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Date: April 6, 2005

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FOR IMMEDIATE RELEASE

Spent Fuel Stored in Pools at Some U.S. Nuclear Power Plants Potentially at Risk From Terrorist Attacks; Prompt Measures Needed to Reduce Vulnerabilities

WASHINGTON -- Spent nuclear fuel stored in pools at some of the nation's 103 operating commercial nuclear reactors may be at risk from terrorist attacks, says a new report from a committee of the National Academies' Board on Radioactive Waste Management. The report calls on the U.S. Nuclear Regulatory Commission (USNRC) to conduct additional analyses to obtain a better understanding of potential risks and to ensure that power-plant operators take prompt and effective measures to reduce the possible consequences of such attacks. Because potential threats may differ according to a specific plant's design, the committee recommended that plant-by-plant vulnerability analyses be performed.

These conclusions were based on a detailed review of security analyses performed by the USNRC, U.S. Department of Homeland Security, the nuclear power industry, and independent experts. The committee noted that many security improvements have been instituted at U.S. commercial nuclear power plants since the events of Sept. 11, 2001. On several important questions, however, it was unable to obtain enough information from the USNRC to assess their effectiveness. The committee therefore recommends that an assessment of such measures should be undertaken by an organization independent of the USNRC and the nuclear industry.

"Within the six-month time frame requested by Congress, our committee of technical experts completed a very sound, evidence-based analysis," said committee chair Louis J. Lanzerotti, distinguished research professor at the New Jersey Institute of Technology, Newark, and consultant, Bell Labs, Lucent Technologies, Murray Hill, N.J. "We received input both from scientific professionals and the public. Our findings were unanimous. While the committee identified several terrorist attack scenarios that could have potentially severe consequences if

carried out successfully, we also identified two relatively simple measures that could be implemented immediately at vulnerable plants to greatly reduce the risks."

The committee found that an attack which partially or completely drains a plant's spent fuel pool might be capable of starting a high-temperature fire that could release large quantities of radioactive material into the environment. The committee recommended that two measures be taken promptly to reduce the potential for such fires: reconfiguring the position of fuel assemblies in the pools to more evenly distribute decay-heat loads, and making provisions for water-spray systems to cool the fuel that could continue to operate even after the pool or the building in which it is housed is damaged.

The first measure could probably be implemented at all plants with minimal cost and time, and with little exposure of workers to radiation, the committee said. It recommended that the costs and benefits of options for implementing the water-spray system should be examined to decide what requirements should be imposed. Such systems may not be needed at plants where spent fuel pools are located below ground level or are otherwise protected from external line-of-sight attacks.

Congress requested the study following conflicting claims in the media about the safety and security of spent fuel in storage at commercial nuclear power plants, including the risks that spent fuel might be used to construct a radiological dispersal device, or "dirty bomb." The committee concluded the likelihood that terrorists could steal enough spent nuclear fuel from a power plant for use in a dirty bomb is small, given existing security measures. Nevertheless, the USNRC should review and upgrade where necessary its security requirements for protecting those spent fuel rods not contained in fuel assemblies from theft by knowledgeable insiders.

The report being issued today is the public version of a classified report delivered to Congress, USNRC, and the Department of Homeland Security in July 2004. The National Academies obtained the USNRC's cooperation in producing this public report. It contains all of the findings and recommendations of the original classified report, but some have been slightly reworded. Classified national security information and safeguards information have been redacted.

"We believe this report fulfills our responsibility to inform the public and elected officials on a critical national security issue," said Bruce Alberts, president of the National Academy of Sciences. "It also satisfies a second, equally important imperative: to ensure that this report contains no information that might inadvertently aid terrorists. We appreciate the Nuclear Regulatory Commission's assistance in confirming that."

As part of the study, the committee was asked to examine the possible advantages

of dry cask storage over pool storage at commercial power-plant sites. The report concludes that pools are necessary to cool spent fuel immediately after its removal from a reactor. But dry cask storage has two advantages for storing spent fuel older than about five years: It is a passive system that relies on air circulation for cooling, and it divides the inventory of spent fuel into a number of individual, robust containers, each containing only a small amount of the total inventory. The committee found that although there are some differences in the robustness of different dry cask designs under various terrorist attack scenarios, the differences are not large, and relatively simple steps could be taken to further reduce potential vulnerabilities.

Once the USNRC completes the recommended plant-specific vulnerability analyses, the agency may conclude that earlier movements of spent fuel from pools into dry cask storage would be prudent at some plants, the report says. The committee was not specifically asked by Congress to recommend whether the transfer of spent fuel rods from pools to a system of dry cask storage should be accelerated, however. Cost-benefit considerations also would be an important part of such decisions.

Finally, the committee observed during the course of its work that current classification and security practices appear to be impeding the sharing of valuable information between the USNRC and nuclear industry operators, negatively impacting constructive feedback and cooperation. The committee recommended that the USNRC improve the sharing of pertinent information on its security analyses of spent fuel storage with nuclear power plants operators and system vendors. More constructive interaction with the public and with independent analysts also could increase confidence in USNRC and industry decisions and their actions to reduce the vulnerability of spent fuel storage to terrorist attacks

This study was sponsored by the U.S. Nuclear Regulatory Commission and U.S. Department of Homeland Security. The Board on Radioactive Waste Management is part of the National Research Council, the principal operating arm of the National Academy of Sciences and the National Academy of Engineering. They are private, nonprofit institutions that provide science and technology advice under a congressional charter. A committee roster follows.

Copies of **[Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report](#)** are available from the National Academies Press; tel. 202-334-3313 or 1-800-624-6242 or order on the Internet at <http://www.nap.edu>. Reporters may obtain a copy from the Office of News and Public Information (contacts listed above).

[This news release and report are available at <http://national-academies.org>]

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Division on Earth and Life Studies
Board on Radioactive Waste Management

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