




Science and Technology (S&T) Snapshots

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The U.S. Department of Homeland Security's Science & Technology Directorate (S&T) newsletter, S&T Snapshots, features stories about current research projects and opportunities with laboratories, universities, government agencies, and the private sector.

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Toxic chemicals spilled in Los Angeles, but the expert is in Los Alamos? No problem!

A new detection system beams readings from the hot zone to scientists around the world.

Good decisions are never more critical than in a crisis. For a HAZMAT squad, the time to start making them could be the instant a dock worker's eyes burn from a cargo container leak. Making the right decisions is no walk on the pier. Foggy face masks and full-body protective suits can obstruct the tiny display screens HAZMAT responders use to monitor and record the scene. The implications of what they can or cannot see are not always obvious. They are not walking encyclopedias and even if they were, security policies limit what could be said openly over the radio.

To help overcome these obstacles, the U.S. Department of Homeland Security Science and Technology Directorate (S&T) has helped build a device that can quickly beam data on chemical toxins, biological agents, and dirty bombs from the hot zone to the desktops of HAZMAT hotshots around the world. With a few clicks of the mouse, specialists and scene commanders can share information and collaborate on what they see. Decisions can be made better, faster. Meanwhile, evacuation calls can be sent out automatically to nearby homes and businesses.

The Los Angeles area program, known as the Integrated Chemical, Biological, Radiological, Nuclear and Explosive (ICBRNE) Detection Demonstration pilot, has brought together sensor manufacturers, application developers, communication companies, and system integrators to build this comprehensive detection system called the [ICBRNE System](#).

S&T, in partnership with private companies Safe Environment Engineering, Vialogy, and Optimetrics, developed the system as a "true team," said Los Angeles Fire Department Battalion Chief Bob Cramer. (Watch Cramer and other first responders talk about ICBRNE in the video.)

The ICBRNE system uses standard, commercially available sensors to wirelessly relay live readings to experts. It's a form of tele-detection, where experts see a replica of the instrument's face plate and its location viewed on top of a map of the scene. The information can be shared through a simple Internet browser.

"ICBRNE meets our need to get real-time instrument readings to the right people at the right time no matter where they are, which is a critical part of any emergency response," said Kathleen Kaufman of Los Angeles County Radiation Management, whose office used the technology throughout the pilot project.

Already, the system has been deployed at major events like the Tournament of Roses parade, the Emmy awards, and most recently, the Academy awards.

What started as a telemetry system to check on employees and their instruments every 30 seconds in a potentially hazardous facility, the system now streams live sensor data across cities, counties and the nation, thanks to the Technical Support Working Group, a homeland security grant, and S&T's Chemical and Biological Division and the Office of Interoperability and Compatibility in the Command, Control and Interoperability Division.

A quarter century ago, a system like ICBRNE would not have been possible because of conflicting data requirements and federal standards for various chemical, biological, and radiological threats. Today, there is no limit on how many different substances can be integrated and transferred using the system.

In addition to its use in Los Angeles, ICBRNE is now spreading to others cities throughout the nation. "Our ultimate goal would be to establish ICBRNE capability in 30 cities over the next 10 years," said Teresa Lustig, ICBRNE's program manager at S&T.

The ICBRNE System continues to evolve and develop as more agencies either integrate their old equipment or buy new versions. While cost estimates have not been finalized, S&T expects that even small cities will benefit from better, broader detection, and big bucks worth of savings.

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