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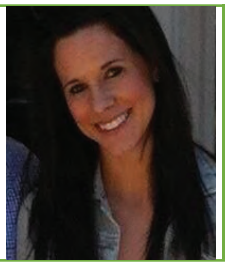
Radiological Risks Demand Greater Focus and Scrutiny



Amid the recent wave of devastating terrorist attacks from Orlando to Istanbul to Nice, the potential for a radiological attack on American soil has received little attention. While gun violence dominates headlines, the increasing number of terrorist attacks has failed to spark substantial discussion on how to combat unconventional attack methods.

Particularly troublesome is the lack of focus on the security of radiological materials used every day in thousands of hospitals nationwide. In the hands of a terrorist or other bad actor, these sources have the potential to be used as deadly weapons, including dirty bombs.

The US Nuclear Regulatory Commission defines a dirty bomb as a "type of radiological dispersal device (RDD) that combines conventional explosives, such as dynamite, with radioactive material." Although most do not produce enough radiation to kill many people, an RDD explosion could engender a number of prolonged and unpredictable consequences, including mass hysteria, significant health risks – both physical and psychological – due to radiation exposure, property damage and economic repercussions, such as major cleanup costs.

The threat of a dirty bomb attack is real, and it could be imminent. Reports that terrorist organizations are seeking radiological material have put governments around the world on edge. In October 2015, the Associated Press reported that the FBI and Eastern European authorities successfully foiled several attempts by criminal gangs with suspected Russian ties to sell radioactive material to terrorist groups.

Commenting on the incident at an October 2015 House Subcommittee on Coast Guard and Maritime Transportation hearing, Chairman Duncan Hunter (R-Calif.) said, "The successful disruption of the sale was a positive result. However, the desire of our adversaries to obtain, at a minimum, materials for a dirty bomb, or even materials for a nuclear weapon are growing."

Then, in November 2015, Reuters reported that highly dangerous radioactive material "stored in a protective case the size of a laptop computer went missing from a storage facility belonging to US oilfield services company Weatherford," located near the southern Iraqi city of Basra.

The International Atomic Energy Agency (IAEA) classified the missing material as Category 2, which means the material could cause permanent injury or even death in a person who comes in contact with it. Moreover, there have been 2,889 reported incidents of illicit trafficking or unauthorized activities involving nuclear and other radiological materials between 1993 and December 31, 2015, according to the IAEA Incident and Trafficking Database.

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Reuters subsequently reported that the material was later discovered near a gas station in the southern town of Zubair. However, the incident has stoked fears over the possibility of radiological material falling into the hands of malicious actors, particularly terrorist groups like the Islamic State of Iraq and Syria (ISIS), which could use the material to launch a devastating dirty bomb attack.

US intelligence officials and lawmakers believe it is only a matter of time before a terrorist organization attempts to use chemical, biological, radiological or nuclear weapons.

Alarmingly, malicious actors do not need to go abroad to access the radiological material necessary to develop a dirty bomb. There is widespread availability of highly dangerous isotopes, including cesium-137 and cobalt-60, in the United States, and most of the sources of these materials are not secure.

One of the focal points of the Nuclear Security Summit in Washington, DC, in March was keeping radiological materials out of the hands of terrorist groups such as ISIS. The material necessary to build a dirty bomb can be found everywhere.

Radiological Recipe

In March, the Nuclear Threat Initiative released a report that stated, "The ingredients for a radioactive dirty bomb are in tens of thousands of radiological sources located in more than 100 countries around the world. They are used in medicine and science at hospitals, universities and research centers. They are used in agriculture, in industry and by governments for various purposes. And in all these settings, they are too often poorly secured and vulnerable to theft and sale on the black market."

Scott Masiella, product line manager for spectroscopy at Thermo Fisher Scientific, told *Homeland Security Today* that acquiring the material necessary to create a dirty bomb would be a cakewalk to pull off at many hospitals and medical facilities.

Radiological material is used throughout the world for medical and industrial purposes. It plays a vital role in the treatment of patients inside a hospital, but the effects of radiological material ending up in the hands of terrorists could be devastating.

Cesium-137, for example, is used for a number of medical applications, including in blood irradiators. The 2014 US Government Ac-

countability Office (GAO) report *Nuclear Nonproliferation: Additional Actions Needed to Increase the Security of U.S. Radiological Sources* spotlighted serious security vulnerabilities in hospitals where sources like cesium were not properly secured.

In one case, GAO "observed a cesium-137 irradiator with approximately 800 curies that was on wheels and in close proximity to a loading dock rollup door that was secured with a simple padlock." While stored in a vault with a reinforced door and motion detector, the vault door was left open.

Hospital Security

Masiella said it is crucial that hospitals implement technology, such as fixed portable monitors at exit and entry points to alert security and help prevent high-risk radioactive material from being removed.

"Nuclear power facilities have tremendous security, even before you get anywhere close to the plant," Masiella explained. "Hospitals, on the other hand, while they do have some security, also contain very big sources that are much easier to get too."

To be the most effective, these detectors must be capable of not only determining that radiological material is present, but also *what* material it is. Masiella said the importance of being able to identify the type of radiological material was highlighted during a recent major sporting event that put Thermo Fisher Scientific's radiation detection technology to the test.

A day before the event, one of the instruments received a cesium alarm. It ended up being from an underground gauging tool with a radioactive instrument, which is a typical use for cesium-137. The detector not only showed that cesium-137 was present, but also provided information on potential uses for cesium-137.

"With a normal tool, they probably would have dismissed the alert, thinking it was from a medical patient or a granite building nearby. They likely would not have investigated further," Masiella said. "Most of those officers had no idea cesium would be used in those gauging instruments. So one of the things we have taken away from that is developing a toolset – kind of like a Wikipedia."

US Marines from 3rd Marine Division, Chemical, Biological, Radiological and Nuclear defense platoon, Headquarters Battalion, III Marine Expeditionary Force, evacuate simulated casualties during exercise Habu Sentinel 16 at Disaster Village, Marine Corps Air Station, Iwakuni, Japan.

Photo by Sgt. Jessica Quezada

Masiella added that security personnel and first responders typically don't have extensive radiation training, so the tools must be smart. "I always tell my engineering team, 'You need to put yourself in the instrument.' Technology shouldn't just spit out a reading, it should tell us what that reading means."

This example easily translates to the hospital setting. With a standard radiation detector that only indicates whether there is radiation present, the user has no idea whether that person walking out of the hospital simply has a medical treatment or radiological material they are not supposed to have.

Overall, radiation detectors need to become standard protocol in places where radiological material can be easily accessed. Unfortunately, because there has yet to be a major radiological attack, securing radiological sources and preventing a dirty bomb attack simply aren't high on the list of priorities.

Masiella noted that radiological threats tend to only receive attention when preparing for high-profile, large-scale events, such as the Super Bowl, the Democratic and Republican Conventions, or the pope coming to town. But it is in ordinary, everyday life that radiation detection is truly needed.

"If you look at recent events, they are not really happening at highly publicized events. "We do a nice job at large event support, but for the day-to-day stuff, more needs to be done, and I think we have the tools to do it." HST

Amanda Vicinanzo, Online Managing Editor *is a regular contributor to the print magazine. She earned her master's in Statecraft and National Security Affairs from the Institute of World Politics in Washington, DC. While pursuing her graduate degree, she completed an internship with the National Journalism Center, coordinating the annual Veterans Day conference and working on* The American Valor Quarterly.