

January 31, 2014

NTSSC **This Week**



Natick Systems Center Public Affairs Office



Going **for GOLD** in the **COLD**

Natick tests Olympic fabrics

- Also inside:
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 - Working Dogs
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 - Meet and Greet
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 - Looking Back at Natick



Publisher's Note

John Harlow
USAG-Natick and NSSC Chief of Public Affairs

It's been a great couple of weeks!

Yesterday, the Commanding General of the Army Material Command, Gen. Dennis Via, visited the Natick Soldier Systems Center. He toured the facility and learned about the vital missions done here at Natick on behalf of our Soldiers.

We are putting the finishing touches on the Public Affairs Year in Review book. In 2013, 55 stories written by Bob Reinert, Tazanyia Mouton, Kelly Field or Alexandra Foran were on the Army's homepage. For the second year in a row, more stories from Natick appeared on the Army's homepage than any other installation in the Army. What a great credit to our writers and the subject matter experts.

While on the topic of the writing done by the people who make this newsletter happen, I would just like to make sure everyone understands how we operate.

Our writers conduct an interview with the SME. Then they write the story. We send the story back to the SME for a technical review. This isn't for a re-write. It is for a sanity check to make sure that the technical part of the story is correct. Our writing staff is professional and award winning. Let them tell your story for you.

Speaking of awards, *NSSC This Week* in 2011 won first place and in 2012 was the third place winner of the Installation Management Command's Keith L. Ware Army Journalism Award for Digital Publication. It's the great work by Bob Reinert, Tazanyia Mouton, Kelly Field, Philip Fujawa and David Kamm that makes this a great publication. We are awaiting the results of this year's competition and should be able to share good news soon.

Thanks to all for making *NSSC This Week* an award-winning publication.

John Harlow
USAG-Natick and NSSC Chief of Public Affairs



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Within the Gates

CWF Council

Do you want to help make Natick a better place to work? The Civilian Welfare Fund Council is soliciting one volunteer from each Directorate/Office to serve as a voting member. Members must participate in at least one event during the year, either helping or leading the event.

Have fun, meet new people and make a positive impact at the Natick Soldier Systems Center. Come to the next CWF meeting at Bldg. 1, Carney Hall, Room A-303, Wednesday, February 5, 2014, at 1:30 p.m. for the CWF elections. For more information, contact Chairperson Janice Kopacz at ext. 4205 or Co-Chairperson Duane Young at ext. 4091.

Monthly Caregiver Support Group

Are you following the most important rule of caregiving ... taking care of yourself first?

Join Elder care consultant Sherrie Whittemore to discuss the issues, challenges and solutions of being a working caregiver. This group will focus positively on coping strategies to ease the strain and reduce the challenges of caregiving.

The program will run on the second Tuesday of each month, 11:30 a.m.-12:30 p.m. in the ACS Conference Room. Registration is not required.

For more information, contact Lauren Anzivino at lauren.m.anzivino.civ@mail.mil or (508) 233-4946

Upcoming Events

Family and Morale, Welfare and Recreation announced a number of upcoming events.

They include: Max Courtney live, Feb. 7, 4:30-7:30 p.m.; Valentine's Day paint party, Feb. 14, 5-8 p.m.; P.A. Trick live in the lounge, Feb. 28, 4:30-7:30 p.m.; Chili Cook-Off, March 7, 11:30 a.m.-12:30 p.m.; St. Patty's Day Trivia, March 14, 4:30-6:30 p.m.

For more information, call Sherita Baker at ext. 4791.



Photo Credit: Tom Zikas

Going for GOLD in the COLD

Natick tests Olympic fabrics



Photo Credit: Bob Reinert, USAG-Natick Public Affairs

Dr. Phil Gibson, supervisory physical scientist with the Molecular Sciences Engineering Team at Natick Soldier Research, Development and Engineering Center, explains the Dynamic Moisture Permeation Cell testing he performed on swatches of Burton Snowboard's proprietary clothing.

He shrugged it off as just another routine day in his lab, but testing conducted by Dr. Phil Gibson helped Burton Snowboards pick a fabric for uniforms that the U.S. Olympic Snowboarding Team will wear at next month's 2014 Winter Games.

"They just wanted me to test fabrics," said Gibson, supervisory physical scientist with the Molecular Sciences Engineering Team at Natick Soldier Research, Development and Engineering Center, or NSRDEC. "I do lots of testing for companies, and (Burton is) just one of the companies that asked me to do some testing."

The results of that testing, done last year under a Testing Service Agreement between NSRDEC and the Burlington, Vt., company, were used by Burton to develop its new "DRYRIDE Vaporshell laminate" for the unique patchwork quilt competition jackets that will be worn by such Olympic riders as Shaun White and Kelly Clark in Sochi.

"We're really proud that the 2014 uniform builds on Burton's legacy of creating fun, unconventional designs that stray from the formal, traditional look of most uniforms," said Greg Dacyshyn, chief creative officer at Burton. "The vintage quilt and flag print of the jacket combined with the corduroy pants give the uniform an 'heirloom hippy' vibe that lines up with snowboarding's laid-back culture, while paying respect to America's longstanding creative heritage. It will stand out in Sochi for sure."

Dr. Jack Obusek, NSRDEC director, said that Testing Service Agreements provide "an important technology transfer vehicle that can help promote working with the commercial sector to find military solutions. This provides a great opportunity for us to collaborate with industry, including small businesses, in understanding and advancing the state of the art

in our areas of expertise. Collaborations such as these provide us a great opportunity to engage based on our technical expertise with industry to find solutions for the Soldier."

Well into his third decade at NSRDEC, Gibson, a snowboarder himself, has considerable experience working with well-known outdoor clothing companies.

"This wasn't any different from the testing that I usually do," Gibson said. "The reason I do it is just sometimes I do see things that we would be interested in. So it's a way to kind of have a continuous survey of what the state of the art is.

"We're not endorsing," he explained. "We're just providing information, and they decide how they want to use it."

Gibson performed Dynamic Moisture Permeation Cell testing on swatches of Burton's proprietary clothing. After he developed the DMPC in the NSRDEC laboratories, the Army obtained a U.S. patent for the device and test method in 1999, which has since become a widely used standard in the outdoor clothing industry.

"They didn't even tell me what they were," Gibson said of the swatches. "You're just measuring how much water vapor goes through, how breathable it is.

"I have a set of standards that I test, and then I usually have whatever the company sends, and then I just provide them (with results that compare them to other fabrics)."

When he's not monitoring the commercial market, Gibson works with his Natick team on garments for American warfighters. He is especially proud of advances NSRDEC has made in flame-resistant and chemical-protective materials.

"That's, I think, been one of our big contributions over the past decade," Gibson said. "We've made a lot of advances here at Natick, which have been transferred to industry or are going into prototype garments that we're developing now."

Meanwhile, Gibson will continue to test for companies such as Burton in hopes of coming across materials that can benefit U.S. service members in the future.

"Things have gotten continuously better," said Gibson, "and people understand how to combine different materials together in different environments, even within the same garment."

The new U.S. Olympic Snowboarding Team uniform jacket features the "DRYRIDE Vaporshell laminate," which was tested by Dr. Phil Gibson of the Natick Soldier Research, Development and Engineering Center.

Photo Credit: Burton Snowboards



Free falling:

Natick helps military paratroopers

By USAG-Natick Public Affairs / NATICK, Mass. (Jan. 24, 2014)

Imagine exiting an aircraft at 35,000 feet above sea level, deploying your parachute, and descending for 50 minutes to a drop zone up to 20 miles away before your feet finally hit the ground.

The new RA-1 parachute will make this a reality for the high-altitude parachutist. Product Manager Soldier Clothing and Individual Equipment, or PM SCIE, working with the Natick Soldier Research, Development and Engineering Center, or NSRDEC, is tackling the capability gaps in oxygen supply, navigation and extreme temperatures associated with such missions.

Currently, missions are limited to parachute openings at a maximum of 25,000 feet, due in part to the existing canopy's ability to withstand the opening shock in the thin air of higher altitudes. PM SCIE and NSRDEC researchers are seeking to raise that ceiling to protect aircraft, aircrews and mission support personnel, and allow undetected infiltrations of airborne troops.

"The increased altitude will result in safer missions, and is going to increase the capabilities of the combat commander," said Nina Shopalovich, senior engineer for the PM SCIE Personnel Airdrop Team.

"This RA-1 canopy is going to be fielded to more conventional units as well as Special Ops units," said Dan Shedd, senior project engineer of the NSRDEC Airdrop Technology Team. "We don't know what their final operational range will be, but the objective requirement for this parachute is 35,000 feet. We don't know if we're going to get there, but we have to plan for that."

The RA-1 parachute is capable of achieving 30,000 feet, and the associated parachutist's equipment must also be functional.

Paratroopers need oxygen, navigation and thermal-protective clothing systems that can operate reliably at minus 60 degrees Fahrenheit. To that end, researchers recently engaged the NSRDEC Doriot Climatic Chamber's Arctic Chamber to run tests on the new parachutist oxygen bottle and Android-based navigation system. They suspended two retired military paratroopers from the chamber's ceiling and sat a third paratrooper on a chair, all in combat equipment, breathing from parachutist oxygen equipment. The temperature was set to 20 degrees below zero and the wind speed at 20 knots -- a wind chill of about 50 below zero.

Though the equipment performed well, during the test the engineers observed how inadequate current thermal-protective gear is for the mission.

"It was atrociously cold," Shopalovich said. "It is so cold that any kind of moisture in the air immediately turns into frost. It is scary. It really does give you an idea of the fact that it's very, very dangerous."

As Shedd pointed out, it's not just the cold at altitude that challenges the paratroopers on stand-off, High Altitude High Opening, or HAHO, missions, it's the perspiration generated in the jump preparation that's dangerous.

"We've seen swings in temperature of as much as 140 degrees throughout the mission," said Shedd, adding that paratroopers have boarded planes and jumped into areas in excess of 100 degrees.

"It's not just the cold," said Andy Margules, a mechanical engineer with the NSRDEC Airdrop Technology Team. "We can do cold. It's the hot to cold to hot again that really will just suck the energy out of you."

"Mountain clothing doesn't quite work. Ski clothing doesn't quite work. Arctic clothing doesn't quite work, because it's so bulky, and then you have all this moisture that's in there," added Margules.

Any moisture will freeze on the parachutist's body or his clothing, and it could possibly hinder the operation of his breathing and navigation equipment. The extreme temperatures, combined with the mismatch of available equipment, often leads to losses in dexterity -- affecting the paratroopers' mission effectiveness upon landing.

According to Shedd, a paratrooper under the RA-1 canopy will descend about 3,000 feet every five minutes as temperatures warm two to three degrees every 1,000 feet. Once he lands, a paratrooper must be ready for combat as quickly as possible.

"We just want the guys to be able to function when they hit the ground," Shedd said. "You don't want them to be stripping stuff off once they hit the ground."

Researchers at Natick hope to help the Army realize the full potential of the RA-1 parachute.

"Let's face it -- if anybody's going to do it, it should be Natick," Shedd said. "We've got the airdrop experience. We've got the clothing experience. Natick is the place that should work these efforts."



“Blitz” and officers from the Plymouth County Sheriff’s Department recently came to the U.S. Army Research Institute of Environmental Medicine to meet with scientists from USARIEM and MIT Lincoln Laboratories, who are involved with the program to evaluate thermal stress in Military Working Dogs, which is led by Kate O’Brien, a research physiologist with USARIEM, pictured with Blitz.

Last summer, Ken Ballinger, a K-9 officer with the Plymouth County Sheriff’s Department, was conducting a training session with working dogs on a hot and humid New England day.

For safety, Ballinger had arranged for two veterinarians and three paramedics to be on site. When the dogs were not working, they were resting in air-conditioned vehicles and checked on every 15 minutes. On one of these routine checks, Ballinger’s dog, “Blitz,” a 3-year-old Shepherd, did not respond.

The vehicle had failed, so that instead of blowing cool air, 200-degree engine air flowed into the cabin where Blitz was. Blitz was unconscious when he was pulled from the vehicle. Emergency treatment began immediately, including application of ice packs, administration of intravenous fluids and rapid transport to Angell Animal Medical Center, located only five minutes away.

An hour later, Blitz’s core temperature was still 109 degrees, far above normal; yet within two weeks he was back to work. In the veterinary community, this was the highest temperature documented with survival.

“Heat stress is a significant concern for military working dogs, both during training and deployment,” said Kate O’Brien, a research physiologist at the U.S. Army Research Institute of Environmental Medicine in Natick, Mass. “If heat illness occurs, even if it is not fatal, MWDs are often retired from service, resulting in loss of a valuable resource that is costly with respect to both time and money.”

USARIEM’s Biophysics and Biomedical Modeling Division is working with the Massachusetts Institute of Technology’s Lincoln Laboratory to solve this problem through a program to examine thermal stress in military working dogs.

“Real-time physiological monitoring can be used in humans to identify individuals who are at risk of excessive heat strain,” said O’Brien.

For example, O’Brien said, Weapons of Mass Destruction Civil Support Teams have used handheld “buddy” displays to see when an individual is becoming too hot and could use that information for better mission management.

“A similar approach could be used with MWDs to send information to the handler when the dog is overheating,” O’Brien said. “The handler could then take action to both avoid performance degradation and reduce risk of heat illness.”

O’Brien said that while heat illness occurs less often in civil working dog populations, sometimes things happen despite your best efforts to prevent it.

A few months later, Blitz had an implanted temperature sensor in his chest. Data is transmitted so that handlers can monitor Blitz’s temperature in real-time, as well as be alerted if he reaches a critical preset threshold temperature.

“It may not be feasible to surgically implant every MWD with a temperature sensor,” O’Brien said. “However, USARIEM has demonstrated in humans that heat tolerance can be tracked in real-time using data obtained from non-invasive physiological measurements in combination with algorithms and models that predict core temperature.”

This capability for monitoring humans was developed through USARIEM’s expertise in thermal physiology, biophysics and mathematical modeling. Expertise from MIT Lincoln Laboratory in signal processing, data storage and microprocessing contributed to the methodology for transmitting this

“USARIEM has demonstrated in humans that heat tolerance can be tracked in real-time using data obtained from non-invasive physiological measurements in combination with algorithms and models that predict core temperature.”

**Kate O’Brien,
research physiologist, USARIEM**

By Kelly Field, USARIEM Public Affairs / NATICK, Mass. (Jan. 31, 2014)

Working Dogs

**USARIEM
studying how to
cool K-9s**

information to the individual. Together, USARIEM and MIT Lincoln Labs are currently working on a very low power, size and weight physiological status monitoring system for humans. This same approach is being applied to monitoring heat strain in MWDs.

“Through partnerships with the MWD community, local police K-9 units, and MIT Lincoln Labs, USARIEM will be developing products and strategies to reduce heat injuries and sustain performance in working dogs for military and law enforcement,” O’Brien said.



AMC commander: Natick 'critical' to Army, nation

By Bob Reinert, USAG-Natick Public Affairs / NATICK, Mass. (Jan. 30, 2014)

The commanding general of the U.S. Army Materiel Command visited Natick Soldier Systems Center to learn more about what is done on the installation to support America's warfighters.

Gen. Dennis L. Via received briefings and witnessed demonstrations about Soldier systems engineering architecture, female body armor, the Improved Outer Tactical Vest, the Doriot Climatic Chambers, the Physical Demands Study, Product Manager Force Sustainment Systems, aerial delivery, Soldier power-wireless transmission, multi-functional fibers, vision protection and nutrition.

"Everything that we do to sustain the Soldier, and improve the performance of that Soldier, and protect that Soldier, and provide for quality of life is being done here," Via said. "So it's been a phenomenal visit."

Via pointed to the Soldiers who come to Natick fresh out of Advanced Individual Training to spend 90 days as human research

volunteers in experiments, before moving on to the initial assignments of their Army careers.

"I think that was a highlight," Via said. "I'm extremely impressed with the Soldiers."

Among the many technologies that stood out, Via mentioned "advancements in power and being able to lighten the load of what our Soldiers are carrying today -- some of the wireless capabilities that are being built. I think that was just absolutely phenomenal."

He added that he enjoyed speaking with scientists and engineers about "how they're researching those leap-ahead technologies for our Army -- very important work, across the board."

Via called Natick's work critical to AMC's mission of supporting the warfighter, today and tomorrow.

"We have to invest in research and development and science and technology to continue to make sure that our Army and our forces have that technological advantage that we

Gen. Dennis L. Via, Army Materiel Command commander, visited Natick Soldier Systems Center, Jan. 30, 2014, to learn more about the important work done there for warfighters.

helped build over the past decade-plus of war," Via said. "We want to continue to maintain that ahead of any potential adversary in the future."

No stranger to Massachusetts, Via earned his master's degree from Boston University. He said that he appreciates the importance of Natick Soldier Systems Center's proximity to some of the nation's finest colleges, universities and technology companies.

"I think it's critically important to continue to attract bright men and women, both those who want to join and serve our Army, (and) also those who want to join and support our Army as Department of the Army civilians," Via said. "This is an area very rich in being able to provide personnel who have those types of degrees (and) experience that can help us achieve our goals."

Via said he looked forward to seeing what Natick would produce in the future.

"It's a critical capability for our Army," said Via, "and it's a critical capability for our nation."



Meet and greet Natick welcomes new HRVs

By Tazanyia Mouton, USAG-Natick Public Affairs / NATICK, Mass. (Jan. 29, 2014)

For the first time ever, the personnel working at the Natick Soldier Systems Center were able to put faces to those busy testing new systems behind the scenes ... the Soldiers.

"Often, we perform outreach with the local community and schools, but we are missing a great opportunity to perform 'in reach' with the Soldiers," said Dr. Matt Kramer, chief, Science, Technology and Innovation Division, Natick Soldier Research, Development and Engineering Center, "informing them about what our broader mission is and making their limited time here as valuable as possible."

"Operation in Reach" allowed the newest group of Soldiers at NSSC to tour various labs as well as participate in a meet and greet that took place Jan. 23.

"We hoped to spark an interest in building relationships between the Soldier and civilians," said Sarah Ross, Human Research Volunteer coordinator. "We also wanted to include the Soldiers in what happens on post more than just participating in studies."

Ross said having the Soldiers meet and converse with the scientists, administrators and other employees could also help the Soldiers realize if they didn't choose to make a career of the Army, there were still options for them in science and technology.

The turnout for the event shocked all who planned the occasion.

"We had 74 civilians sign in, 31 HRVs and 14 other active military members attend," said Ross. "That's huge for something that we had never done before or had any expectation in regards to attendance."

One such Soldier that NSSC employees were able to meet was Pvt. 2 Duane Patterson. Patterson, 20, joined the Army in May 2013.

"It started off as a curiosity," Patterson said. "I never originally had any plans about going into the military."

Patterson said he wasn't aware of what the military could offer until his freshman year in high school, when he joined the Air Force Junior Reserve Officers' Training Corps or AFJROTC.

"It caught my attention, it fascinated me," Patterson said, "and as the years progressed and I stayed in the program, I became better and better at what I did there."

Through the AFJROTC program, Patterson was able to hone his skills as a leader as well as compete on a national level.

"I wanted to achieve things that others weren't doing," Patterson said. "So I set my eyes on getting as many ribbons and awards as I could, while also bettering myself."

Pvt. 2 Duane Patterson and Pvt. 2 Marquvious Hyman stand together at the first-ever Human Research Volunteer meet and greet at the Natick Soldier Systems Center Jan. 23. The meet and greet was a chance for NSSC personnel to put a face behind the word "Soldier" and helped bridge the gap between Soldier and civilian.

Through his AFJROTC career, Patterson was able to obtain an astonishing 43 ribbons and 10 awards.

"I always wanted to do something better with my life," said Patterson. "If I would have never (gone) through JROTC, I probably wouldn't be in uniform today."

Another such Soldier with an interesting story was Pvt. 2 Marquvious Hyman, 19, who decided to push aside a lifetime dream of his to join the Army.

"I grew up playing football all my life, and I loved the sport," said Hyman. "I loved the atmosphere and being on the field; I loved everything about it."

Hyman said through middle and high school, football was a struggle, but he strived to make himself a better player and had dreams of one day playing in the NFL.

During Hyman's last year in high school, he received a full-ride scholarship to attend and play football for Georgia State University. Hyman, feeling differently about the sport, didn't rush to pick up his Panthers uniform and helmet.

"My senior year I started viewing more options," Hyman said. "The more I worked toward my main goal of playing college (and pro) football, it made me realize that football wasn't really everything; there's a lot more options out there, and I started losing passion for the sport."

At that point, Hyman began to think about the military and the opportunities and doors it could open for him and his family.

Hyman said he still dreams of one day going to college and playing football; but for now, he will do all he can while in uniform.

"If you really want something, keep working hard for it; over time it will come," Hyman said.

"I am very pleased that so many civilians showed up to meet the Soldiers today," said Col. Collier Slade, military deputy, NSRDEC. "It is a real testament to the workforce and their dedication. These young Soldiers are our customers, and anytime that you can put a face behind the word 'Soldier,' it is very motivating."



NSSC This Week

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About this newsletter

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

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