



LIFELINES

A SYSTEM FOR MONITORING WORKERS IN CONFINED SPACES IS NOW PROTECTING PUBLIC CROWDS



Let's say you're at a professional ball game or attending a large charity event, maybe watching history-in-the-making at a presidential inauguration. Around the perimeter of the event, security guards stand at attention, visibly alert for threats to the crowd. What you don't see, however, is the unobtrusive system that's helping the guards do their best possible work. While you're enjoying yourself, Safe Environment Engineering's (SEE) Life•line technology is communicating potential dangers in real-time, empowering

responders to spring into action at a moment's notice.

The technology now being used to protect large crowds had a surprising start. In the early 1990s, California-based SEE developed a confined-space monitoring system designed to help companies comply with Occupational Safety and Health Administration (OSHA) requirements that personnel working in close environments (like storage tanks and vaults) be monitored by a nearby attendant. SEE worked with OSHA to develop an electronic device they called Life•line. The

system allowed an attendant to remotely monitor multiple individuals even while providing alerts, two-way voice communication, and emergency-services dispatch. Companies who signed up for the technology included McDonnell Douglas, General Dynamics, Boeing, and Northrop Grumman. Through Life•line, they enhanced worker safety and reduced costs.

In 2005, the Air Force recognized the technology's potential value to maintenance personnel and others, and awarded SEE a Small Business Innovation Research (SBIR) contract to advance the system. Under the SBIR, SEE added multiple environmental sensors to allow monitoring for chemical, biological, radiological, nuclear, and explosives (CBRNE) dangers, and created a customized wireless platform to convert all incoming data streams into a standardized Extensible Markup Language (XML) format. XML encapsulates, transports, and translates data into a form readable by humans and machines. As SEE further adapted the original SBIR technology for military and public safety applications, they needed to be able to transmit data over the public cellular network and internet. Today, the Life•line platform integrates a wireless transponder on a custom-built secure Wi-Fi network, creating an actionable stream of data within the device. This transponder can be a portable unit for first responders, a mobile system built into vehicles for law enforcement and the military, or a fixed system on buildings for commercial and public safety uses.

Scaled up Life•line systems have helped the Environmental Protection Agency monitor conditions following natural disasters like Superstorm Sandy and Hurricane Irma, and have

been deployed by state and local agencies in big public events like the Boston Marathon, Long Beach Grand Prix, and several presidential inaugurations. Life•line has also been used by the Navy at the Pearl Harbor Naval Shipyard, by the Air Force at Tinker Air Force Base, and by the Air National Guard.

Los Angeles Fire Department Chief and LA Regional CBRNE/WMD (Chemical, Biological, Radiological, Nuclear, Explosive/Weapons of Mass Destruction) Coordinator J. Lesinski oversaw Life•line's use at the 2016 Academy Awards. "Once we have situational awareness [through Life•line], we can provide the appropriate protective actions for

emergency management," Lesinski said. "Our goal is to limit loss, to reduce the threat through early detection, share the information with decision makers, and provide safety for first responders and the public."

According to SEE President David Lamensdorf, the Air Force SBIR was critical in bringing this valuable technology into the public safety sphere. "The SBIR helped us transition our products from a lower bandwidth telemetry system to a fully networked architecture," Lamensdorf said. "This paradigm shift expanded our coverage footprint from an in-building solution to a regional/global systems provider, greatly expanding our

markets beyond confined space to now include homeland security, public safety, and defense."

Impressed with the Life•line system, the Department of Homeland Security (DHS) funded a pilot project in 2010 called ICBRNE (Integrated CBRNE). The idea was to create a response policy and Common Operational Picture to view simultaneous environmental data and improve

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A firefighter views a remote data stream on a hot-zone meter. Previous page, Life•line provides live readings to Hazmat team members.



The Los Angeles County Emergency Operations Center uses Life•line technology provided by SEE.

situational awareness. During a two-day practice event, Los Angeles County, DHS, and SEE simulated a nuclear explosion over downtown LA. The first day was spent monitoring communications between agencies. Life•line's servers were flooded with massive amounts of data, but the system easily handled the load, using only 5 percent of its capacity. The second day focused on the content of the data transmitted and how agencies would act on the information. Results showed that Life•line would enable the city to respond more effectively and save lives in the process. The Federal Emergency Manage-



ment Agency created a case study around the ICBRNE project, which is currently being used in Homeland Security graduate programs.

SEE is now creating a new generation Life•line device that will be simpler to use and easier to configure. The device will help the company and its SBIR-supported technology become fully integrated into the cutting-edge internet of things—a network of physical devices able to exchange data—boosting the capacity and welfare of military personnel and first responders, and making the world a safer place for us all. 🌟

Safe Environment Engineering

Modernization Priority: Networked Command, Control, and Communications (C3)

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