Although Bootstrap is intended to encourage originality and ingenuity, there are still some submission restrictions. For instance, ideas must be able to be carried out for $50,000 or less. Funding cannot be used to fund a contractor or external contract.

NSRDEC's Pitch Day provided a unique forum for both proposal creators and voters. During Pitch Day, proposers garnered employee voter support for their ideas by making posters, displaying prototypes, creating interactive displays and conducting show-and-tell sessions.

"This was a great effort to bring people together in a new and exciting way," said Donna Bulger, associate director for NSRDEC Operations and Outreach. "Giving the workforce an opportunity to have a voice in what efforts move forward generated some great discussion, and I am sure [it] will spark some new ideas for the next cycle."

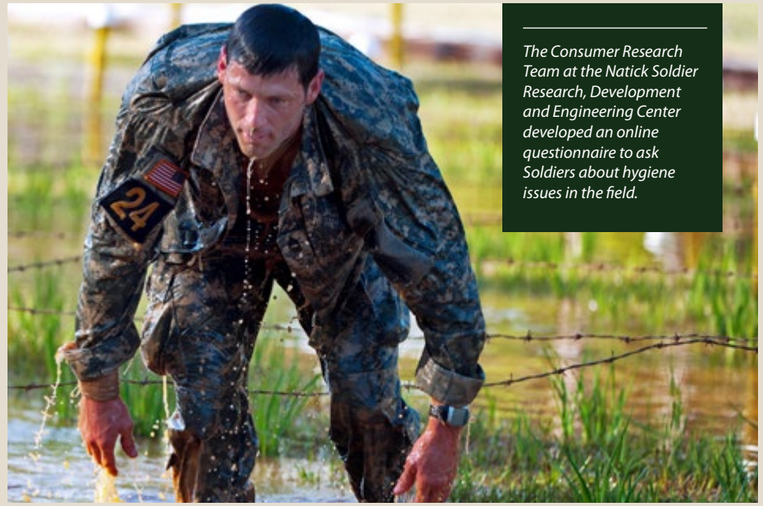
Pitch Day showcased many project home runs, but not every project could be a winner. Funding was limited and the competition was steep, with 37 groundbreaking ideas being submitted.

In the end, there were 18 winning proposals, ranging from zero-waste cafeterias to a low-altitude, high-accuracy airdrop activation device.

"The workforce's response to the Bootstrap program far exceeded my expectation," said Dr. Charlene Mello, NSRDEC chief scientist. "It has brought together the business, administrative and technical communities to collaboratively execute our mission. I am eager to follow the progress of funded ideas and generation of new ideas for future Bootstrap submissions."

Megan Hoey, an NSRDEC research chemical engineer, submitted a Bootstrap project entitled "Friend or Foe in Fibers," which was one of the projects chosen by NSRDEC employee voters for funding.

"The Bootstrap Initiative has provided an avenue for me to start some work on developing fibers with specific optical additives in order to inform and prepare for a larger-scale 6.2 friend vs. foe identification effort that is on hold. If funding becomes available for that effort, Bootstrap will have enabled me to hit the ground running and effectively and efficiently transition into the full-scale Warfighter Improved Combat Identification Development 6.2 project."



The Consumer Research Team at the Natick Soldier Research, Development and Engineering Center developed an online questionnaire to ask Soldiers about hygiene issues in the field.

Photo: Patrick A. Albright, U.S. Army

Natick asks Soldiers about hygiene issues

By Bob Reinert, USAG-Natick Public Affairs / NATICK, Mass. (Nov. 25, 2014)

In its effort to combat body odor and skin irritation affecting Soldiers in the field, the Army has developed antimicrobial treatments for such items as T-shirts, socks and sleeping bag liners, but little is known about the extent of such personal hygiene issues or their effects on warfighters.

"That information doesn't really exist right now," said Wendy Johnson of the Consumer Research Team, or CRT, at the Natick Soldier Research, Development and Engineering Center. "Right now, we're trying to get to the baseline of what the problem is."

The CRT will gather data straight from the sources. Team members have developed an online questionnaire for Soldiers throughout the Army who have deployed or taken part in field exercises, and they hope that thousands will respond.

The questionnaire, in development since last fall, can be found at https://surveys2.natick.army.mil/Surveys/antimic.nsf (CAC required), or at https://surveys.natick.army.mil/Surveys/antimic.nsf.

According to Johnson, the CRT will collect data for at least two weeks.

"Currently, the military doesn't have any requirements for (antimicrobial treatments)," Johnson said. "And so the question is, should the military have requirements? What should they be? How do we know that this stuff is good enough, is doing what it's supposed to do?"

To identify problems in the field, the CRT will ask questions about such afflictions as foot or body odor, athlete's foot, jock itch and skin rash. Soldiers will also be queried about what antimicrobial products — those that kill organisms and inhibit their growth — and how they use them.

"What do they expect from them?" said Johnson of the products. "Do they expect to be cleaner? Do they expect to be more healthy? Do they expect that it will control foot and body odor. When they use them, do they use them in the field? Do they use them while they're camping or hunting?"

It might be down and dirty work for the CRT, but it's necessary to find out how these hygiene issues affect Soldiers' performance and their ability to sleep in the field.

"We think that some of these things are going to get very low incidence rates, so we want thousands of Soldiers to answer this questionnaire for us," Johnson said. "We would want everyone, pretty much, who has been in the Army, who has been deployed or has at least been in field training under situations where this has been a concern."

Natick researchers integrate Soldier sensors

By Jeff Sisto, NSRDEC Public Affairs / NATICK, Mass. (Jan. 6, 2015)

To the modern, dismounted warfighter, the saying "knowledge is power" is true, especially when making quick decisions based on limited information.

Scientists and engineers from the U.S. Army Natick Soldier Research, Development and Engineering Center, or NSRDEC, are working hard to make information assets a fundamental component of the Soldier's kit.

"The ability to collect, process and share battlefield information can greatly improve the chances of mission success and troop survival," said Dr. David Darkow, the Mission Information team leader with NSRDEC's Warfighter Directorate.

Army researchers are developing a fully-integrated, mobile platform that provide dismounted Soldiers at the squad level with organic and shared sensor information to enhance situational awareness on the battlefield.

During a November 2014 experiment at Fort Benning, Georgia, Natick researchers teamed Soldiers with unmanned vehicles and brought Full Motion Video, or FMV, sensing sources to the Nett Warrior system — a smartphone-based device that supports advanced navigation, friendly-force tracking, command and control communications, and other sensor-fed information portrayals to Soldiers on the ground.

The Natick team developed the components that integrated with Nett Warrior's software architecture. The system is scheduled to transition to the Army's Project Manager Soldier Warrior where it will be one step closer to fielding.

The Nett Warrior Future Initiatives Team was key to ensuring the experiment resulted in the successful integration and transition of the FMV information portrayal concept into the Nett Warrior system, Darkow said.

"NSRDEC's role is to improve the Soldier experience," he said. "We provided support that helped transition the concept and we continue to support the NWFI team with its development by focusing on the Soldier's perspective of the system."

The team's goal was to achieve full integration of various intelligence surveillance reconnaissance sensor feeds into the Nett Warrior platform to maximize the tactical information available, while supporting the broader objective of getting this capability into the hands of Soldiers at the squad level, he explained.

The NSRDEC Mission Information Team also linked video feeds from squad-organic sensors such as the Dragon Runner 20 Unmanned Ground Vehicle and the Cargo Pocket-Intelligence, Surveillance and Reconnaissance, as well as an overwatch capability from Raven unmanned aerial vehicles.

To do this, Darkow's team developed and incorporated into the Nett Warrior platform a mobile, plug-in software application, called the Tactical Video Viewer, which auto-populates what sensor feeds are available and links users to the source's live video feed.

In this way, Nett Warrior "acted as a full-motion video server that rebroadcast those video streams on demand to other Soldiers in the squad," Darkow said.

"Soldiers see a moving map application that displays blue (friendly)-force tracking, C2 (command and control) information, and full-motion ISR video feeds," Darkow said. "Instead of just following dots on a map, Soldiers at the small unit and company levels can be viewing the same emerging battle space picture."

More work is still needed to expand integration and control of battlefield sensors that will enhance the tactical information portrayal for viewing by dismounted Soldiers in austere environments, Darkow said.

"The team provided the first opportunity to put this emerging NSRDEC technology into a Soldier's hands at the squad level within an operationally relevant context," he said. "It awent really well."

The Tactical Video Viewer is scheduled to transition to Nett Warrior and Project Manager Soldier Warrior, where the system will be optimized for Soldier performance.

Clothing drive becoming a staple at NSSC

By Tazanyia Mouton, USAG-Natick Public Affairs / NATICK, Mass. (Dec. 17, 2014)

Veteran homelessness has declined by 33 percent since 2009, but there is still a long way to go.

For the second consecutive holiday season, Sarah Ross, a Human Research Volunteer program coordinator with the Natick Soldier Systems Center, held a clothing drive for homeless veterans.

"I think it's great because people are finding me at work, during the year, and saying, 'Oh, when's that next clothing drive?'" said Ross. "It's already on their minds."

Ross stated that her objective is for the clothing drive to become a staple for the workforce here.

"My goal is for veterans in need to get what they need," Ross said.

Last fall's clothing drive, which came the week after Thanksgiving, was held for only five business days with four bins placed around the installation. That drive garnered 800 pounds of clothing, and the spring 2014 drive brought in nearly 2,000 pounds of clothing and items.

"I am humbled by how much people have been receptive to this clothing drive. When I put these bins out originally, I didn't know if I was going to get anything," Ross recalled of the first clothing drive. "I didn't know how it was going to go."

During the current drive, Ross collected more than 1,800 pounds of clothes and hygiene products. On Dec. 17, Ross and a few volunteers delivered the items to Veterans Inc. in Worcester.

"Everyone has a busy schedule, everyone has their families, everyone still has stuff to do," Ross said, "but they still found the time and cared enough to clean out their closets and went and purchased stuff."

"Veterans Inc. is deeply appreciative of all of the efforts of Natick Soldier Systems Center and its staff," said Jason Palitsch, a government and public affairs specialist with the organization. "We were truly stunned and amazed by the sheer volume of clothing we received as a direct result of their generosity. Hundreds of our brave men and women who have served our country, and are in need today, will benefit from the hard work and compassion of NSSC."

Ross, who was an Army medic, said that although people may take off the uniform after serving, they are still a part of our military community.

"Putting a sweatshirt or a pair of jeans or a coat on a homeless veteran on the street who has nowhere to go isn't going to fix the problem," Ross said, "but it's somewhere to start.

"I will continue to do this as long as I'm allowed to here and until the bins are empty, and even then, I don't know if that will stop me."

Ross said she is extra proud to be among people who want to help. She expects the next clothing drive to take place in May 2015.

> "Everyone has a busy schedule, everyone has their families, everyone still has stuff to do. But they still found the time and cared enough to clean out their closets and went and purchased stuff."
>
> Sarah Ross, NSRDEC

Army Community Service needs assessment survey

By Natick Army Community Service / NATICK, Mass. (Jan. 8, 2015)

The Natick Army Community Service, in partnership with Installation Management Command G9 Marketing Research and Analysis, is launching the Army Community Service Needs Assessment Survey today, Jan. 8, through March 6 at Natick Soldier Systems Center.

The Standardized ACS Needs Assessment Survey is being conducted as part of the local ACS accreditation process. The survey is intended to provide valuable information about ACS services, as well as other Family and Morale, Welfare and Recreation programs. The survey has been in paper format in the past, however, this year the survey will only be administered online.

This survey is conducted every three years and provides a unique opportunity to measure usage and helpfulness of individual ACS programs and services, and identify emerging needs related to the Army way of life.

The survey will allow people to express what programs and services they would like to see ACS provide, if their expectations of ACS offerings are being met, and what services have been the most beneficial to them. Let your voice be heard as our Army Community Service strives to best meet the needs of all military, veterans, family members, Department of the Army civilians, and contractors of Team Natick. To take part in the survey, simply visit http://www.armymwr.com/ACS-survey/ now through March 6. For more information, please contact Diane Magrane, ACS Information and Referral program manager, at 508-233-5377.

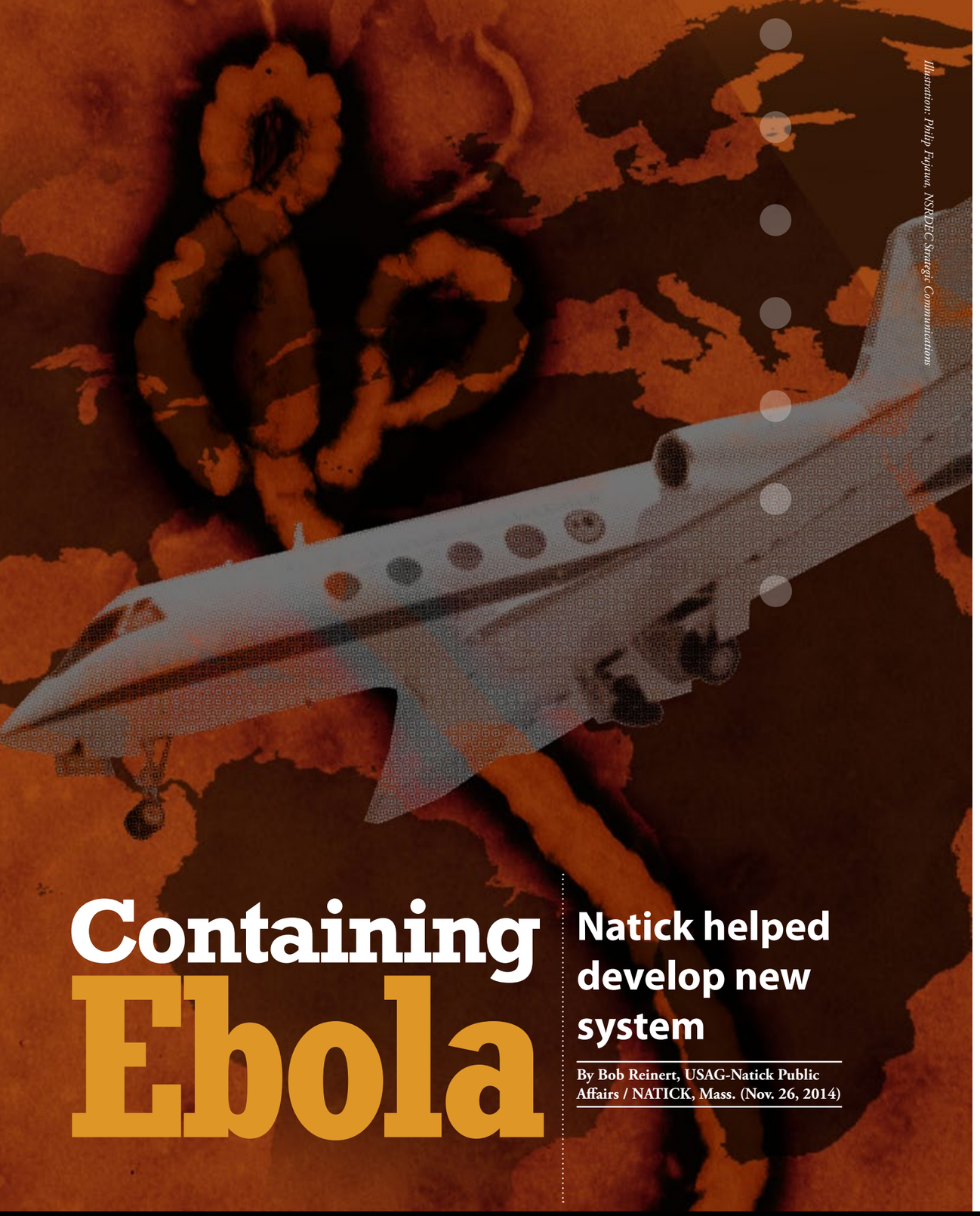


Illustration: Philip Fujitsu, NSRDEC Strategic Communications

Containing Ebola

Natick helped develop new system

By Bob Reinert, USAG-Natick Public Affairs / NATICK, Mass. (Nov. 26, 2014)

A containment system used to quarantine Ebola virus patients being transported out of West Africa was developed with help from the Natick Soldier Research, Development and Engineering Center.

The Aeromedical Biological Containment System, or ABCS, manufactured by Production Products of St. Louis, can be hoisted into a specially modified Gulfstream III air ambulance and flown by Phoenix Air Group back to the U.S., or other countries, where patients can receive more intensive treatment. Several successful missions have already been conducted.

"We've designed a lot of chem-bio defense systems for Soldiers, like those for the Deployable Medical Systems, but it's all been ground based," said Tom Larkham, an equipment specialist on the Fabric Structures Team of the Expeditionary Basing and Collective Protection Directorate at NSRDEC. "There (were) a lot of things (with the ABCS) that had to be tested for that we had never really had any experience with."

NSRDEC began working on the concept in 2007, with the Centers for Disease Control and Prevention, the Joint Project Manager for Collective Protection, and the U.S. Army Edgewood Chemical Biological Center.

As Larkham explained it, CDC was concerned about being able to transport its personnel home if they became sick while deployed overseas battling infectious diseases. Ebola had yet to become the focus.

"At the time, what they were worried about was (severe acute respiratory syndrome)," Larkham recalled. "And the other one was the avian flu, or bird flu. So they were really concerned about those more infectious airborne diseases taking off."

The ABCS went operational in 2012, but had never been used prior to the Ebola outbreak, Larkham said. The tent-like, modular system keeps the patient under negative pressure, isolating and filtering the air inside, and protecting the aircrew and medical personnel aboard.

"The materials themselves are impermeable but not really chem-bio resistant," Larkham said. "They're just inexpensive, general purpose tentage-type fabrics. What they do is they strip that fabric off and they incinerate it per (Environmental Protection Agency) standards when they come back."

The air inside the 190-cubic-foot patient compartment passes through a high-efficiency particulate air, or HEPA, filter.

"There's a front airlock so that medical attendants can go in and out during the flight," Larkham said. "That's at one negative pressure, which is slightly higher than the negative pressure that the patient's actually at. That way, they can move from the positive pressure inside the aircraft into where the affected patient is, and then come back out again."

As Larkham pointed out, it was the first time that Natick had worked on something that needed to maintain negative pressure in an aircraft as cabin pressures change.

"There's also a small, lightweight low-pressure, high-pressure alarm system that's in there that we developed here at Natick, and Janet O'Callahan was the project engineer for that particular item," Larkham said. "It gives a visual and an audio tone when the pressure varies from where it's supposed to be."

According to Larkham, one of the biggest design problems involved the zippers.

"The zippers are all hermetically sealed, waterproof/vapor tight zippers," Larkham said. "You can get these style zippers, but to get them to go around corners, to get them to operate easily for people that are dressed in protective garments where they can barely see where they're going is always difficult."

Photo: CDC

The Aeromedical Biological Containment System, which has been used to transport Ebola patients to the U.S. from West Africa, sits next to the Gulfstream III aircraft that carries it.

> "I felt great about it, being involved with the program, and having that system there, and having those people be able to be brought back and saved."
>
> Tom Larkham, Expeditionary Basing and Collective Protection Directorate at NSRDEC

Larkham found the work that he did on the project to be personally rewarding.

"I felt great about it, being involved with the program, and having that system there," said Larkham, "and having those people be able to be brought back and saved."

Photo: Michael Stephen, NSRDEC

'Lucky' Day

Celtics mascot visits NSSC

By Bob Reinert, USAG-Natick Public Affairs / NATICK, Mass. (Dec. 11, 2014)

Given the time of year and his attire, the Soldiers and civilians at the Natick Soldier Systems Center could be forgiven if they rubbed their eyes Dec. 11 after momentarily thinking that they had just seen an elf at the base.

Actually, the diminutive visitor sporting the shamrock-accented costume turned out to be "Lucky the Leprechaun," the team mascot of the hometown Boston Celtics, who was touring Natick as part of a Department of Defense/National Basketball Association initiative known as "Commitment to Service."

This collaboration between DOD and the NBA features Service members and athletes voluntarily working side-by-side to serve and improve communities throughout the U.S. The effort's four "pillars" include community, health, leadership and transition.

In introducing Commitment to Service earlier this year, Gen. Martin E. Dempsey, chairman of the Joint Chiefs of Staff, spoke of the initiative's great potential.

"Through 'Commitment to Service,'" said Dempsey, "we can help others understand the military, continue to find innovative ways to address the needs of communities in which we live and work, and foster a spirit of service across the country."

Lucky arrived at Natick wearing a modified version of his leprechaun costume, which featured camouflage, the American flag and white Shamrocks. He blended in nicely as he chatted with Soldiers.

He routinely performs trampoline-powered, acrobatic dunks during Celtics games, so Lucky kept his energy level high at Natick. After sampling combat rations and meeting with Soldiers, he braved 40-mph winds in Natick Soldier Research, Development and Engineering Center's Doriot Climatic Chambers, walked a treadmill in "full battle rattle," donned a free-fall parachute, and tested his shooting ability in the Engagement Skills Trainer.

At the Department of Defense Combat Feeding Directorate, Lucky sampled the Asian beef strips after warming them in a flameless ration heater.

"I could get used to this," Lucky said of the food. "This is good. This is better than what I make in my kitchen."

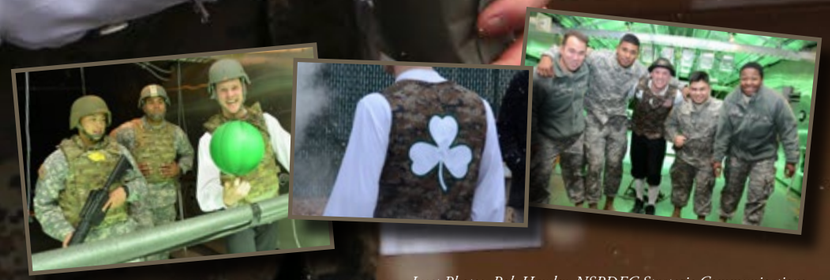
He burned off some of those calories on the treadmill, adding his own touch by spinning a green and white Celtics basketball on his right index finger as he negotiated a nine-percent grade.

From there, it was on to the Engagement Skills Trainer, where he simulated shooting an M4 carbine.

"It's got more kick than I thought it would," Lucky said. "Am I anywhere near the target?"

Throughout the visit, Lucky asked thoughtful questions and obviously enjoyed learning about what Natick does.

"I'm fascinated by everything that goes on here," Lucky said. "So, basically, it's for improving Soldier performance. I guess that makes sense. Soldiers are athletes."



Inset Photos: Rob Hawley, NSRDEC Strategic Communications

Photo: U.S. Navy

> You put together people like myself — who have been in the environment and who have the knowledge and experience — and you team us with a dedicated engineer like Peter Lavigne, you get a high-quality product and you get a high-quality transition."
>
> Lou Jamieson, Combat Feeding Directorate

Ocean Fresh

Combat Feeding helps Navy keep produce from spoiling

By Jane Benson, NSRDEC Public Affairs / NATICK, Mass. (Dec. 16, 2014)

Researchers at the Natick Soldier Research, Development and Engineering Center, or NSRDEC, are working to make sure fresh produce isn't lost at sea.

Fresh fruits and vegetables are diet essentials, but keeping produce fresh can be particularly challenging aboard Navy aircraft carriers. Refrigeration helps prolong the shelf life of produce, but a technology was needed to help combat the effects of ethylene gas. Ethylene is a naturally occurring plant hormone that helps plants ripen but also leads to spoilage. Certain types of produce, such as bananas and apples, produce large amounts of ethylene and can accelerate the spoilage of nearby produce, as well. Even low levels of ethylene can destroy a produce shipment in less than a day, but reducing the presence of ethylene can extend shelf life by days and even weeks.

To help extend the shelf life of refrigerated produce aboard Navy aircraft carriers, researchers in NSRDEC's Combat Feeding Directorate, or CFD, partnered with Primaira of Woburn, Massachusetts, to scale up extended preservation technology originally developed under an Army Small Business Innovation Research, or SBIR, contract.

"The technology is based on ultraviolet, or UV, light," said Peter Lavigne, a chemical engineer on CFD's Equipment and Energy Technology Team, who has researched extended preservation technology since 2006. "It scrubs the air and eliminates the ethylene gas. Another strong benefit of UV light is its antimicrobial activity and associated ability to reduce mold growth and even inactivate spores that may be present in the air."

This Ethylene Control Device, or ECD, safely and rapidly oxidizes ethylene to carbon dioxide and water vapor. By continually removing ethylene, the device slows the spoiling process, keeping produce aboard ships fresher longer.

The ECD has been configured as a modular enhancement kit that is inserted into existing refrigerated containers aboard ships. With a small amount of electrical power, the ECD safely decomposes the volatile and microbial contaminants yet avoids the labor-intensive and material-handling challenges presented by traditional ethylene-control practices, which include blankets, filters and pellets that chemically bind or absorb ethylene and moisture. For a ship at sea for long periods, these practices have posed significant logistical burdens attributed to stocking, maintaining, and ultimately disposing of materials that are in some cases regulated as hazardous waste.

The ECD was specifically developed to avoid these challenges and provide an effective, compact, low-power, low-cost, and easy-to-maintain solution.

"You're reducing costs of losses by not having to throw it away," said Lavigne. "With this technology we see a marked reduction of browning, wilting, and mold growth."

"They don't have to replenish as often," said Lou Jamieson, a retired Navy master chief petty officer and a CFD Navy project officer on the Systems and Engineering Team. "So if you think about this in the case of a ship with a critical mission, it could be in one ocean and then might have to head full speed to another ocean. You may have to forgo your scheduled replenishment. So this technology can help in those types of situations."

"When they are deployed 30-plus days, the extended shelf life is critical," said Lavigne.

"Another major benefit of this technology insertion is a reduced workload for the warfighter," said Jamieson. "An annual bulb change-out is the only maintenance. It is mounted and then it just runs and they can forget about it."

The device has been installed on two Navy aircraft carriers and will ultimately be installed on all eleven in the fleet. CFD has teamed with Primaira to help Sailors properly install and operate the ECDs and will continue to monitor the performance and overall results achieved.

"What we are doing right now is an at-sea evaluation," Jamieson said. "It's currently deployed on one carrier and recently installed on another. Eventually, it will be installed on all the carriers in the Navy. From on-board data collection and observation of produce quality, we intend to determine actual mixed-load (assorted produce) life extension. How much less did they have to order during deployment (due to less spoilage)? How many times did they have to replenish?"

In addition to use on ships, the technology can also be inserted into refrigerated containers for use by the Army, other services, and even commercial refrigerated assets, ensuring the highest-quality fresh produce can be delivered to Soldiers operating in remote forward areas.

Improving quality of life for all service members motivates both men.

"That's why I'm here" said Lavigne. "It's incredibly rewarding to see our work making a difference for our military."

"As a retired Navy master chief petty officer, I'm really enjoying having an impact on all the warfighters and improving their quality of life," said Jamieson. "Our job is to lighten the workload for warfighters and to give them the best quality equipment and technology that we can. We're huge on that. You put together people like myself — who have been in the environment and who have the knowledge and experience — and you team us with a dedicated engineer like Peter Lavigne, you get a high-quality product and you get a high-quality transition."

Soldier Power

Energizing our fighting forces

By Jeff Sisto, NSRDEC Public Affairs / NATICK, Mass. (Nov. 17, 2014)

Wearable technologies may provide U.S. Soldiers with on-the-move, portable energy and reduce the weight of gear they carry into combat.

Researchers at the Natick Soldier Research, Development and Engineering Center are developing Soldier-borne energy-harvesting technologies.

During the Maneuver Fires Integration Experiment, a combined, multi-phase joint training exercise held in September 2014, at Fort Benning, Georgia, researchers tested prototype energy-harvesting technology solutions.

"My initial impression is that they fulfill a need for instant power generation on long-range missions when displaced from traditional resupply methods," said Sgt. 1st Class Arthur H. Jones, an infantryman with the Maneuver Center of Excellence who participated in the demonstration.

A sharp rise in Soldier-worn power capabilities has resulted in a dramatic increase in the number, variety and weight of batteries carried by warfighters in the field.

This weight prompted NSRDEC researchers to begin developing and evaluating small, lightweight, efficient, on-the-move, portable energy-harvesting and distribution systems that eliminate the need to carry extra batteries.

Energy harvesting works by capturing small amounts of energy that would otherwise be lost as heat, light, sound, vibration or movement. It uses that energy to recharge batteries and provide power for electronic devices such as a Soldier's communication equipment, sensors, or battlefield situational displays.

Researchers first demonstrated the concept to Army and government representatives at Fort Devens in April 2014. The demonstration consisted of experienced Soldiers wearing three energy-harvesting devices while traversing a four-mile course that included hard surfaced roads, lightly wooded areas, open fields and hilly terrain.

The technologies, which included wearable solar panels, backpack and knee kinetic energy-harvesting devices, are now being tested at MFIX as ways to reduce the weight and number of batteries Soldiers must carry to power electronic devices.

Lightning Pack's Rucksack Harvester relies on the weight of the backpack to produce kinetic energy when the backpack oscillates vertically in response to the Soldier's walking or running stride. As the backpack is displaced vertically, a rack attached to the frame spins a pinion that, in turn, is attached to a miniature power generator. It is capable of producing 16 to 22 watts while walking, and 22 to 40 watts while running.

Bionic Power's Knee Harvester collects kinetic energy by recovering the power generated when walking. The articulating device is attached to both the upper and lower part of each leg and extracts energy when the knee is flexed. Through software control, the knee harvester analyzes the wearer's gait and harvests energy during the phase of the stride when negative work is being performed. This attests that the Soldier is exhibiting less metabolic activity descending when compared with descending without wearing the device.

MC-10's photovoltaic Solar Panel Harvester operates by converting sunlight into electrical energy. The panels, which cover a Soldier's backpack and helmet, are constructed from thin gallium arsenide crystals that provide flexibility to the panel's material and allow it to conform to a Soldier's gear. Under bright sunlight conditions, with the PV panel facing the sun, the backpack panel is capable of delivering 10 watts while the helmet cover panels provides seven watts of electrical power.

At MFIX, NSRDEC researchers collected power-management data and assessed user feedback from the Soldiers wearing the technologies. Once the energy-harvesting technologies themselves are validated, the next step will be to sync with the Integrated Soldier Power Data System as a way to distribute the energy to a Soldier's electronic devices.

Additionally, "MFIX is looking at new concepts with energy-harvesting devices and how they fit in a tactical environment," said Noel Soto, project engineer, Power and Data Management Team of the NSRDEC Warfighter Directorate.

"MFIX is an important opportunity that allows us to quantify the energy-harvesting technologies that generate Soldier power on the move," said Henry Girolamo, lead, Emerging Concepts and Technologies, Warfighter Directorate, who has been involved with the effort since 2011. "The MFIX Data collected in the experiment will inform us of the power harvester efficiency by comparing energy harvester equipped Soldiers and non-energy harvester equipped Soldiers and states of charge from the energy harvesters versus discharge from non-energy harvester equipped Soldiers."

A Soldier navigates an obstacle course, which is part of the Load Effects Assessment Program, or LEAP. The LEAP includes the most common and most challenging activities that warfighters perform in combat.

Looking before they LEAP

Assessing Soldier load at Natick

By Jane Benson, NSRDEC Public Affairs / NATICK, Mass. (Nov. 25, 2014)

Researchers from the Biomechanics, Human Factors and Anthropometry Teams at the Natick Soldier Research, Development and Engineering Center are conducting a reliability assessment of the Load Effects Assessment Program, or LEAP.

NSRDEC researchers want to determine if the tool, which was developed by the Marines, can be adapted to meet Army needs and provide a reliable method to measure the impact of clothing and individual equipment, or CIE, on Soldier performance.

By understanding how CIE affects the warfighter's ability to move and maneuver through the LEAP obstacle course, scientists and engineers will be able to implement modifications to optimize the design and integration of CIE — thus, improving Soldier-System interface and performance. The reliability assessment is just one in a series of assessments that will be conducted using the LEAP system.

"Natick has partnered with PEO Soldier Product Director Soldier Systems Integration; Maneuver Center of Excellence — Maneuver Battle Lab; and the Army Research Laboratories — Human Research and Engineering Directorate to share the knowledge learned about using the tool and to develop a standard methodology for product assessment using the tool," said Blake Mitchell, a human factors engineer and acting team leader for NSRDEC's Human Factors Team. "This information will also be fed to an international working group consisting of Australia, Canada, New Zealand, the United Kingdom, and the United States, who hope to be able to use the LEAP tool as a joint data-collection tool."

Based on Marine input, the LEAP tool consists of a series of obstacles and mission-relevant activities to resemble challenges that warfighters face in current combat situations. Soldiers participating in NSRDEC's LEAP assessment navigate stairs, ladders, tunnels, windows, walls and balance beams. They also perform a myriad of mission-related tasks, including load transfers, simulated casualty drags, low crawls, high crawls, back crawls and sprints.

"The activities that are part of the LEAP were developed to mimic the most common, as well as the most challenging, activities that warfighters perform in combat," said Mitchell. "This condenses many potential movements and activities of a mission into a single tool. The warfighter's performance, including subjective opinions, provides insight into his or her range of motion, comfort, mobility and endurance, as impacted by the CIE configuration worn."

As part of the reliability assessment, Mitchell and her team documented how many times Soldiers had to go through the course before data was consistent.

"Our research program has many facets to it, and this is just the first step," said Mitchell. "In order to implement the tool, we need to understand some of the scientific underpinnings of it. And in this case, (we) want to better understand if consistent data can be collected, and if so, how many times do individuals need to complete the course to perform consistently? As a first step, this is being accomplished with the Soldiers wearing minimal equipment, but as we move forward, it will be investigated with additional CIE and loads."

Tyler Brown, a research physiologist on NSRDEC's Biomechanics Team, is working on a second research project based on the LEAP tool. He is not using the LEAP tool as a whole for research, but is conducting a laboratory-based study mimicking movements taken directly from select LEAP tasks.

"The overarching purpose is to establish a scientific understanding for why differences in weight between various configurations of clothing and individual equipment impact Soldier performance," said Brown. "The clothing and individual equipment Soldiers wear can have different weight, stiffness and bulk characteristics. All of which may impact physical performance. With this study, we are trying to establish how Soldiers' performance, especially their trunk and lower limb biomechanical profile, is impact by small changes in the weight of CIE."

"Researchers may be able to compare whether a bulkier configuration of CIE has a significant reduction in physical performance compared to less bulky configuration," said Brown. "Researchers may also be able to compare performance on specific tasks embedded in the LEAP. For instance, they might be able to compare whether the bulky configuration had a significant impact on performance during the agility run, or why performance between the bulky and less bulky configurations of CIE was not different on a vertical jump."

The tool may prove to be a LEAP forward.

"LEAP is a tool that can be useful for future clothing and individual equipment studies to better understand the effects that CIE has on Soldier performance," said Mitchell.

Reducing Waste

Army conducts base camp technology demonstrations

By Jeff Sisto, NSRDEC Public Affairs / NATICK, Mass. (Dec. 19, 2014)

The Army took another step toward increasing self sustainment, while saving energy at its contingency bases overseas.

Army researchers recently completed Demonstration 1, the first in a series of demonstrations looking at energy-saving technologies, which will reduce the fuel, water demands and the waste generated for backhaul currently experienced at small base camps in forward operational environments.

The demonstrations support the Sustainability Logistics Basing, Science and Technology Objective-Demonstration, known as SLB-STO-D (formerly TECD 4a). The program was initiated by the Army in 2012, to reduce the cost and risk associated with mounting resupply burden at expeditionary bases, and serves as the guiding framework for the effort.

"The Army needs improved capability to enable independence/self-sufficiency and to reduce sustainment demands at contingency bases," asserts the SLB-STO-D problem statement collectively developed by the Army Science and Technology Advisory Working Group. "It is too costly, too unpredictable, and too labor intensive for a small unit to carry all required consumables to last for weeks or months at a combat outpost or patrol base. Storage facilities and systems do not meet the needs of these small bases, and resupply efforts are highly unpredictable."

The primary objective is to reduce fuel consumption by 25 percent, water demands by 75 percent and generated waste for backhaul by 50 percent at extra-small and small bases — all while maintaining standards for Soldiers' quality of life, or QoL.

Pursuing this objective required a lead organization that understands the relationship between base camp efficiency and QoL measures, provides data-based technology analysis, and has the ability to leverage collaboration with key science and technology partners across the operational spectrum.

The lead for this highly collaborative effort went to the Research, Development and Engineering Command, or RDECOM, and is being managed by the Natick Soldier Research, Development and Engineering Center, or NSRDEC.

"Integrated base camp technology solutions are an enduring problem that impacts Soldier readiness," said Gregg Gildea, the SLB-STO-D lead for NSRDEC. "We are addressing it through a model-based, systems engineering approach that uses data collection and analysis of both materiel and non-materiel solutions, along with operationally relevant physical demonstrations."

"The results of operationally relevant Demonstration 1 will provide input to modeling and simulation applications, which will validate the methods used to address this challenge," explained Gildea. "Army leadership and policy makers will make informed decisions based on the data collected and presented by SLB-STO-D and QoL information."

NSRDEC's Experimentation, Demonstration, and Validation Team, or EDVT, is leading the integrated field demonstrations that make up Demonstration 1, which seeks rigorous data collection and analysis of technologies identified as potential solutions to the Army's operational energy gaps.

"The purpose of the demonstration was to collect data on select candidate technologies in an operationally relevant environment," said Bill Harris, EDVT lead. "It's an opportunity to showcase the maturity of these technologies to our partners and analyze their effectiveness."

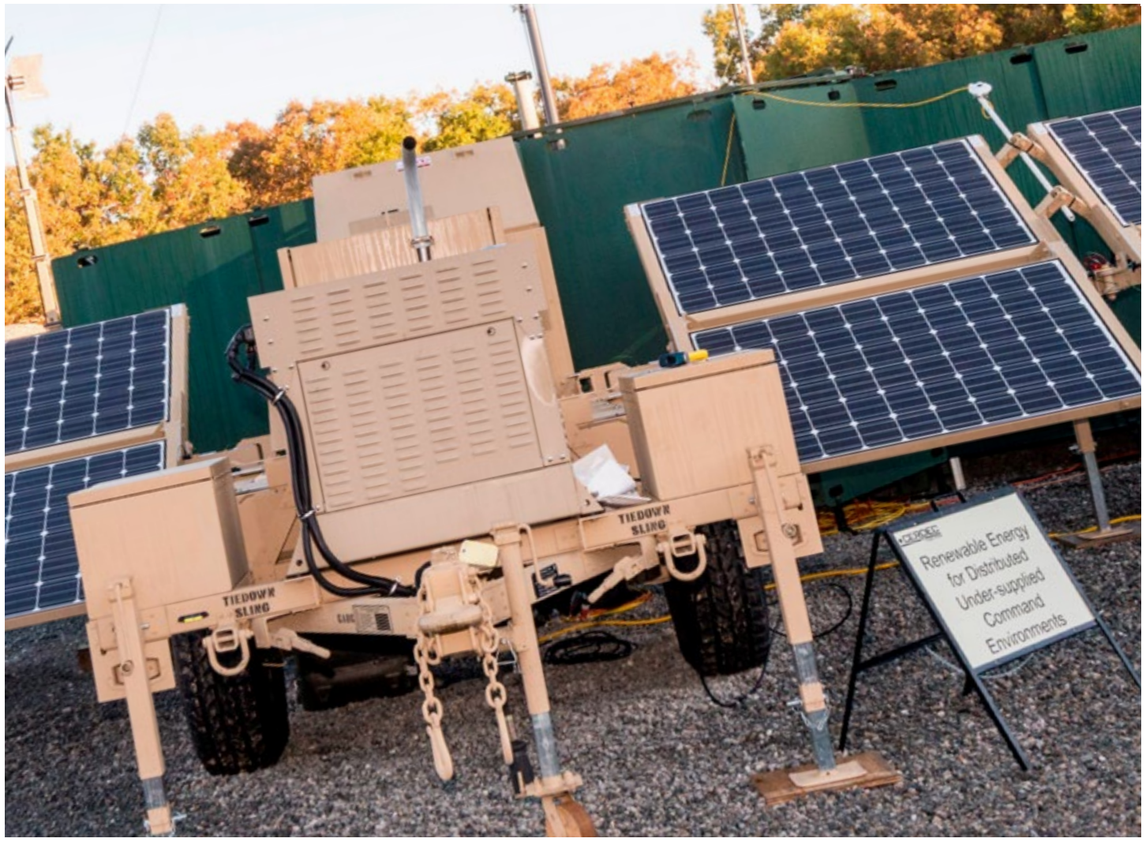
In order to replicate relevant field conditions, Demonstration 1 was conducted at the Base Camp Integration Lab, or BCIL, at Fort Devens, Massachusetts, which features two 150-man "Force Provider" base camps designed for testing and evaluating Army expeditionary basing programs. While one camp contains the current operational baseline that acts as a control, the other offers an experimental platform to insert and assess energy-saving technologies of the future.

The BCIL's size and versatility offered an ideal venue to conduct the first phase of Demonstration 1, which focused on extra-small base camps of 50 to 299 Soldiers. Starting with a 50-man base camp allowed SLB-STO-D researchers to establish a baseline of interest and collect data to calibrate technologies for subsequent demonstrations of larger base camps.

"Force Provider is a 300-man camp with structures, but we used it as a surrogate for a 50-man camp located in an austere environment, to demonstrate where technology can fill energy gaps," said Gildea.

Several of the candidate technologies at Demonstration 1 were developed by partners at the Communications-Electronics Research, Development and Engineering Center, or CERDEC, and the Tank Automotive Research, Development and Engineering Center, or TARDEC. These included solar shades and micro-grids designed to fill energy gaps supporting fuel, water and waste reduction.

The Renewable Energy for Distributed Under-Supplied Command Environments, or REDUCE, is a mobile, scalable, intelligent framework of solar panels that enables remote power generation through a 1.5kW power solution. REDUCE features upgraded energy storage devices and power management controls that reduce the power requirements from generators and provide users with power-status information. The system will reduce the cost and logistic burden of delivering fuel to small base camps.



The On-Board Vehicle Power/Tactical Vehicle-to-Grid Module, or OBVP/TV2GM, is a mobile, bi-directional power generation and management system that generates power from the vehicle's transmission and accepts multiple electrical power-generating input sources. OBVP allows Soldiers to utilize vehicles, solar power systems, tactical generators and host-nation grids to more efficiently distribute the energy needed to power heating, air conditioning and lighting requirements at small base camps. This means that less fuel and maintenance is needed for existing generators.

The JP-8 Fueled, Man-Portable Genset for Power Generation for Expeditionary Small Unit Operations is a lightweight, Soldier-portable, JP-8 fuel conversion kit that adapts gasoline engines for JP-8 fueling. Utilizing this fuel conversion technology will provide Soldiers with more self-sufficiency and reduce the logistical demands of fuel requirements.

Soldiers from the 542nd Quartermaster's Force Provider Company, were trained on these power management technologies and provided invaluable feedback through a focus group session.

While innovative technologies improve energy-saving capabilities, they do not fully address the QoL issues facing Soldiers at contingency bases, such as the availability of hot and fresh food, the ability to take showers and access the Internet.

For this perspective, NSRDEC utilized the expertise of its Consumer Research Team, or CRT, which develops and conducts surveys that measure Soldier insight about the QoL aspects of a new technology or concept.

"Base camp conditions drive the Soldier's quality of life," said Justine Federici, a researcher with the CRT. "QoL affects sleep, hygiene, morale and other factors impacting Soldier readiness."

"Surveys are designed around seven categories that impact Soldier-QoL, including billeting, security, hygiene, work area, medical care, morale and recreation opportunities," said Federici.

The survey data and feedback collected at Demonstration 1 will provide researchers with critical input to conduct a "tradeoff analysis" between saving energy and preserving certain QoL standards, Federici explained.

"A QoL model will be provided to the SLB-STO-D and the contingency basing community," said Federici.

The next phases of Demonstration 1 are scheduled for April 2015, and July 2015, when researchers collect data at 600-1000-man camps and 150-599-man camps, respectively.

The SLB demonstrations will serve decision makers with validated, scientific analysis that balances the energy saving capabilities and QoL standards necessary to make contingency bases more self-sufficient and Soldiers more resilient.

Accepting Responsibility

Natick welcomes new command sergeant major

By Bob Reinert/USAG-Natick Public Affairs / NATICK, Mass. (Jan. 7, 2015)

In a change of responsibility ceremony Jan. 6, Command Sgt. Maj. Erika M. Gholar took over as U.S. Army Garrison Natick command sergeant major.

Gholar received the garrison colors from Command Sgt. Maj. Robert J. Beausoleil, the outgoing garrison command sergeant major, during the ceremony in Hunter Auditorium. Beausoleil moves on to Fort Riley, Kansas, where he will become the 1st Infantry Division G6 sergeant major.

Gholar comes to Natick from Fort Gordon, Georgia, where she helped establish the Army Cyber Command.

"As you would expect, she brings a wealth of knowledge and experience that will serve her well as she begins her time and work here as the garrison command sergeant major," said Lt. Col. Brian R. Greata, Natick's garrison commander. "I'm confident that she's already begun to master the challenge of installation management."

Gholar called it a special day for her and her family.

"Today, I embark (upon) and embrace the responsibility entrusted to me as your command sergeant major," Gholar said. "I'm reminded today of one person that is not able to be with me, and that's my late father, Mr. James Gholar Jr., who was also a Soldier."

Her father had words of wisdom for Gholar as she began her Army career in 1988.

"Take care of Soldiers and the mission, and God will ensure the rest falls in line for you as a leader," Gholar recalled him saying. "I carry that with me my entire career."

Gholar pointed out that the Army's greatest asset is the Soldier.

"It is the focus for the last 60 years of the Natick Soldier Systems Center," said Gholar, "from the Soldiers to the civilians that work here, to make that dedication and commitment of supporting the Soldiers, families and the civilians of our great Army — the best — on a daily basis."

Greata bid farewell to Beausoleil, saying that he had served Natick selflessly.

"He's given of himself in so many aspects of the job and demonstrated his commitment to excellence and loyalty in so many ways that I'd well exceed my time to list them all," Greata said. "I think that the wide diversity of organizations represented in today's audience attest to the fact that he's been a great installation and community partner.

"It's safe to say that everyone in this room has been affected by Sergeant Major Beausoleil in one way or another."

Beausoleil said he would miss his time as Natick command sergeant major.

"This is the only position that you can truly have an immediate impact on Soldiers, families and (Army) civilians," Beausoleil said. "I have truly grown professionally and will take the skills I learned with me for a lifetime."

Feeding Frenzy

Natick hosts Food Science & Industry Day

By Jane Benson, NSRDEC Public Affairs / NATICK, Mass. (Nov. 7, 2014)

Science and the spirit of collaboration ruled the day on Oct. 30 at the first Food Science and Industry Day held by the Combat Feeding Directorate, Natick Soldier Research, Development and Engineering Center.

To provide the warfighter with the highest quality food that science can offer — including optimal nutrition, taste and freshness — NSRDEC CFD combines its impressive knowledge of food science and technology with that of industry and academia. CFD's core competencies include applied nutrition and biochemistry; food engineering preservation and stabilization; food protection, defense and microbiology; food service equipment engineering; food packaging and polymer science; and product development, technical evaluation and ration design.

"Our mission in hosting the first-ever Food Science & Industry Day was to use it as a means of communication with which to deliver project updates, strategic vision, future areas of effort, and overall program goals," said Jeremy Whitsitt, team leader, Office of the Director, CFD. "It also provided a unique forum wherein CFD project officers could engage in valuable dialogue directly with our visitors. Using various methods of communication such as poster presentations, hands-on demos, and laboratory tours, we tried to provide an interesting, thought-provoking, and overall fun experience for all involved."

Food Science and Industry Day provided the approximately 100 attendees with the chance to learn the particular challenges and constraints of developing combat rations and equipment for the nation's warfighters, who often operate in remote locations under austere conditions, as well as information on how to do business with the government.

"Our partners in operational ration research, development, test, evaluation, and production are extremely critical to the success of our total life-cycle joint program," said Whitsitt. "We know that we can't do this alone. Our unique mission requires that we leverage both financial and intellectual resources in order to be effective. Our partners — whether they are from academia, industry, or other government agencies — bring a lot to the table. Any collaborative endeavor requires effective and consistent communication."

John McNulty, executive director of Research & Development Associates for Military Food & Packaging Systems, Inc., attended the event. R&DA is a national trade association whose members include major food manufacturers and suppliers who provide food and rations to the U.S. government in the military marketplace. McNulty had high praise for the event.

"Sixty-three key industry players, who are intimately involved in the production and distribution of military rations and food, got to see first-hand, the extensive research — both tech base and production and engineering research — that goes into the development of military specification rations," said McNulty. "It was an eye-opening experience for everyone participating."

At the heart of the event was CFD's ongoing commitment to the Soldier.

"It's a great feeling that our work helps (improve) the rations and nutrition for our warfighters," said Ken Racicot, a CFD food technologist/nutritional biochemist. "I'm always thankful for the opportunity to be a part of this program."

"Nothing tops the fulfillment of seeing the Soldiers maintain their top condition, physically and mentally, by eating the rations we improved or developed," said Dr. Tom Yang, a senior CFD food technologist.

The Natick High School robotics team, led by 2014 Massachusetts STEM Teacher of the Year winner Doug Scott, collaborates with NSRDEC at a mentor session during the development of their underwater search and rescue ROV, which was later selected for presentation at the White House Science Fair.

Photo Credit: Natick High School

Great Scott!

Natick nominee wins STEM teacher of the year

By Jeffrey Sisto, NSRDEC Public Affairs / NATICK, Mass. (Oct. 21, 2014)

Researchers at the Natick Soldier Research, Development and Engineering Center, or NSRDEC, will be among those cheering the loudest when Natick High School's Doug Scott is recognized as the 2014 Massachusetts STEM Teacher of the Year on Oct. 22 during the Massachusetts STEM Summit at the DCU Center in Worcester.

The award, given by The Hall at Patriot Place and Raytheon, recognizes teachers in the Commonwealth of Massachusetts for achievements in science, technology, engineering, and math, or STEM. Natick High School will receive $5,000 to be used for STEM education.

NSRDEC, which is dedicated to advancing STEM education and outreach to local schools, nominated Scott for the prestigious award.

"I feel honored that Natick Labs nominated me for this award," said Scott. "By providing financial support, professional mentors, and even facilities for a summer camp, Natick Labs was a major reason that we were able to get a STEM program running at Natick High School.

"There were many other worthy candidates so I am little surprised I was selected."

But NSRDEC employees were not surprised. Scott has worked with NSRDEC to provide his students with hands-on STEM experiences, and researchers here have taken notice of his work, enthusiasm and impact across the STEM community.

"The NSRDEC wanted to nominate Doug Scott for all the collaboration we have done with him over the last three or four years, which has helped us grow our STEM outreach program," said Joanna Graham, STEM outreach coordinator for the NSRDEC, who led the effort to prepare the nomination package. "If you don't have educators who feel motivated and connected to the larger community, our STEM outreach would struggle. But Doug has been instrumental in this relationship. We wanted to be among the other voices who say 'What you're doing matters.'"

It's not hard to see why. Scott's vast list of career accomplishments has had a direct and positive impact on both his own students and those across the state.

At Natick High School, where Scott has taught robotics and information technology since 2003, he created a new STEM curriculum and a robotics program, and carved out four STEM spaces within the school while acting as the lead teacher for the Natick afterschool FIRST robotics Team, called ROBONATICK. What started out four years ago with only a handful of students now has 25 students participating, including eight female students, with three teams competing nationally.

"When my daughter started high school, she did not want anything to do with science or technology," said Michele Sweeney, mother of Katelyn Sweeney, a recent graduate who is now attending MIT as a freshman studying biomedical engineering. "However, she found Mr. Scott's inspiring teaching methods and enthusiasm for technology contagious. She went on to take the A+ certification, joined the computer network design team, the Lemelson-MIT InvenTeam, and volunteered each summer at his robotics summer camp for middle schoolers. No doubt about it — this teacher changed my daughter's life."

Last spring, Scott led the Natick High School Lemelson-MIT InvenTeam to the White House Science Fair, where they presented their project — a remotely operated vehicle, or ROV, that can assist firefighters in underwater search and rescue dives for victims trapped under the ice — to President Obama.

The team refined their project along the way with technical guidance from NSRDEC scientists and engineers.

"The mentorship has given them opportunities they would never have had," said Scott of the students. "And it's been great for them to work with professional engineers in a way they would never be able to."

The device is a two-part design that uses a tread-wheeled ROV to traverse the ice to the point-of-entry hole, where an embedded crane then lowers a smaller, amphibious ROV equipped with an underwater camera system into the water. The submersible vehicle then searches beneath the water for the victim, ideally locating and latching onto its target for the rescue diver to retrieve.

The ROV was tested by Massachusetts firefighters and was publicly recognized for its innovation by Bay State Gov. Deval Patrick and President Obama. The ROV is currently under patent review with the U.S. Patent and Trademark Office, filed by the students who developed it.

At the state level, Scott is the lead for a number of other STEM initiatives, including the Massachusetts Business Professionals of America Network Design, which provides STEM certifications focused on the mastery of individual skills, courses in A+ and Mac+ certifications. Scott also co-authors a STEM project summary newspaper that is distributed to multiple teachers across the state, and he developed a "How to start a STEM program from scratch" professional development seminar for Framingham State University's STEM certificate program.

Allison Scheff, the executive director of both the Governor's STEM Advisory Council and STEM at the Department of Higher Education said she believes that Scott is an "excellent example" of a teacher who has gone above and beyond to get students interested in STEM.

"It is our hope that the STEM Teacher of the Year will be able to connect with as many teachers and members of the STEM community across the commonwealth (as possible) to share some of his best practices that have results inside and outside the classroom," Scheff said.

Going green

Buying environmentally preferable products

By Tazanyia Mouton, USAG-Natick Public Affairs / NATICK, Mass. (Nov. 4, 2014)

The Natick Soldier Systems Center workforce was trained on the importance of "greening" the Army mission during a recent green procurement training session in Hunter Auditorium.

According to the U.S. Army Public Health Command, or USAPHC, there are hundreds of ways to go green. Just ask Soldiers who have used absorbent made of crushed walnut shells to clean up their oil spills in the motor pool.

To ensure a healthier workplace and environment, a Department of Defense mandate was issued in 2004 instructing all DOD facilities to purchase green products. Green procurement is the purchase of environmentally preferable products that are made with recycled, less toxic or biobased materials. To be certified green, products have to benefit the environment, protect human health, or conserve natural resources.

Although buying some green products may cost more up front, on a long-term basis, the cost to our nation is minimized. Buying energy- and water-efficient products conserves these resources, and the money diverted from energy and water can then be spent on military programs and the Soldier.

In the 1970s, the federal government recognized the need to identify areas requiring improvement. One of the first areas acknowledged was recycling.

Pat Rippey, an environmental scientist at USAPHC, said programs to support U.S. recycling grew into today's federal purchasing preference programs.

"There wasn't enough incentive to make recyclable products, because no one was buying them," said Rippey. "The first affirmative procurement of recycled products was in the federal regulations."

The DOD goal is to achieve 100 percent compliance with mandatory Federal Green Procurement Programs, or GPP, in all acquisition transactions.

Going green not only sustains the workplace and the environment, but it also creates jobs and saves money.

Rippey said greening our installation doesn't fall solely on the shoulders of management.

"Everybody is responsible (and) makes decisions every day about products and services," Rippey said.

Rippey would like to change the attitude that "we can't green this" into "how can we green this?" She provided many examples where DOD is doing just that, from water-efficient food service equipment to biobased cleaning products used on aircraft.

Richard Valcourt, the garrison environmental engineer, said Natick is working hard to do its part.

"People need to be aware that there are different programs here that are already working on sustainability issues, and we just need to emphasize those amongst one another," Valcourt said.

Beginning the process of going green isn't as difficult as some may think.

"It starts with greening your surroundings, your office environment, your laboratory," said Rippey, "and we have to now make the leap to greening the mission."

Rippey added that the end result is for the Soldier to be greener and, ultimately, healthier.

Holding Court

As part of the Boston Celtics' "Heroes Among Us" program, Natick's Justin Fitch was honored Jan. 5, 2015, at TD Garden. The initiative, established in 1997, honors individuals who have had overwhelming impacts on the lives of others. Through his volunteer work with the "Carry the Fallen" nonprofit organization, Fitch has dedicated himself to reducing the rate of veteran suicides.

Photo: Boston Celtics