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NUCLEAR SECURITY

Action May Be Needed to Reassess the Security of NRC-Licensed Research Reactors

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Highlights

Highlights of GAO-08-403, a report to the Ranking Member, Subcommittee on National Security and Foreign Affairs, Committee on Oversight and Government Reform, House of Representatives

Why GAO Did This Study

There are 37 research reactors in the United States, mostly located on college campuses. Of these, 33 reactors are licensed and regulated by the Nuclear Regulatory Commission (NRC). Four are operated by the Department of Energy (DOE) and are located at three national laboratories. Although less powerful than commercial nuclear power reactors, research reactors may still be attractive targets for terrorists. As requested, GAO examined the (1) basis on which DOE and NRC established the security and emergency response requirements for DOE and NRC-licensed research reactors and (2) progress that the National Nuclear Security Administration (NNSA) has made in converting U.S. research reactors that use highly enriched uranium (HEU) to low enriched uranium (LEU) fuel.

This report summarizes the findings of GAO's classified report on the security of research reactors (GAO-08-156C).

What GAO Recommends

GAO recommends that NRC reassess the consequences of terrorist attacks on NRC-licensed research reactors using assumptions that better reflect a fuller range of expert opinion on reactor security.

NNSA and DOE generally agreed with the report. NRC disagreed with the report in several areas. GAO continues to believe that given the uncertainty associated with NRC's security assessment, it is important that NRC reassess the consequences of a terrorist attack on research reactors.

To view the full product, including the scope and methodology, click on GAO-08-403. For more information, contact Gene Aloise at (202) 512-3841 or aloisee@gao.gov.

What GAO Found

DOE developed the security and emergency response requirements for its research reactors using its Design Basis Threat—a process that establishes a baseline threat for which minimum security measures should be developed. These research reactors benefit from the greater security required for the national laboratories where they are located, which store weapons-usable nuclear materials. DOE also has concluded that the consequences of an attack at some of its research reactors could be severe, causing radioactivity to be dispersed over many square miles and requiring the evacuation of nearby areas. As a result, all facilities where DOE reactors are located have extensive plans and procedures for responding to security incidents.

NRC based its security and emergency response requirements largely on the regulations it had in place before September 2001. NRC decided that the security assessment it conducted between 2003 and 2006 showed that these requirements were sufficient. While it was conducting this assessment, NRC worked with licensees to improve security when weaknesses were detected. However, GAO found that NRC's assessment contains questionable assumptions that create uncertainty about whether the assessment reflects the full range of security risks and potential consequences of attacks on research reactors. For example, Sandia National Laboratories (SNL)—a contractor NRC used to assist in performing its assessment— found that some NRC-licensed research reactors may not be prepared for certain types of attacks. However, NRC disagreed with SNL's finding. In 2006, NRC concluded that the consequences of attacks would result in minimal radiological exposure to the public. In addition, NRC assumed that terrorists would use certain tactics in attacking a reactor but did not fully consider alternative attack scenarios that could be more damaging. Finally, NRC assumed that a small part of a reactor could be damaged in an attack, resulting in the release of only a small amount of radioactivity. However, according to experts at Idaho National Laboratories and the Department of Homeland Security, it is possible that a larger part of a reactor could be damaged, which could result in the release of larger amounts of radioactivity.

NNSA has made progress in changing from HEU to LEU fuel in U.S. research reactors but may face difficulty in converting some of the remaining research reactors. Since 1978, NNSA has converted eight currently operating U.S. research reactors, including two in 2006. In addition, NNSA plans to convert 10 more U.S. research reactors by September 2014—five of which are scheduled for conversion by 2009. However, NNSA faces difficulties in converting the remaining five reactors because these reactors cannot operate with the currently available LEU fuel. NNSA is now developing a new LEU fuel that will allow the remaining five reactors to operate. However, according to NNSA, developing this fuel has been problematic, as early efforts experienced failures during testing. NNSA officials acknowledged that further setbacks are likely to delay plans to convert these research reactors.