USARIEM researchers test WPSM capabilities

U.S. ARMY SOLDIER SYSTEMS CENTER - NATICK PUBLIC AFFAIRS

NATICK, Mass. – Researchers from the U.S. Army Research Institute of Environmental Medicine got a chance to test out one of the products they have been working on in an exercise scenario.

The Warfighter Physiological Status Monitor lets an observer view heart rate, respiration and core temperature from a remote location. Although intended for medical personnel to monitor the critical vital signs of warfighters on the battlefield or in training, it also has other uses.

In June, USARIEM worked with the National Guard 1st Civil Support Team, Weapons of Mass Destruction, out of Wellesley, Mass., during two training exercises. The mission of the CST-WMD is to support civilian authorities in the event of a WMD incident. Their tasks include advising local authorities and assisting with response.

Nationally, the CST-WMD has been looking for a medical monitoring telemetry system for a couple of years, said Mark Buller, physiologist, USARIEM. Currently, when the members of the CST-WMD are wearing chemical/biological personal protective equipment, they have to work with a buddy system and only have external physical signs to work with (e.g., their partner begins to stagger as they walk or is unresponsive to verbal commands).

"They wanted to ID a system that would let them monitor core temperature, heart rate and ECG traits," said Buller. "We have been working on Warfighter Physiological Status Monitoring systems for more than 10 years and thought we had a system mature enough to be a good fit. The prototype of the system met most of their needs."

A partnership was created between the two organizations (USARIEM and the 1st CST-WMD Team) and USARIEM first traveled to a training exercise in North Truro, Mass., to get a better understanding of the CST-WMD mission.

Next, they traveled to North Brookfield, Mass., and outfitted members of the CST-WMD team performing first-responder-type work with the WPSM system during actual training exercises.

COURTESY PHOTO

Members of the National Guard 1st Civil Support Team, Weapons of Mass Destruction, test the Warfighter Physiological Status Monitor in first-responder-type situations in Brookfield, Mass.

"We want potential users of the WPSM system to try it out in a real environment to see if it will meet their needs," said Bill Tharion, principal investigator, USARIEM. The first exercise in North Brookfield involved members of the CST-WMD performing first-responder-type work in their PPE in enclosed spaces, such as in a tight sewer system and septic tanks.

Six individuals were equipped with the WPSM system with a strap that goes over their chest and shoulders. An electronics unit that snaps into the chest strap that gathers and processes the physiological information obtained from the strap sensors was also worn.

"This system differs from the chest straps available on the sports market," Tharion emphasized. "Although those systems also have a chest band which sends your heart rate information back to a watch, the WPSM system provides a lot more information and also provides more reliable information. The WPSM was a system developed to detect vital signs," he said.

"The [WPSM] can even tell you if a device is broken or not on," Buller added. During the exercise, a physician's assistant from the 1st CST-WMD observed the information provided by the WPSM system, such as heart rate and respiration.

"The system worked great," said Buller. "We were able to monitor the individuals reliably with no equipment failure and were able to get good data."

The second exercise was on a firefighter training site with large containers that had restricted entry through only a manhole. The setup for testing the WPSM system was the same as the first exercise, but the day was warmer, with temperatures in the containers reaching between 80 and 90 degrees.

"This gave us a good opportunity to see how the item works in the field," Tharion said. "It also gave us the chance to ask if the item meets this group's needs and, if not, what else they would like to see."

The WPSM system was a useful tool for the CST-WMD. The medic is able to see where a problem might arise, such as heat stress, and send out a new individual to cover for the one who might be starting to be in danger, said Buller.

Tharion stressed that the WPSM is a device that would supplement a normal level of care, not replace it. For the future, USARIEM is working on algorithms based on vital signs, such as core temperature, and types of exercise being done to predict work/rest cycles. "These will let us predict schedules with relative reliability," said Tharion.

Regarding working with the 1st CST-WMD, both Buller and Tharion thought it was a success. "They have been great to work with," said Tharion. "It's truly become a partnership."