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Sandia adds radiation detection scenario to 2013 Urban Shield Exercise

A nuclear device has been detonated in the Midwestern United States and intelligence indicates that a second device is coming into the San Francisco Bay Area. Federal assets, due to the urgency and lack of specific intelligence on the adversaries' transport route, cannot deploy adequate resources quickly enough. As a result, S.W.A.T. teams are requested to set up checkpoints throughout the Bay Area to covertly detect and interdict the threat, but how successful will they be in such an unusual, high-consequence scenario, using equipment they may never have trained on?

In late October, a Sandia team from Center 8100, Homeland Security and Defense Systems, put 34 S.W.A.T. teams through this very scenario as part of the Alameda County Sheriff's Office (ACSO) 2013 Urban Shield Exercise. Now in its seventh year, Urban Shield is the largest full-scale training exercise in the nation, bringing together over 150 local, state, and federal agencies.

Over a 48-hour period, the S.W.A.T. teams participated in 32 tactical scenarios. Other first responders such as fire, Urban Search and Rescue (USAR), and hazmat teams participated in scenarios simulating hazardous materials, improvised explosive devices (IEDs), active shooter, natural disasters, and search and rescue incidents.

Sandia's involvement in Urban Shield came about after Donna O'Connell (8118), Stacy Mui (8112), and Andrew Cox (8116) engaged law enforcement officials from ACSO and Washington State in developing case studies to characterize preventative radiological and nuclear (R/N) capabilities. "We wanted to do something for regional law enforcement agencies in return for the time they gave us in interviews to develop the case studies," explains Donna. "We offered them an R/N awareness briefing by Gary Richter (8116) and assistance in developing an R/N scenario for Urban Shield."

With funding from the DHS Domestic Nuclear Detection Office (DNDO), Sandia's role evolved from just developing the scenario to executing it as well. Donna and Stacy, along with Troy DeLano (8137) and Ann Hammer (8112), designed and ran the scenario. Numerous other Sandians and partners from LLNL and DNDO contributed to execution of the scenario.

DNDO is the primary entity in the U.S. government for implementing domestic nuclear detection efforts for a managed and coordinated response to radiological and nuclear threats, as well as integration of federal nuclear forensics programs. Additionally, DNDO is charged with coordinating the development of the global nuclear detection and reporting architecture, with partners from federal, state, local, and international governments and the private sector.

Active radiation source adds realism

Early on, the team decided the scenario would include an active radiation source and personal radiation detectors. "Using an active radiation source instead of a simulated source required a tremendous, coordinated effort," says Stacy. "This was the first Division 8000 work level project to undergo the new engineered safety process. We wanted a successful exercise – successful not just in terms of execution, but also in safety and security."

The R/N detection scenario took place in a large airplane hangar at the Oakland Airport. The team set up a simulated checkpoint with eight vehicles, including a panel van housing the radiation

source in a mockup of a nuclear weapon and immediately behind it in line a U-Haul truck that was not involved in the simulated nuclear weapon transport.

The S.W.A.T. teams had to locate the radiation source using personal radiation detectors as covertly as possible and contain the scene, which included a distraction from several cars behind the U-Haul truck. The S.W.A.T. teams did not know how many devices they were looking for or how many people were involved.

Each S.W.A.T. team underwent a pre-briefing on what they would encounter in the scenario, training on specialized equipment, and a de-brief following the scenario. Tom Seif, Illinois Emergency Management Agency, and Jeff Oakley, Illinois Law Enforcement Alarm System Special Response Team, provided training on the personal radiation detector. This was especially effective, says Ann, because the S.W.A.T. teams learned directly from other law enforcement personnel.

The presence of a real radiation source brought the scenario much closer to real life and gave the S.W.A.T. a rare opportunity to conduct tactical operations in that environment. "We batted around the question of it was worth the effort and safety concerns, but ultimately this was the biggest benefit to our scenario," says Ann.

That benefit extended beyond the S.W.A.T. teams to the volunteers who helped put on Urban Shield. "Some of the volunteers were Police Academy cadets or recent graduates. Others were people just interested in helping. So this was a unique training opportunity to educate the general public on radiation hazards and detection," says Stacy.

The Sandia team ran the scenario 34 times over the 48-hour period. They found that each time the scenario evolved, it was different. "I was deeply impressed with how capable, adaptable, and effective the S.W.A.T. teams are in doing their job," says Troy. "I thought we'd see patterns emerge, but something different happened each time."

For the Sandia team, it was an opportune time to work directly with first responders. "We tend to do a lot of analysis in the intersection of science, technology, policy, and operations, but most of us do not have operational backgrounds," says Stacy. "It's critical to engage with operational stakeholders when designing products and solutions for them."

If funding is available, Sandia may work with ACSO on developing another R/N training exercise, possibly as part of next year's Urban Shield.

"The success of our involvement with Urban Shield could open a lot of doors," says Donna. "I think there could be opportunities for other groups at Sandia, bioterrorism or the Reachback Center perhaps, to become involved in this kind of exercise in the future."

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