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## Army Innovators Prototype Deployable Microsensors Concept

*By Robin Schumacher*



**Attendees examine a commercial-off-the-shelf chemical sensing puck alongside the WILE-E 3.0 Modular Deployable CBRN Microsensor Concept Puck used during a Deployable CBRN Microsensor Integration Experiment at Aberdeen Proving Ground. (U.S. Army Photo by Michael Phillips)**

**Aberdeen Proving Ground, MD** -- A team of innovators at the U.S. Army Combat Capabilities Development Command Chemical Biological Center (DEVCOM CBC) have been working on an art-of-the-possible concept for a system of deployable chemical, biological, radiological and nuclear (CBRN) microsensors.

This effort is part of a Center program called Warfighter Innovation Leveraging Expertise and Experimentation (WILE-E). The WILE-E initiative brings together a multidisciplinary

team of Center scientists, engineers, technicians, analysts, and logisticians to solve real-world operational challenges. They use the concept of design thinking with upfront and continued end-user engagement and a commitment to prototyping and experimentation.

The third iteration of the DEVCOM CBC WILE-E program, known as WILE-E 3.0, is focused on CBRN deployable microsensors. "The warfighters present a problem statement that they are trying to achieve a solution for, and we pull together these scientists and engineers to deep think into the problem statement. They then come up with courses of action, solutions, and then present their ideas," said David Glynn, DEVCOM CBC liaison officer at the Maneuver Support Center of Excellence.

One of WILE-E 3.0's goals is to help inform future requirements for deployable CBRN microsensors to develop an enduring capability for the CBRN community and the Army. "The goal is to show the art-of-the-possible to inspire the stakeholders and warfighters who are writing requirements today for the materiel of tomorrow," said Dr. Jennifer Sekowski, the lead for the WILE 3.0 team. "Showing them what is possible lets them know we are starting down the path of technology development towards a product that the warfighter wants, needs, and will be happy to use in the future."



**DEVCOM CBC Senior Research Scientists Dr. Peter Emanuel and Dr. Patricia McDaniel engage with Capt. Jorge Munoz-Negron and CW3 Macio Brown from the Futures and Concepts Center during the Deployable CBRN Microsensor Integration Experiment. (U.S. Army Photo by Michael Phillips)**

The team set out to achieve this goal by collaborating with many industry and government stakeholders to understand what state-of-the-art technology exists today and what will be required for a system of deployable microsensors to meet the warfighter's needs. In particular, they worked with Glynn and individuals from the Futures and Concepts Center's (FCC) Maneuver Support Capability Development Integration Directorate (MS CDID) to take a desired set of characteristics and turn it into a viable product to help inform written requirements.

"The WILE-E team helped us create the idea for what the microsensors would be," said Capt. Jorge Munoz-Negron of FCC's MS CDID. "They began with science and technology research, our current limitations, and what we can and cannot yet employ. We then refine how we plan on employing our findings once it becomes an actual program of record for the military."

The team discovered that a system of systems approach with five integrated modules – sensing, communication, processor, power, and deployment – would be the most effective. System modularity is critical to the team's concept, as it will allow the technology to advance without impacting agile development towards an integrated and readily updatable architecture. This system modularity will also enable the use of multiple types of sensors within a typical architecture and minimize the training required to use the microsensors.

Working with key stakeholders from the FCC; the Defense Threat Reduction Agency; and the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense, Joint Project Manager for CBRN Sensors, the CBC WILE-E 3.0 team executed an integration experiment at Aberdeen Proving Ground in Edgewood, Maryland where they demonstrated current technologies, experimented with the integration of these technologies, and explored ongoing conceptual work for capitalizing on these integrated technologies in a tactical environment.



**The CBC WILE-E 3.0 team showed existing technologies that can be used to deploy the CBRN microsensors, one being an unmanned aerial vehicle. (U.S. Army Photo by Michael Phillips)**

Scientists and engineers from across the Center, including the Battlefield Integration Branch; the Advanced Design and Manufacturing team; and the Sensors, Signatures, and Aerosol Technology Branch, lent their expertise to the CBC WILE-E team to successfully execute the experiment. Partners from the DEVCOM C5ISR Center, Naval Research Laboratory, Design West Technologies, and Lyten, Inc. also contributed to the event's success.

While the deployable CBRN microsensor integration experiment validated the team's concept and feasibility of the technology and development approach; the work is ongoing. "This was an exciting event, and we saw some of our ideas come into technology and materiel," said CW3 Macio Brown of FCC's MS CDID. "It's a great opportunity to bring together other programs so we can develop this capability and get it into the Soldiers' hands as soon as possible."

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For more information about the DEVCOM Chemical Biological Center, visit <https://cbc.DEVCOM.army.mil>

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