Soldiers from the U.S. Army Nuclear Disablement Teams demonstrate field use of the Ortec High Purity Germanium (HPGe) detector during a training exercise. U.S. Army photo by Maj. Steven M. Modugno.

ARMY TEAM LEVERAGES EXPERTISE TO INCREASE READINESS FOR RADIOLOGICAL DETECTION MISSIONS

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A team of Soldiers and U.S. Army civilians recently came together to design a better backpack. Soldiers from the U.S. Army Nuclear Disablement Teams helped to conceptualize, coordinate and create a backpack that helps them to provide theater-level confirmation and identification of radiological materials in a tactical environment.

The Nuclear Disablement Teams worked with partner organizations, including the Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center from the U.S. Army Combat Capabilities Development Command.

Maj. Aaron J. Heffelfinger, the deputy team chief from Nuclear Disablement Team 1, said the new mobile backpack was the result of a six-month project. “The challenge the NDT always had with its Ortec High Purity Germanium (HPGe) detectors was always the deliberate cool down period required for the equipment to be ready, typically in excess of seven hours from a complete shutdown,” said Heffelfinger, a native of Moore Township, Pennsylvania, who previously served as an Air Defense Artillery officer.

Since the detector needs to draw outside air for its internal cooling system and needs to expel this hot air to maintain cryogenic operating temperatures, Heffelfinger said the cases that came with the detector required the equipment to be shut down during transportation. The team members would have to either wait for around eight hours to use their best gamma detector or transport it unprotected with nothing more than a shoulder strap.The backpack enables the NDTs to move faster and provides commanders with greater operational flexibility. “Time is always of the essence. The longer it takes the team to provide the gamma spectroscopy and isotopic assay results to the supported unit, the more constrained the commander becomes,” said Heffelfinger. “If we can provide that information without an 8-hour cooldown first, it can drive the decision-making process that much faster.”

Capt. John M. Prevost, an Army Explosive Ordnance Disposal officer from Nuclear Disablement Team 2, said the power and cooling systems are self-contained and interchangeable with a range of batteries and store power on the backpack. The detector can remain operational almost indefinitely with the new backpack, said Prevost, adding that it can be used anywhere a Soldier can carry it. By allowing the NDTs to carry spectral analysis software on a target downrange, the backpack eliminates the need for reach-back support if communications become degraded.

ABOVE: The newly designed backpack system that helps Nuclear Disablement Teams to provide theater-level confirmation and identification of radiological materials more quickly in a tactical environment. The Nuclear Disablement Teams worked with partner organizations, including the Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center from the U.S. Army Combat Capabilities Development Command. Courtesy photo.

“This new backpack provides a protective, continuously-cooling, man-packable solution for bringing our most critical detection equipment to a target,” said Prevost. “The backpack makes our most critical detection and analysis capability smaller, lighter, faster and more ruggedized for expeditionary deployments.” Prevost said the improved backpack was the result of an on-going NDT discussion on existing capability limitations and doctrinal requirements.

“The backpack is proof that the best way to solve complex problems is to assemble teams of experts from varied backgrounds and establish a common vision of success, especially during initial design,” said Prevost, a native of Shelby, North Carolina, and graduate of Wofford College, who served as a platoon leader in the 21st Ordnance Company (EOD), a one-of-a-kind Weapons of Mass Destruction-focused EOD company. “By doing this, you gain varied perspectives on potential problems, existing or innovative design solutions and end-user considerations early in the process,” said Prevost. “Put simply, a small group of motivated experts can accomplish a great deal in an environment where ideas and input are openly traded regardless of rank, education or background expertise where mission success is the sole collective focus.”

Jaywoon Joo was one of the experts who worked on the backpack project.As a U.S. Army civilian project engineer at the C5ISR Center, Joo regularly supports organizations by rapidly prototyping services for them. Originally from San Diego, Joo studied mechanical engineering at the University of Nevada-Las Vegas before moving to Maryland. “My father, Bill Joo, is my main inspiration for becoming an Army civilian,” said Joo. “He has always explained that our work is important - not only because it helps us to win wars - but because it ensures our Soldiers come home safe to their families. I’ve always found that idea to be really inspiring and it’s why I’m working here today.”

The Nuclear Disablement Teams are part of the 20th Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) Command, the U.S. military’s premier CBRNE formation. The U.S. military’s only Nuclear Disablement Teams — NDT 1, NDT 2 and NDT 3 – are all stationed on Aberdeen Proving Ground, Maryland. As the U.S. Department of Defense’s nuclear subject matter experts, NDTs directly contribute to the nation’s strategic deterrence by staying ready to exploit and disable nuclear and radiological Weapons of Mass Destruction infrastructure and components to deny near-term capability to adversaries. The NDTs facilitate follow-on WMD elimination operations. ■

ABOVE: A Soldier from the U.S. Army Nuclear Disablement Teams conducts a field radiation survey in training while carrying the new backpack designed to carry the Ortec High Purity Germanium (HPGe) detector. U.S. Army photo by Maj. Steven M. Modugno.

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