Los Angeles County Prepares for a Nuclear Explosion

By: Elaine Pittman on November 17, 2010

Creating a common operating picture for all responders in an emergency is essential to taking appropriate action and keeping everyone safe. Hazardous materials incidents, however, create unique problems for response teams because their protective suits often make it difficult to read instrument screens, and if subject-matter experts aren't on scene, responders must find ways to relay the information back to them.

The U.S. Department of Homeland Security (DHS) Science and Technology (S&T) Directorate partnered with private and public organizations to build a device that can connect to a HAZMAT instrument and wirelessly send its information to the command station, as well as to subject-matter experts and others who need the data. More than two years ago, the Los Angeles County operational area — which includes 88 cities, 137 unincorporated areas and 288 special districts — began a pilot of the Integrated Chemical, Biological, Radiological, Nuclear and Explosive (ICBRNE, pronounced "I C bernie") program, which uses sensors to monitor, report, display and alert officials if such materials are detected.

The project began as a way to improve the safety of first responders going into hazardous environments, said David Lamensdorf, an ICBRNE subject-matter expert for the S&T. To detect chemicals and other hazardous materials, "They bring instrumentation … with tiny little displays, and trying to view this data in the field can be a little bit challenging, especially as it goes through fogged-up face masks and such," he said. To address this problem and the need for interoperable data sharing, the ICBRNE system works with off-the-shelf HAZMAT sensors to wirelessly send live readings to subject-matter experts and other first responders a safe distance away from the incident.

"We were trying to take their existing equipment and information systems and use open standards and communications protocols to allow them to share that data and information seamlessly with whoever needed it — and with the right amount of information so they could respond appropriately," said S&T Program Manager Teresa Lustig.

Lamensdorf, also the president of Safe Environment Engineering, which makes wireless data transmitters, said three parts constitute the system:

1. A Lifeline Interoperable Network Communicator, called a dongle, connects to the first responder's instrument and sends the raw data to a computer application that emulates the instrument's screen.

2. A gateway allows the data to be transmitted over the Internet. The gateway takes a local area network and puts it onto a wide area network, which lets people who aren't at the scene view the information online.

3. The data is transmitted through global standards so it can be shared using an agency's tool of choice. "If a response organization has a specific tool display mechanism they want to view the data in, as long as it can work to these standards, it can take the data and present it," he said. "We like to think we've created a common operating picture of data; everybody's working off the
same data."

Putting it to the Test

In December 2009, the Pacific Northwest National Laboratory approached the Naval Postgraduate School's Center for Asymmetric Warfare (CAW) about a DHS project to test the ICBRNE program. Testing a system

that spans a large area isn't an easy undertaking, and CAW has experience conducting multiagency, large-scale training and exercise events. Los Angeles, with its ongoing ICBRNE pilot, was declared the drill's venue, and the exercise would focus on the detonation of an improvised nuclear device.

Although the DHS S&T sponsored the exercise, dubbed Operation Golden Phoenix (OGP), L.A. County led the project, Lustig said. "They selected the scenario themselves," she said. "They wanted to choose this improvised nuclear detonation, which I think is the most challenging."

CAW took on the planning and facilitating role, and began by creating a planning team that comprised the exercise's key players, including L.A. County's Office of Emergency Management and its Public Health Department's Radiation Planning Group, and the L.A. city Emergency Management Department, according to Brendan Applegate, an exercise manager with CAW.

"We got those agencies together, asked if they were interested in participating in such an exercise, and developed objectives for the effort," Applegate said. "We developed an exercise plan that would test the ICBRNE system and also allow these other agencies to achieve some of their own training and exercise objectives."

Scott Brewer, an emergency manager for CAW, said one of the difficult things with involving so many agencies — more than 135 participated — is compelling them to play. Including their objectives and helping them accomplish some of their annual exercise requirements and training goals is important, he said.

The OGP was more expansive than a one-day exercise; it took place over about two months and involved: a seminar hosted by L.A. County on radiation management and nuclear weapons; tabletop exercises; a communications exercise; an ICBRNE demonstration; outreach presentations to the county's cities and agencies; and a functional exercise.

A major benefit of exercises like the OGP is that they help identify people's roles during an emergency and "expected surprises," said John Fernandes, administrator of the L.A. County Office of Emergency Management. "There are a lot of unexpected and expected surprises in a lot of ways, because that's what emergencies are," he said. "Emergencies are going to give you expected surprises with respect to a certain number of casualties, a certain number of problems with reaching people who have problems getting water in the aftermath or shelter if they need immediate shelter."

Nuclear Response

In late July, the functional exercise began when participants were notified that a 10-kiloton improvised nuclear device was detonated in L.A. It was quickly deemed an act of terrorism, and a mock newscast reported that there was a massive number of casualties. Emergency operations centers (EOC) were filled with players from various agencies in preparation for the drill, and the exercise's emergency response was under way.

Brewer explained that during the function exercise, numerous EOCs and department operations centers were activated and everyone took on their emergency management role. However, there wasn't any field play, he said, meaning a CAW-run control cell supplied situational awareness to the participants, as did mock news

reports and field incident action reports to paint a picture of what would be happening outside building walls following a nuclear explosion.

“They don’t really have a good view of what’s going on in the outside world, so they rely on information coming in through news reports, TV, phone, e-mail, other agencies talking with them on the phone or via liaisons to get information,” Applegate said. “They’re not actually in the field looking at all these things going on.”

The control cell also simulated the agencies that weren’t participating. For example, FEMA wasn’t participating, so if someone needed to contact it during the drill, he or she would call the control cell where the agency’s role was simulated.

The ICBRNE system was used during the drill to provide a common operating picture to all the participating agencies. However, incorporating it into the drill was a challenge, Brewer said, because the first responders who work with it in the field were already familiar with the system, but this was a chance to give emergency management and public health officials a chance to learn about it. “They got a good opportunity to work with the product [and] the technology,” he said. “I think everybody went away with some good ideas about how they can benefit from that program and project.”

The system’s effectiveness during the drill was evaluated through the DHS’ process, and Lustig said the S&T will receive a report card on it. But it isn’t the only aspect that was assessed. An evaluation team examined the actions performed during the drill and checked them against the exercise objectives and the Homeland Security Exercise and Evaluation Program’s national standards.

As of press time, the after-action report wasn’t available, but Brewer identified two key findings:

- No. 1: The response to this type of incident will be regional. “No matter where this occurs, it will be a regional, multiagency response,” he said. “There’s no one agency that’s going to have the resources, and it’s never going to stay within the jurisdiction of one agency.”

- No. 2: Although the response will initially be to a terrorist attack, long term it will be a public health emergency because of the management of radiation exposure, contaminated areas and responder safety.

Forging Partnerships

The OPG allowed the L.A. area to enhance its regional relationships and information sharing techniques by also testing its Operational Area Response and Recovery System, a Web-based system that allows them to wirelessly share situational response information.

“Whether I am here at the office, at home or in the field and we have an incident take place, I’m able to access the system and see what the situation is in various cities,” said Ken Kondo, public information officer for the county’s Office of Emergency Management. “It provides information to the emergency responders and managers so they can start to plan what the next steps are going to be.”

In addition to creating partnerships with the different governments within the county's operation area, Kondo also stressed the importance of working with local media, because people will turn to news outlets for information on a disaster. Educating reporters and producers on the recommended actions people should take following a disaster will allow them to repeat the county's messages to the public following an emergency.

The Golden State is well known for earthquakes and has spread prescripted messages like "drop, cover and hold on," and Kondo would like to establish similar messages for other potential disasters.