

August 31, 2005

Rhonda Schwartz, senior producer  
ABC News  
By Fax

Dear Ms. Schwartz,

The nuclear research reactor lab at MIT has a 47-year history of providing safe and effective scientific research that has benefited the United States in many ways, including improving the safety and effectiveness of the nuclear energy industry and medical diagnostics and treatments.



Given the small size and nature of the reactor facility, it is not a likely target for terrorism. MIT has initiated several security studies of the research reactor and is confident that the reactor's containment facility and security guidelines protect the MIT and Cambridge communities from the possibility of harm from the reactor itself. The security of the reactor is continuously monitored and continually upgraded by the Institute.

- Fresh fuel is not stored in the facility and is never present in large enough quantities to create a nuclear weapon.
- At 5 megawatts, the facility is 1/600 the size of a typical nuclear power plant in the U.S. It operates at only 130 degrees Fahrenheit—well below the boiling point for water—and at atmospheric pressure, and hence has no stored energy that could cause a release of radioactive material. (Power plants operate at about 600 degrees and at a pressure of 2,200 psi, about 150 times atmospheric pressure.)
- The reactor's core is quite small, about the size of a dormitory refrigerator, and is fully enclosed in a radiation shielded structure consisting of several feet of concrete and other materials, which itself is housed within the containment building comprising different layers of concrete and steel, all of which would be nearly impossible to breach at one time.
- The MIT reactor is refueled on a just-in-time basis so that the inventory of fresh fuel is usually zero and is never enough to make a nuclear weapon. Once placed in the reactor, the fuel becomes so radioactive that it could not be handled without dense, massive shielding that would require a large truck to move.

- MIT offers tours of the research reactor by appointment only. People requesting tours must provide name, address and identification, which are run through a security review prior to the tour.
- Visitors to the research reactor enter through the reactor's administrative offices, which are located in a building next to the reactor building. They are not allowed to bring backpacks or bags into the reactor building, but must leave them in the administrative offices. Likewise, cameras and recording instruments are not allowed in the reactor building.

MIT believes that the nation benefits from the existence of the research reactor and that it poses no safety or security threat to the community. After 9/11, MIT scrutinized all aspects of campus safety and security, with a particular focus on the research reactor lab:

- MIT's director of security and police chief is a former superintendent of the Massachusetts State Police force who was appointed by the governor to direct and coordinate security at Logan Airport after 9/11. Following the World Trade Center attacks, he and other MIT officials met with law enforcement officials at the local, state and federal levels to implement security upgrades to the already highly effective security at the research reactor.
- MIT also commissioned an independent study to assess the impact of possible terrorist actions against the MIT reactor.
- The independent study ran through all the likely scenarios of attack and concluded that the core of the MIT research reactor would not be breached. The study determined that even in the unlikely event that the exterior building surrounding the reactor core was damaged, the core itself would not be harmed and there would be no release of radiation. It also determined that a large bomb going off in a truck parked within even a few feet of the reactor building would not breach the containment of the reactor's core. If ABC has an expert who claims otherwise, he or she must be assuming: 1) that there is no containment of the reactor's core—MIT's reactor has several layers of several feet of containment; and 2) that the research reactor requires forced convection cooling—which the MIT reactor does not require.
- MIT removed its reactor's floor plans and exterior diagrams from its web site following the 9/11 terrorist attacks. The operating schedule remains online so that researchers from other universities can plan their research schedules around the reactor's availability. If ABC News wrongly assumes the operating schedule is a security threat, it must be assuming that one can tell from that schedule when MIT is conducting sensitive operations, such

as a refueling. This is incorrect. Refueling a research reactor takes only a few hours; most of our shutdown time is for other things. ABC is probably assuming that staffing levels would be lower during shutdowns. That, too, is a false assumption.

The MIT Research Reactor Lab has provided education to hundreds of individuals in the nuclear engineering and nuclear power fields:

- The 5 megawatt facility was one of the first research reactors to open in the United States (in 1958). It has been continually upgraded to take advantage of safety and efficiency improvements.
- MIT has always placed great emphasis on ensuring that the reactor operates safely and securely and the MIT reactor lab has one of the best safety records of any reactor—research or power—in the country. The reactor operates in accordance with all federal regulations, and the federal government inspects the reactor frequently. All of the MIT reactor operators hold licenses, which they obtain after going through a rigorous training program that culminates in a two-day exam.
- The MIT teaching and research facility has been used by hundreds of MIT researchers in completing their bachelor's, master's and doctorate-level research in areas of study as diverse as nuclear power and cancer research.
- The MIT reactor lab also benefits researchers at other universities who do not have access to a research reactor; MIT conducts experiments with those researchers at its laboratory.
- Research in nuclear science and engineering leads to many applications, the most well-known being the generation of electricity from the fission of uranium. Twenty percent of this country's electricity is supplied by nuclear power plants and this percentage is expected to grow in the future. The research reactors at MIT and other universities do not contribute directly to this power supply, but they have a long tradition of creating engineering designs that have improved the safety and reliability of nuclear power plants.
- More recent work at the MIT research reactor has focused on next-generation power reactors that will be built in the decades ahead to produce hydrogen gas to serve as a substitute for oil-based fuels.

Research at the MIT reactor lab is performed in areas other than energy, including improved medical diagnostics and treatments that continue to help individuals around the world. Among the projects carried out at the MIT reactor laboratory are:

- trace element analysis for the investigation of the origin of air pollutants.
- phase-contrast imaging, a technique that may eventually be used to screen cargo in order to enhance security at major entry points to the U.S.
- cancer research to design materials and methods to deliver medicine directly to brain and prostate tumors.
- provision of materials required by medical facilities for nuclear medicine.

If you have questions about any of this information, please contact me.

Sincerely yours,

Denise Brehm  
Senior Communications Officer