HOMELAND SECURITY

Restoration Capabilities

Speeding recovery after a terrorist attack

Context

Counterterrorism rightly emphasizes prevention. But should an attack occur, it is crucial to respond quickly and effectively to minimize casualties and return to normal operation as soon as possible, thereby limiting the economic and emotional fallout.

Solution

Building on decades of experience in securing the nation's nuclear stockpile, Sandia National Laboratories has pioneered incident response strategies for all major terrorist threats—chemical, biological, radiological, nuclear, and explosive—and for different types of facilities.

The lab's restoration research addresses the full spectrum of incident response: determining the type and extent of contamination or other damage; rendering the site safe enough to evacuate victims and treat casualties; and restoring facilities and functions without losing expensive equipment or critical services.

Success in the laboratory is one thing; success in real-world operations during a crisis is quite another. Sandia brings its characteristic "systems approach" to incident response, examining the interplay among attack modes, facility defenses (physical and procedural), personnel training and organizational coordination (both within and among institutions), and technology cost, maintenance, and usability. Through expert contingency analysis, researchers ensure that response systems will actually work during an emergency.

Benefits

Sandia's seasoned analysts anticipate data and policy gaps, and devise plans to integrate institutional capabilities, thereby minimizing chaos during a crisis. The result is a more seamless and effective response that curtails incident impact.

A notable example is BROOM, a system developed by Sandia and Lawrence Livermore National Laboratories in close cooperation with San Francisco Bay Area airports. BROOM is a software-based tool that will help airports and other high-traffic public buildings preplan for possible restoration and decontamination after an event. It makes use of handheld PDAs that contain building maps and other tools to simplify sample collection in a contaminated area and ensure proper tracking of information about each sample. This precise tracking system also makes it easier to determine if a building is safe for re-entry after decontamination.

By helping at all stages—from preplanning to sample collection and management—BROOM can greatly reduce the time needed to restore a facility after the release of a biological weapon.

An exercise to test BROOM with the National Institute for Occupational Safety and Health (NIOSH) was a tremendous success. NIOSH crews were very impressed with the product and plan to further evaluate it in future sampling operations.

A Sampling of Sandia Restoration Capabilities

Decontamination foam. Sandia has developed a decontamination formulation with low toxity and corrosivity properties that rapidly neutralizes both chemical and biological threats. Available as a foam, spray, or fog, it is affordable enough that canisters similar to fire extinguishers could become standard issue for police and fire departments. An early version of the formulation was used to neutralize anthrax in portions of the Congressional office buildings, and the U.S. Military staged it in the Middle East for potential use in Operation Iraqi Freedom. It can also be used to clean up hazardous freeway spills and industrial accidents or as a sterilizing agent in the medical and food processing industries.

Radiologic decontamination. Sandia has developed a substance that can be sprayed on radioactive surfaces (e.g., walls) to

SAND No. 2005-5756P
September/2005

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Foam developed by Sandia and now licensed to two commercial vendors was used to remediate portions of the Capitol Hill office buildings and news facilities in New York City.

contain and capture radioactive material. The coating can then be peeled off and disposed of.

Bomb disabler that preserves forensic evidence. The Percussion-Actuated Non-electric (PAN®) disrupter renders a bomb safe without detonation, thereby preserving the bomb for forensic analysis. A favorite of bomb squads nationwide, PAN was used to disable a device found at the Unabomber cabin and the shoe bombs removed from trans-Atlantic airline passenger Richard Reid.

Robots as first responders. To avoid putting humans in harm's way, Sandia has developed software and sensor technology (Sandia Modular Architecture for Robotics and Tele-operation, or SMART) that allows police to more effectively control robots used in removing explosives and other hazards.

Expert emergency response personnel. In the days immediately following 9/11, Sandia experts were called to Ground Zero to provide on-site design, development, and implementation of radio frequency video and audio capabilities for K-9 search and rescue dogs. These devices allowed the animals to search areas impassable by humans, while transmitting live images back to handlers and other search team members.

Integrated detection/response systems. Sandia's PROACT program for airports and PROTECT program for subways are designed to detect chemical and biological attacks and provide situation-specific recommendations for safe evacuation and decontamination.

Status

Concerned with putting technologies into the hands of the people who need them, Sandia has worked with partners to deploy systems or to commercialize products. For more on the status of a particular technology, please refer to the website or the contact below.

For more information contact

Mike Janes at 925.294.2447
mejanes@sandia.gov

Learn more at
http://homelandsecurity.sandia.gov