

BY CAREY HARRINGTON

## HAZOPS® TECHNOLOGY BRINGS INTEROPERABILITY TO LAFD HAZ-MAT SQUADS

**T**HE CONCEPT FOR LOS ANGELES City Fire Department (LAFD) HazOps® Squad 4 was born of a conversation that took place at a conference between David Lamensdorf, president/CEO of Safe Environment Engineering (SEE), and members of the LAFD Haz Mat Team. Lamensdorf was demonstrating the company's interoperable system at the time. When the LAFD and the Los Angeles Police Department (LAPD) members saw how the system could transmit signals from harsh environments to an external viewer, one of the haz-mat team members walked Lamensdorf over to his car, popped open the trunk, and pointed to several gas, radiological, and chemical meters. "Look at this," the haz mat team member said; "nothing is linked. Besides that, I can't even read the meters in level A suits."

With that problem in mind, Lamensdorf began a four-year journey into interoperability and first response. The ultimate result was the HazOps® system the company developed for the LAFD, LAPD, and Los Angeles Sheriff's Department haz-mat squads, which soon will be expanded to the Los Angeles region. The system was developed with feedback and close monitoring from the LAFD.

### THE SYSTEM

The system integrates satellite, cellular, and wireless home networking radios (WiFi) along with computers, monitoring stations, software, Voice over Internet Protocol (VOIP), and electronic reference materials. Each of the platforms, plus the electronics and live video systems packages, were integrated into the Los

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Los Angeles City Fire Department Squad 4 at FDIC West in Los Angeles in June 2005.

Angeles City haz mat squads. The platforms include cellular, satellite, and WiFi communications networked with workstations; thermal imaging video; Coastal Environmental WeatherPak MTR; and Industrial Scientific gas, radiological, and nerve agent meters. Real-time information is provided to the user positioned at one or more of the workstations. Data and information are automatically and transparently routed between backend data sources, various communications, hardware, and end-user applications software.

SEE has been in the confined-space arena for more than 11 years. Research and development efforts were begun with the assistance of a \$750,000 Department of Homeland Security Technical Support Working Group (TSWG) grant. In 2003, SEE had a working prototype system capable of handling multiple dissimilar meters and transmitting the data over a redundant wireless backbone. The system originally was developed to meet the safety needs of workers in confined spaces. It uses a robust telemetry protocol and communicates its data by way of the most appropriate radio frequency (RF) band. Digitizing and monitoring the signal make it far less corruptible than cell phones or many current police/fire radio systems. SEE's HazOps® technology allows the system to network with other systems such as hazardous materials, emergency management, and police and fire computers for even

longer-range involvement by other agencies during critical events.

### EVOLUTION OF LAFD SQUADS

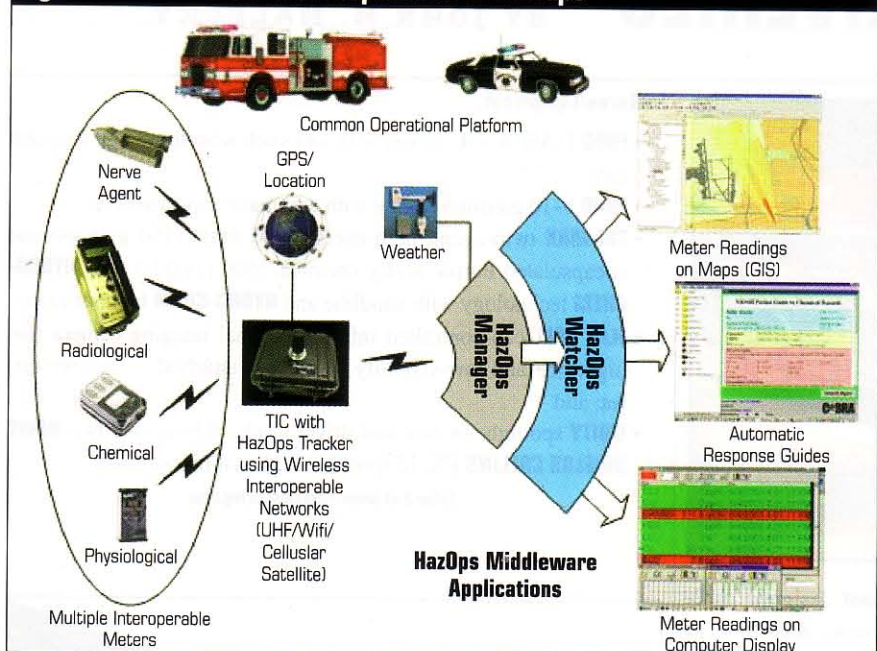
The quantum leap in technology for the LAFD began in the late 1970s with in-house instruction by firefighters with a chemical background. According to Captain Neal Jones, "Apparatus and equipment were added in the early 1980s. They were used until 1991, when Seagrave haz-mat squads were purchased. When federal grant funds became available in recent years, the LAFD decided to use them to purchase new equipment."

The new squads are manufactured by Pierce Manufacturing; SEE supplied the new computer equipment and technology to fuse everything together. The LAFD has four hazardous-materials task forces, which include a five-member truck company; a two-piece, five-member engine company; and a four-member haz-mat squad company. All 14-member task forces have California state haz-mat tech training and respond to all types of emergency incidents.

The old system in the old squad consisted of many written references with a laptop and PC without Internet access. "The new system will allow the haz-mat teams to identify chemicals with updated software and by using the Internet through a cell or satellite linkup," explains LAFD's Jones. "The safety factor is increased by a huge margin with the wireless linkup to the team's meters, which are all monitored by the members in the command area. The overall advantages will bring haz-mat operations to a safer and more effective level," he adds.

The first squad was ready for display at the Fire Department Instructors Conference (FDIC) West in Los Angeles in early June 2005. The demonstrations using the new Draeger 7000 gas meter prompted visiting firefighters and haz-mat team members to praise and comment on the state-of-the-art new squad. The present system was developed to integrate legacy systems and meters, which is very im-

Figure 1. The Three Subcomponents of HazOps®



The three subcomponents: **Watcher**, which provides a data visualization and software interface capability; **Tracker**, which operates remotely to standardize sensor and detector input into a common XML language; and **Manager**, which provides the radio agnostic communications and database management.

portant for budgets. The state-of-the-art system on display in Los Angeles included the following list of supported instruments:

- Ludlum, 2241 Bluetooth and Serial;
- Industrial Scientific, iTX Bluetooth and Serial;
- Industrial Scientific, TMX-412 Bluetooth and Serial;
- Industrial Scientific, VX500 Bluetooth and Serial;
- Proengin, AP2C Bluetooth and Serial;
- Thermo, FH40G Bluetooth and Serial;
- Quest Temp, QTIII Bluetooth and Serial;
- Trimble GPS Serial Only;
- Point Research, DRMIII Bluetooth and Serial; and
- Draeger, X-am 7000 Bluetooth.

“This will definitely save lives. Usually, the worst-informed person on the scene is the man in the field,” notes LAFD Captain Jamie Lesinski. “With this type of two-way communication and meter alerts, we can get up-to-the-minute information to the guy out there.”

SEE is now working on integrating physiological monitoring and location of personnel in global positioning system (GPS)-denied environments. “With the tracking and locating technology we are currently developing, we can locate firefighters in a pile of rubble to within three feet of exact location,” says Lamensdorf. “I have done a lot of research into this problem, and this is by far the best technology I have seen.”

The new physiological monitor provides heart rate and temperature and sits in a small wristwatch. Plans for pilot programs across the nation using HazOps® are in progress for 2006.

Lamensdorf believes pricing for the system should be such that it can be used by small rural fire and police departments as well as in well-funded urban areas. “To me, it’s important that we have a common operational picture, if you will—of the event,” Lamensdorf explains. “Since we provide reach-back capability besides technical reference information at the touch of a button, I know that this system solves the problems first responders face in crisis management.”

SEE recently became a member of the Emergency Interoperability Consortium ([www.eic.org](http://www.eic.org)) and COMCARE ([www.comcare.org](http://www.comcare.org)). Both organizations are working on determining interoperability standards. With that in mind, SEE is incorporating all new interoperability requirements as they are developed. “With LAFD Haz Mat, we were able to solve, by trial and error, the problems that come with the integration of dissimilar products and systems. We are past the learning curve and want to provide other departments the lessons learned,” says Lamensdorf.

A new version of the HazOps® system, which will be released in Spring 2006, will use a PDA and/or a Smartphone for portability. ■