Nuclear terrorism in South Asia

BY ROSHAN KHANIJO

Roshan Khanijo, PhD, is a senior research fellow and research coordinator with the Centre for Strategic Studies and Simulation (CS3) at the United Service Institution of India (USI), New Delhi.

According to the 2005 United Nations International Convention for the Suppression of Acts of Nuclear Terrorism, the offence of nuclear terrorism is committed if a person "unlawfully and intentionally ... [u]ses in any way radioactive material ... [w]ith the intent to cause death or serious bodily injury; or [w]ith the intent to cause substantial damage to property or to the environment; or [w]ith the intent to compel a natural or legal person, an international organization or a State to do or refrain from doing an act" (United Nations, 2005, art. 2). The major vulnerabilities facing nuclear power states arise from a number of potential sources, including the theft of nuclear material to make an explosive nuclear device, the theft of radioactive material to make a "dirty bomb," cyberattacks launched to acquire access to and to subsequently damage nuclear plant safety, and the sabotage of nuclear facilities and transport and transit routes. Nuclear weapon states are also vulnerable to cases of theft or accidental use of low-yield nuclear weapons.

THREATS FROM TERRORIST GROUPS

Globally, nuclear power plants are operational in 30 countries, while 50 countries use nuclear energy in about 225 research reactors, and nuclear energy now provides about 11 percent of the world's electricity from approximately 450 reactors (World Nuclear Association, 2018). The number of countries involved in generating electricity through nuclear power plants has made the threat of nuclear terrorism real and global. This sobering reality looks even grimmer when we consider that there are no uniform standards of nuclear safety and security and that many nations lack transparency in their governance. The threat is more pronounced in South Asia because the Af-Pak region (Afghanistan and Pakistan) is the hub of terror activities. Many prominent groups, such as the Haqqani Network, Hezb-e-Islami Gulbuddin, al-Qa'ida, and Lashkar-e-Tayyiba, are based in the area. South Asia is also the location of two nuclear weapon states, India and Pakistan. The challenge therefore is to maintain a high standard of safety and security for nuclear power plants.

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The International Atomic Energy Agency (IAEA) defines nuclear safety as the achievement of proper operating conditions, the prevention of accidents, and the mitigation of the consequences of accidents, resulting in the protection of workers, the public, and the environment from undue radiation hazards; and it defines nuclear security as the prevention and detection of, and response to, theft, sabotage, unauthorized access, illegal transfer, or other malicious acts involving nuclear material, other radioactive substances, or their associated facilities (IAEA, 2007). The challenges to a nuclear power plant arise from several sources, such as design-based threats, the "insider threat," sabotage, and drone attacks against nuclear power plants and other radioactive and nuclear research facilities. For example, not only can a swarm of drones carrying explosives damage a nuclear plant, but they can also be used to disperse radioactive materials against human populations or critical infrastructure.

DIRTY BOMBS AND CYBERTHREATS

A radioactive dispersal device (RDD), commonly known as a "dirty bomb," is a conventional bomb spiked with radioactive materials. The IAEA estimates that there are up to 1 million radiological sources around the globe (Luongo, 2010, p. 3). All of the countries in South Asia use radioactive elements widely, in settings ranging from scientific laboratories to agriculture and health care. Given their widespread use, radioactive elements need to be monitored and protected from being compromised by terrorist organizations. The damage from a dirty bomb may not be as severe as that from a high-yield nuclear device, but its detonation in a busy market hub, say, would cause mass panic and confusion and would contaminate the area, and regional economies would be impacted while decontamination is undertaken. Therefore, accounting for radiological substances both at the source and at the disposal stage is important. Strong surveillance and monitoring systems are required.

Another concern is that as nuclear power plants are modernized and digitized, they become more prone to cyberthreats. If terrorists destroy or disable a nuclear plant's backup mechanisms and cut off water and power supplies, they could create another Fukushima crisis. Even computers that operate on a closed network may be compromised by various hacking methods,

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such as privilege escalation, roaming notebooks, wireless access points, embedded exploits in software and hardware, and maintenance entry points. Maintaining high standards of safety and security is paramount.

SMALL MODULAR REACTORS AND CANADA

In Canada, nuclear power plants have been producing electricity commercially since the early 1960s. Today, five plants in three provinces house 22 nuclear power reactors, and the total share of electricity generated from nuclear reactors is about 15 percent (Canadian Nuclear Safety Commission, 2016). In June 2017, Canadian Nuclear Laboratories (CNL) put out a call for a discussion around small modular reactors (SMRs) in Canada. In the call, CNL asserted that SMRs are “a potential alternative to large-scale nuclear reactors”; would be effective at “decreasing up-front capital costs through simpler, less complex plants”; and are “inherently safe” designs (Canadian Press, 2017). Considering that small reactors were shut down in the United States when questions were raised regarding their economic viability, we need to reflect on not only the economic issues surrounding SMRs, but also whether it is possible to provide adequate safety and security for SMRs, and the equally important issue of global terrorism. A comprehensive discussion must take place before any policy decisions are made.

A GLOBAL THREAT

The threat of nuclear terrorism is global, but it is more pronounced in South Asia, where there are two nuclear weapon states. It is of the utmost importance that special efforts be made to implement robust nuclear safety and security mechanisms, including constant monitoring and surveillance. Efforts should also begin to abolish tactical nuclear weapons, which threaten not only host nations but all neighbours as well. And in Canada, the advantages and disadvantages of SMRs should be debated before any commercial application is undertaken.

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