Rx FOR SECURITY

Preventing Nuclear Terrorism

NUCLEAR POWER AND THE TERRORIST THREAT

The United States is home to 104 nuclear power reactors licensed by the U.S. Nuclear Regulatory Commission (NRC).[1,2] These nuclear power reactors generate eight percent of the total energy consumed in the U.S.[3] Several nuclear reactors are situated in close proximity to large urban population centers, such as Indian Point Energy Center, located just 22 miles from New York City. Many experts consider U.S. nuclear reactors to be "high-value targets" for a terrorist determined to inflict large-scale death and destruction in the United States. In 1980, the Federal Emergency Management Agency (FEMA) commissioned a report on the security vulnerabilities associated with the energy system. In regard to nuclear power plants, the FEMA report noted,

> Since nuclear power plants constitute less than 200 potential targets . . . and have the added risk in some cases of being very close to population centers, they are prime candidates for strategic nuclear targeting or conventional bombing.[4]

Three Mile Island Nuclear Power Plant: Middletown, Pennsylvania

Unfortunately, FEMA's warnings have continuing relevance today. Since September 11,2001, the FBI, NRC, and other federal and state offices have recounted received numerous threats concerning U.S. nuclear power plants which remain vulnerable to internal sabotage or terrorist attacks. For decades, experts have believed and warned that a well-funded, coordinated terrorist group could be capable of successfully launching a major attack in the future.[7] While limited preventive security measures are being slowly implemented to reduce the likelihood of a successful attack, in the long-term only the complete end of nuclear power coupled with the secure dismantling of nuclear power plants and "disposal" of components and waste can fully prevent such a devastating event.

The Threat

The two most vulnerable parts of nuclear power facilities are nuclear reactors and spent fuel pools. If an airliner crashed into a nuclear reactor's containment structure, the plane could penetrate the structure, likely leading to an explosion and fire. Nuclear power plants are not well equipped to deal with severe fires, which could cause several safety systems to fail simultaneously. The explosion would have the effect of a large dirty bomb resulting in a substantial release of radioactivity.

Terrorists could also target spent fuel pools, which are large pools of water on-site where used nuclear fuel from commercial reactors is stored.

The water absorbs radiation and keeps the fuel from overheating. Many spent fuel pools are aboveground, and are protected by a "steel super-structure," which is actually a corrugated building unlikely to withstand an attack. A plane crash, or even a large truck bomb, could displace or evaporate enough water to leave the rods exposed. The resulting buildup of heat could trigger a large release of radiation. It has been calculated, for instance, that a fire at a spent fuel pool of the Millstone nuclear power plant in Connecticut could result in the release of cesium-137 at doses larger than the estimated release from the Chernobyl accident, which led to 30 acute deaths from radiation sickness, over 1800 excess cases of childhood thyroid cancer, the evacuation of 100,000 people, and the contamination of vast tracts of land.[8]

The release of radioactivity can result in a variety of devastating health and environmental effects. Acute exposure to radiation can cause radiation sickness, the symptoms of which include nausea, weakness, hair loss, skin burns, and loss through death of organ function. Chronic exposure to lower levels of radiation results in genetic mutations that can cause cancer or be passed on to offspring.[9] As indicated by Chernobyl, release of radiation could also render large areas of land uninhabitable for long periods of time.

Ready or Not?

The tragic events of September 11, 2001 generated new concerns about the vulnerability of nuclear power plants to sabotage or terrorist attack. According to International Atomic Energy Agency (IAEA) spokesman David Kyd, "[Nuclear reactors] are built to withstand impact, but not that of a wide-bodied passenger jet full of fuel. A deliberate hit of that sort is something that was never in any scenario at the design stage. These are vulnerable targets and the consequences of a direct hit could be catastrophic."[10] Indeed, despite the increased security measures that have been enacted over the past dec-

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ade and particularly since September 2001, nuclear power plants remain vulnerable:

- Like the IAEA, the NRC has acknowledged that they "did not specifically contemplate attacks by aircraft such as Boeing 757s or 767s and nuclear power plants were not designed to withstand such crashes."[11]

- Through the 1990s, despite months of advanced warning and increased security, 47 percent of nuclear power plants failed to deter small mock terrorist attacks conducted by the NRC.[12]

- In September 2003, Senator Schumer, the Chair of the Senate Democratic Task Force on Homeland Security, stated that given CIA allegations of al-Qaeda's consideration of U.S. nuclear power plants as potential targets, too little has been done to protect and prevent such an attack. Senator Schumer cited design flaws, insufficient security funding, and delayed analysis of potential vulnerabilities in nuclear power plants.[13]

Conclusion and Recommendations

The aforementioned risks are often minimized by proponents of nuclear power who are advocating it as a "green" alternative to fossil fuels, which cause air pollution and contribute to global warming. Although the operation of nuclear power reactors itself does not release significant air pollutants or greenhouse gases, the production of fuel for the reactors utilizes an enormous amount of fossil fuels. In addition, the operation of nuclear plants creates large quantities of high- and low-level nuclear waste that poses a great challenge in terms of management and disposal. U.S. nuclear reactors have created 77,000 tons of high-level radioactive waste, leaving the government with an enormous toxic legacy that will plague the nation for hundreds of thousands of years.

Increased security at a Crystal River Nuclear Power Plant in Florida

Preventing sabotage or terrorist attack against nuclear power plants requires both short- and long-term solutions. In the short-term, state and federal officials, the NRC, and the nuclear industry must work together to develop a strengthened, permanent security system accountably monitored by the NRC. In the long run, however, PSR believes there is no substitute for the phasing-out of nuclear power and replacing it and fossil fuels with safe, renewable and sustainable energy technologies as a viable path to improved health and security.

47 percent of nuclear power plants failed to deter small mock terrorist attacks

Notes

[1] Nuclear Regulatory Commission. "Power Reactors." www.nrc.gov/reactors/power.html. Accessed 21 January 2004.

[2] Nuclear Regulatory Commission. "Non-Power Reactors." www.nrc.gov/reactors/non-power.html. Accessed 21 January 2004.

[3] Lovins AB. *Energy Security Facts: Details and Documentation.* Rocky Mountain Institute. 2 June 2003. 2.

[4] Federal Emergency Management Agency. *Dispersed, Decentralized and Renewable Energy Sources: Alternatives to National Vulnerability and War.* Washington, DC: FEMA, 1980. 12.

[5]The New York Daily Record. 19 October 2001. [110] Quoted on *Moneyline*, CNN. 18 September 2001.

[6] The Central Intelligence Agency. "Terrorist CBRN: Materials and Effects." http://www.cia.gov/cia/reports/terrorist_cbrn/terrorist_CBRN.htm. Accessed 5 July 2005.

[7] Lovins AB, Lovins LH. *Brittle Power: Energy Strategies for National Security.* Andover, Massachusetts: Brick House Publishing Co., 1982. 142-146.

[8] Muirhead CR. "Cancer after nuclear incidents." *Occupational and Environmental Medicine.* Vol. 58, no 7. July 2001.

[9] Environmental Protection Agency. "Understanding Radiation: Health Effects." http://www.epa.gov/radiation/understand/health_effects.htm. Accessed 16 December 2003.

[10] Quoted on *Moneyline*, CNN. 18 September 2001.

[11] Begley S. "Protecting America: The Top 10 Priorities." *Newsweek.* 5 November 2001. 32.

[12] Orrik DN. "Differing Professional Opinion, Nuclear Regulatory Commission." 3 February 1999.

[13] Schumer C. *Two Years Later: Is the Federal Government Doing Enough to Protect New York?: Grading the Federal Homeland Security Effort in New York and the Nation.* http://www.senate.gov/~schumer/SchumerWebsite/pressroom/special_reports/Report%20Card%2003.pdf. September 2003. Accessed 16 December 2003.

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