

PRM-51-10  
(71FR64169)

March 14, 2007

DOCKETED  
USNRC

Secretary, U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001  
Attn: Rule Makings and Adjudications Staff

March 14, 2007 (4:56pm)

OFFICE OF SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

Re: Petition for Rulemaking [Docket No. PRM-51-10]

Greetings:

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We are writing in support of the Petition for Rulemaking filed on August 25, 2006 by the Attorney General for the State of Massachusetts. The petition is seeking a rule making by Nuclear Regulatory Commission (NRC) to:

- determine whether the potential environmental impacts of high-density spent fuel pool storage are significant; and
- require that any NRC licensing decision relative to high-density spent fuel pool storage be accompanied by an environmental impact statement that addresses the environmental impacts of this form of storage and alternatives to avoid or mitigate environmental impacts.

In 1996 the NRC issued a Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Power Plants (NUREG-1437) which dismissed the issue in a single sentence at the end of section 6.4.6.1: "NRC has also found that, even under the worst probable cause of a loss of spent-fuel coolant (a severe seismic-generated accident causing catastrophic failure of the pool) the likelihood of a fuel-cladding fire is highly remote. (55A FRA 38474)"

As experts involved in technical and policy issues relative to nuclear safety, security and specifically, spent reactor fuel storage (see attachment), we are providing the following comments:

- (1) Contrary to the NRC finding in NUREG-1437, in an age of terrorism, although it is not quantifiable, the probability of a spent pool being drained and a zirconium fire resulting in dense-packed fuel cannot be dismissed as remote. In 2003, an independent study that we co-authored concluded, among other things, that a terrorist attack should not be ruled out by the NRC and that the potential consequences resulting from pool drainage and a subsequent fuel cladding fire could result in severe consequences.<sup>1</sup> In 2005, a committee of the National Academies National Research Council commissioned by the U.S. Congress agreed that, "it is not prudent to dismiss nuclear plants, including

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<sup>1</sup> Alvarez, R, J. Beyea, Jan Janberg, J. Kang, E. Lyman, A. Macfarlane, G. Thompson, F.N. von Hippel, Reducing the Hazards of Stored Spent-Power Reactor Fuel in the United States, Science and Global Security, Vol. 11, pp. 1-51. (Alvarez et al 2003)

Template = SECY-067

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spent fuel storage facilities as undesirable targets for terrorists...<sup>2</sup> [and] “that, under some conditions, a terrorist attack that partially or completely drained a spent fuel pool could lead to a propagating zirconium cladding fire and release large quantities of radioactive materials to the environment.”<sup>3</sup>

- (2) Therefore, the potential consequences of such an event should be considered in EISs associated with licensing actions relating to dense-packing of spent fuel pools or extension of licenses at reactors with dense-packed pools. Of particular concern is the potential for enormous land contamination from radionuclides such as Cesium-137 resulting from a fuel pool fire. These dangers are underscored by the April 1986 Chernobyl accident, which resulted in the permanent evacuation of more than 100,000 residents and created a radiation control area contaminated by Cs-137 of 10,000 km, nearly half of the area of Massachusetts. A fire releasing 10 percent of the Cs-137 in a dense-packed spent fuel pool, might result in an area of contamination substantially greater than created by the Chernobyl accident.<sup>4</sup>
- (3) Additionally, in such EIS's the efficacy of actions that could mitigate these consequences should be considered. These include near term actions such as reconfiguration of fresh and aged spent fuel in pools (“checkerboarding”), pre-installed water sprays, reinforcing pools walls etc. We believe the most important action is to thin out the pools to reduce ignition risks, and to place spent fuel that has cooled for more than five years into hardened dry casks.
- (4) As a basis for such EISs, it will be necessary for the NRC to carry out generic technical analyses bearing on the effectiveness of various proposed mitigating measures if a spent fuel pool were drained.
- (5) Such analyses can be published without revealing to potential terrorists how to accomplish the draining of specific pools. Given the capacity that the NRC has displayed over the past decades to downplay this issue and to over-claim about the significance of classified studies done for or by its staff, it is essential that these studies be available for independent peer review.

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<sup>2</sup>National Research Council, Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage Board on Radioactive Waste Management Safety and Security of Commercial Spent Fuel Storage, (National Academy Press, 2005) p.35.

<sup>3</sup> National Research Council, 2005, p. 57.

<sup>4</sup> Jan Beyea, Ed Lyman and Frank von Hippel, “Damages from a Major Release of <sup>137</sup>Cs into the Atmosphere of the United States,” *Science and Global Security* 12 (2004), p. 125.

Sincerely,

Robert Alvarez  
Senior Scholar  
Institute for Policy Studies

Frank von Hippel  
Professor of Public and  
International Affairs  
Program on Science and  
Global Security  
Princeton University

Edwin Lyman  
Staff Scientist  
Union of Concerned  
Scientists

Attachment

**Frank von Hippel**, a nuclear physicist, is a Professor of Public and International Affairs at Princeton University. He has worked on fissile material policy issues for the past 30 years including those relating to commercialization of plutonium recycle, ending the production of plutonium and highly-enriched uranium for weapons, and ending the use of highly enriched uranium as a reactor fuel. In 1993-4, he served as Assistant Director for National Security in the White House Office of Science and Technology Policy. He was a MacArthur Foundation Prize Fellow during 1993-98. He is currently Co-Chair of the International Panel on Fissile Materials.

**Edwin Lyman** is a senior scientist in the Global Security program at the Union of Concerned Scientists in Washington, DC, a position he has held since May 2003. Before coming to UCS, he was president of the Nuclear Control Institute, a Washington-based organization committed to nuclear nonproliferation. He earned a doctorate in physics from Cornell University in 1992. From 1992 to 1995, he was a postdoctoral research associate at Princeton University's Center for Energy and Environmental Studies (now the Science and Global Security Program). His research focuses on the prevention of nuclear proliferation and nuclear terrorism. He has published articles and letters in journals and magazines including *Science*, *The Bulletin of the Atomic Scientists* and *Science and Global Security*. He is an active member of the Institute of Nuclear Materials Management. In the spring of 2001, he served on a Nuclear Regulatory Commission expert panel on the role and direction of the NRC Office of Nuclear Regulatory Research and briefed the Commission on his findings. In July 2001, he was again invited to a Commission meeting to discuss the licensing of new nuclear reactors in the United States. He also testified in March 2003 in the House of Representatives on US energy policy. He is the author of the 2004 report "Chernobyl-on-the-Hudson?," a technical analysis of the radiological consequences of a terrorist attack at the Indian Point nuclear power plant near New York City. In January 2005, he testified as an expert witness during an NRC hearing on the security arrangements for mixed-oxide fuel (MOX) fuel assemblies that were sent to a US nuclear power plant as part of the US-Russian plutonium disposition program. In May 2005, he testified at a Senate subcommittee oversight hearing on the NRC's regulation of safety and security at nuclear power plants.

**Robert Alvarez** is a Senior Scholar at the Institute for Policy Studies in Washington, D.C. Between 1993 and 1999, Mr. Alvarez served as a Senior Policy Advisor to the Secretary of Energy for National Security, Environmental Safety and Health, and Labor. Prior to joining the DOE, Mr. Alvarez served for five years (1988-93) as Chief Investigator for the U. S. Senate Committee on Governmental Affairs, Chaired by Senator John Glenn. He is the author of several reports and studies regarding military and civilian nuclear energy applications.

**From:** Robert Alvarez <kitbob@erols.com>  
**To:** <SECY@nrc.gov>  
**Date:** Wed, Mar 14, 2007 4:51 PM  
**Subject:** comments re:Petition for Rulemaking [Docket No. PRM-51-10]

Greetings --

Attached are our comments in support of the the Petition for Rulemaking filed on August 25, 2006 by the Attorney General for the State of Massachusetts [Docket No. PRM-51-10], and an attachment with our biographical information.

If you have any questions please feel free to call me at: 301-585-7672

Sincerely,

Robert Alvarez

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