Photo courtesy of PyroLance

R-TECH™ NEWSLETTER
The Newsletter of the First Responder Technologies Program

Volume 2 • Issue 3 • March 2009

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IN THIS ISSUE

FORENSIC ANALYSIS ON THE GO

Deployable Forensics Lab Makes Crime-Related Investigations Mobile

Information and evidence gathered at a crime scene must often be analyzed as quickly as possible. If first responders can obtain crime scene data in real time, they can better determine if additional, more detailed tests are required before they leave the field. However, a lab for preliminary analysis is not always nearby or readily available. The National Forensic Science Technology Center (NFSTC) is developing a deployable forensic lab to address these needs.

The portable forensic lab measures 8 feet high, 20 feet wide, and 8 ½ feet deep. Deployable within a half-hour of arrival, it folds up to fit in a 20-foot long shipping container that can be carried by train, helicopter, or trailer. "As long as you have diesel fuel to power a generator, it can be deployed to almost anywhere," said NFSTC Chief Executive Officer Kevin Lotheridge.

The deployable lab, which is currently in the prototype stage, would enable the collection of forensic evidence and data in real time, with capabilities to rival those of typical stationary labs. According to Lotheridge, it can perform forensic screening functions as complex as DNA analysis.

Originally designed to advance wartime forensic technology capability, development of the deployable lab was funded through the Defense Threat Reduction Agency, a division of the Department of Defense. In fact, one of the labs is currently being used by U.S. troops in Iraq.

A key advantage of the portable lab is that it can be used as a temporary replacement lab in the event of an emergency. Such was the case when a lab was deployed to Cedar Rapids, Iowa after floodwaters swamped the city's police forensic unit in June 2008. "We lost 80 percent of our evidence section and recovered property area," said Chief Greg Graham of the Cedar Rapids Police Department (CRPD). Soon after the flooding, the department contacted NFSTC to assess the situation. "The response in setting it up was fairly seamless," said Graham. "Six weeks later they sent the lab."

Graham also said that while the lab will not be a permanent fixture within CRPD, it is an invaluable resource while a permanent lab is being rebuilt. "We would not have had an evidence lab at all because of the flood damage." CRPD's deployable lab currently houses three CRPD crime scene

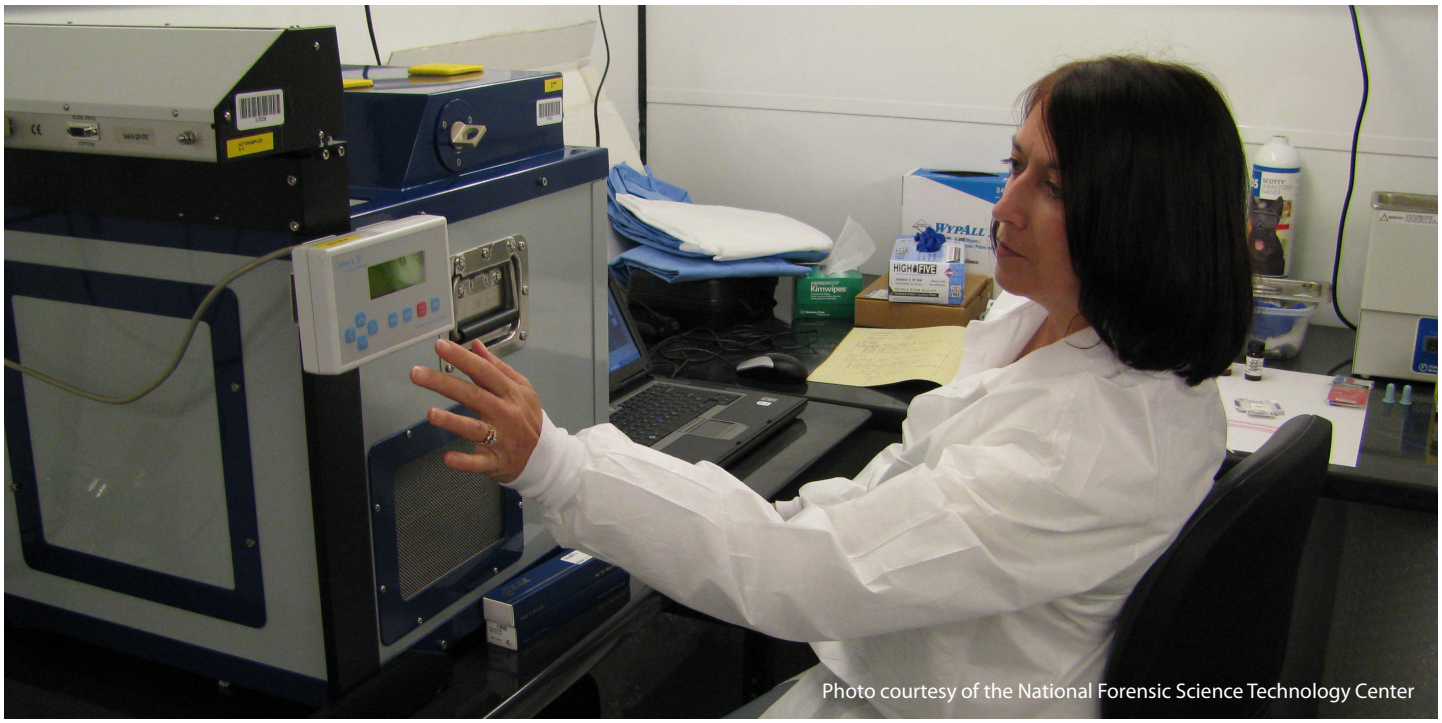


Photo courtesy of the National Forensic Science Technology Center

Forensics Analysis on the Go (continued)

technicians and has room for a fourth. The lab handles activities that the old, flooded lab would normally perform. "They're doing drug testing, fingerprint fumigation, and DNA testing," Graham said. "The DNA testing has even helped with a few burglary hits."

Graham reported that temperatures in his area can reach below zero in the winter. In response, NFSTC is conducting tests to examine the lab's durability in extreme weather conditions. "We're finding out about cold temperatures and where it can't work," said Lotheridge. "We didn't expect for it to have to be used in -22 degrees."

Deployable labs, like the one in Iowa, are designed to make forensic analyses quicker, rather than conduct in-depth research in specific areas of forensics. "It's about timely, necessary things, not specialty service," Lotheridge said. He also believes the lab represents the start of innovation in forensics. "It will drive manufactures to make smaller, more robust technologies for non-technicians to use," he said.

For more information, including additional photos of the lab, visit www.nfstc.org/programs/deployable%20lab/deploy%20lab.htm.

Photo courtesy of the National Forensic Science Technology Center

ON THE DEFENSIVE

Wall-Penetrating Aggregate Cools Fires Quickly

Photo courtesy of PyroLance

Fire fighters must sometimes risk their lives by entering burning structures to control and extinguish fires. A new high-pressure cooling system derived from a system created in Europe may soon help fire fighters in the United States attack structural fires from safer distances.

This cooling system has the same name as its Colorado-based developer, PyroLance. The *PyroLance* consists of a water supply, granite/sand aggregate, high pressure pump unit, hose, and hand-held lance.

While remaining safely outside a burning structure, fire fighters can use the *PyroLance* to cut a pea-size hole into an exterior wall with a high-pressure stream of water and aggregate. With a pressure rate of 4000 psi, the *PyroLance* can cut through one-inch thick concrete walls and double-layer brick within seconds, and it can pierce through rebar in collapsed structures. Once the structure is penetrated, the operator sprays an ultra-high pressure mist of water into the thermal layer of the fire inside the structure, generating a fog stream that drops the temperature from 1500° F down to 200° F in a matter of seconds.

On the Defensive (continued)

"We realized that a fire is really the smoke and the combustible gases," said Cas Seyffert, retired district fire chief and director of operations at PyroLance. "If we could put coolant on the gases, we'd be taking the guts out of the fire."

David Trevvett, project officer for robotic firefighting technologies in the Air Force Research Laboratory (AFRL) at the Tyndall Air Force Base in Florida, has assisted testing of the *PyroLance*. "With the *PyroLance*, operators are able to attack the fire from outside the building by injecting [the] agent through an exterior surface and into the thermal building without introducing oxygen into the mix," said Trevvett. "This cools the unburned vapors below flash point, allowing firefighters to quickly enter the facility for extinguishment and rescue activities without danger of explosion."

The efficiency of the water and the abrasive aggregate in eliminating the fire increases with the fire's intensity. "The hotter the environment it's in, the better it works," said Seyffert. He also said that the product cuts down on manpower because it requires less water. The system dispenses water at a rate of 15 gallons per second, far less than a standard fire hose.

The *PyroLance* technology is scheduled for release by the summer of 2009.

PyroLance is also working with the AFRL to research a new application of the system. AFRL is examining the most efficient ways to extinguish fires in aircraft manufactured with composite materials, which contain aluminum, tin, and other elements. PyroLance will participate in testing the penetration ability of its product on the aircraft, said Scott Alexander, a PyroLance executive.

First responders other than fire fighters may find the system useful in their disciplines. For example, port and vessel security can use the *PyroLance* to keep ports safer. Trevvett said, "At one point or another just about everything we come into contact today has traveled by intermodal container whether by truck, rail or ship. When utilizing piercing technology, you can attack the fire and cool [it] below 212 [degrees Fahrenheit] without ever physically opening the container."

Alexander noted that PyroLance is conducting other research to improve the device. For example, a robotic platform is being researched that would allow responders to use the *PyroLance* to put out fires from even greater distances.

For more information on the *PyroLance*, visit www.pyrolance.com.


Photo courtesy of PyroLance


Photo courtesy of PyroLance


Photo courtesy of PyroLance

STAYING CONNECTED

Emergency Telecommunications System Gives First Responders Priority Access

Photo courtesy of FEMA Photo Library

Telecommunications outages can be a nuisance for consumers. For first responders, they can cause delays in emergency efforts and ultimately lead to the loss of property or life. Whether the failure is the result of physical damage, power outages, or system overloads, the result is always the same: emergency personnel cannot communicate.

To address this capability need, the National Communications System (NCS) of the Department of Homeland Security Office of Cyber Security and Communications provides three programs: the Government Emergency Telecommunications Service (GETS), the Wireless Priority Service (WPS), and the Telecommunications Service Priority (TSP).

Established in 1994, the GETS program gives users access and priority processing to the Public Switched Telephone Network (PSTN) when the PSTN is congested or disrupted during an emergency and emergency responders cannot complete their calls through normal means.

The WPS program was established after the September 11, 2001 attacks to provide similar emergency access and priority processing for emergency responders who are unable to complete their calls through the cellular network.

In addition to the two calling services, NCS offers TSP. Through this program, registered users are given priority for service requests to registered critical circuits, enabling critical communications channels to be repaired first in the event of a communications outage.

Those who perform critical national security and emergency preparedness (NS/EP) functions are eligible to sign up for these services. The opportunity is open to federal, tribal, state, and local governments, critical infrastructure sectors in industry, and non-profit organizations in NS/EP.

The three programs are facilitated through a partnership between the federal government and major telecommunications carriers. Calls placed through GETS or WPS roll over from carrier to carrier until an open line is found, a process that is invisible to the user. In the event that the telephone infrastructure is damaged or destroyed, as was the case during Hurricane Katrina, carriers set up mobile communication units to establish temporary service.

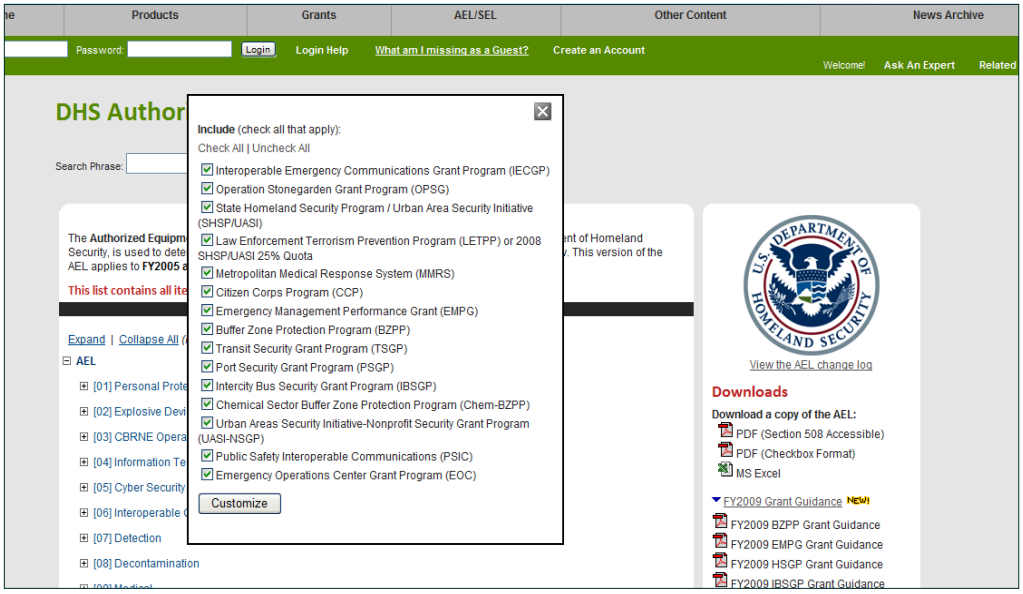
To date, over 210,000 first responders are registered for GETS and nearly 100,000 for WPS. Other eligible users may register for these services by logging onto http://gets.ncs.gov and clicking on the "First Time Requestor" link. Once a registration request is processed and approved, the user will be issued a card with access information. To use the system, the user dials a universal access number and enters his or her personal identification number (PIN). Users are charged for GETS calls at the rate of $0.07 to $0.10 per minute. Rates for WPS service vary by carrier.

For more information about these programs, visit http://gets.ncs.gov, http://wps.ncs.gov, and http://tsp.ncs.gov.

THE RESPONDER KNOWLEDGE BASE

Finding Grants on the RKB

One of the most visited sections of the Responder Knowledge Base (RKB) Website is the Grants and Assistance Programs module. This module currently contains more than 200 individual grant records related to emergency response and is divided into two sections: Current Grants and Archived Grants.



The Current Grants section includes the most recent U.S. Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA) grants from the Grant Programs Directorate (GPD), grants from other federal agencies, and even some grants from commercial sources. The Archived Grants tab serves as a historical record for FEMA GPD grants from past years.

RKB users have different options for viewing current or archived grants or assistance programs. For example, a user can access a list of open grants, or grants from any given year, by conducting a simple keyword search by fiscal year such as "FY2009."

To view a list of open grants from just FEMA GPD, users can visit the Authorized Equipment List (AEL). Produced and maintained by FEMA GPD, the AEL is a generic list of equipment items allowable under DHS grant programs, including the Homeland Security Grant Program. Also available on the RKB site is the Standardized Equipment List (SEL), which is published by the InterAgency Board for Equipment Standardization and Interoperability to provide first responders with a recommended list of generic equipment items.

To access the AEL, click on the AEL/SEL tab on the RKB homepage. Once in the module, click on "AEL Only." A list of current FEMA GPD grants will be viewable on the right-hand side of the screen in the "Downloads" box. Other information will include links to the previous year's grants and the latest information bulletins from DHS. Users can also click on the "Click Here to Customize by Grant" function on the DHS AEL page to sort for equipment types applicable to select FEMA GPD grants.

If you have any difficulty navigating the grants sections of RKB, please contact the RKB help desk at RKBMailbox@us.saic.com or 1-877-FEMA-RKB (1-877-336-2752). Registered users can also enter online questions through the Ask an Expert module.

Please note that RKB itself does not oversee or provide funding for the grants but instead functions as an information repository that provides links to the appropriate grant sources. For more information, visit www.rkb.us. For questions or suggestions, e-mail info@rkb.us or call (703) 641-2078.