



COMMENTS ON THE DEPARTMENT OF ENERGY'S STORAGE AND DISPOSITION OF WEAPONS-USABLE FISSILE MATERIALS DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Nuclear Control Institute

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EXECUTIVE SUMMARY

Non-Proliferation Issues

- The nonproliferation analysis is an integral element of the screening criteria and decisions made in preparing the DPEIS, and should therefore be made a formal part of the PEIS, rather than the subject of a separate process.
- The Secretary of Energy should extend the public comment period until 45 days after all relevant support documents, including the cost and non-proliferation analyses, are made publicly available.
- The 1994 NAS study on the disposition of excess weapon plutonium proposed three proliferation risk factors for use in comparing plutonium-disposition options: risk of theft; risk of reversal; and impact on arms reduction. These criteria should be incorporated into the PEIS's non-proliferation analysis.
- Judged by each of these criteria, the option of irradiating weapons plutonium in nuclear reactors (the MOX option) poses far greater proliferation risks than the option of vitrifying plutonium with highly radioactive waste (the VHLW option).
- The MOX option presents a greater risk of diversion primarily because of the fuel-fabrication stage, a process that is difficult to safeguard effectively. Such uncertain verification could severely limit the trust nations place in an international nuclear arms-reductions and non-proliferation regime predicated upon recycling warhead plutonium as fuel for reactors.
- The DPEIS fails to consider the "can-in-a-canister" vitrification option, now being developed at Savannah River and Livermore, despite the great promise it has shown. It must receive specific analysis and consideration in the PEIS.
- The proliferation resistance of the final waste forms largely determines the potential reversibility of plutonium disposition, but the DPEIS fails to examine these issues. A detailed comparative analysis of plutonium retrievability from spent MOX fuel and immobilized glass and ceramic waste forms must be included.
- Isotopic composition of the residual plutonium in the final waste forms is an inappropriate criterion by which to assess proliferation risks because it perpetuates a dangerous myth that

reactor-grade plutonium cannot be used to make workable weapons. The ability to construct a weapon from reactor-grade plutonium was demonstrated decades ago. It is dangerous even to consider it an open question. Isotopic degradation does not pose a substantial barrier to re-militarization of warhead plutonium, and therefore does not constitute a compelling argument in favor of the MOX option---a conclusion shared by the 1995 NAS study.

- The MOX option would clearly encourage the civil use of plutonium. The U.S. Government would be engaging in MOX activities for the first time on a commercial scale, legitimizing the use of MOX in civil nuclear power programs. Such a sea change in U.S. policy would confuse and complicate U.S. non-proliferation diplomacy. It would send the wrong signal to Western Europe, Japan, and other non-nuclear-weapon states.
- The MOX option sends the wrong fuel cycle policy signal in three ways. First, the MOX option effectively declares that plutonium has an asset value, and that the energy contained within it should be viewed as a national asset. Second, the MOX option suggests that a plutonium fuel cycle can be effectively safeguarded, and the use of MOX for weapons plutonium disposition would surely be cited by plutonium advocates as a government "seal of approval" on the process. Third, the MOX option would be portrayed as giving credibility to the claim that plutonium recycle in light-water reactors (LWRs) is essential to nuclear waste management.
- While we strongly favor the immobilization options generally over the reactor options, we do not support all the immobilization options. We strongly oppose the electrometallurgical treatment alternative ("pyroprocessing"). This opposition is supported by the conclusions of studies by the National Academy of Sciences, and even DOE's own internal memo.

Transportation Security Issues

- The selection of any reactor disposition option will increase transportation risks by adding two extra transportation steps to the disposition process. Weapons-grade plutonium will have to be transported from a plutonium conversion facility to a MOX fuel fabrication plant. MOX fuel would be sent from the fuel fabrication plant to a reactor site or sites.
- Transport risks would increase even more if a decision were made to fabricate MOX fuel in Europe, pending construction of a domestic fuel fabrication plant. This scenario would require trans-Atlantic sea shipments of weapons-grade plutonium and unirradiated MOX reactor fuel.
- Any of the immobilization options would require less transportation of weapons-usable materials and thereby reduce safety and security risks, a conclusion shared by the 1995 NAS study.
- There should be an explicit requirement for an armed military escort for U.S. sea shipments of weapons-grade plutonium and mixed-oxide reactor fuel fabricated from it. The DPEIS needs to state publicly what level of security will be required for shipments of plutonium and MOX. Anything less than an armed military escort should be unacceptable.
- The DPEIS does not discuss the security arrangements for sea shipments of plutonium or MOX reactor fuel. Some aspects of these arrangements can and should be made a part of the public record and subject to independent evaluation.

Transportation Safety Issues

- No air shipments of plutonium or MOX should be allowed, given that a crashworthy air-shipment cask has not been developed for these materials.
- The DPEIS understates the environmental hazards of transporting radioactive material by embracing the current international ("Type B") transport standards and assigning a low probability to an accident that could result in a breach of the cask. The DPEIS disregards recent expert reports that challenge the adequacy of the current international standards, as

well as ongoing initiatives within the IAEA and the International Maritime Organization (IMO) to re-evaluate these standards in the context of historical data about accident conditions. The DPEIS's analysis is cursory and outdated, and must be revised to take into account the most recent studies and the ongoing IAEA and IMO re-evaluations of these casks.

- Given the amounts of plutonium and MOX that could be transported for disposition, it would be prudent to test the shipping casks to failure and to evaluate the findings in the PEIS.

Economic Issues

- Like the non-proliferation analysis, the cost analysis of plutonium disposition options now being prepared by Oak Ridge National Laboratory must be integrated into the NEPA decision-making process.
- The cost analysis must include all costs of the various disposition options, including subsidies being demanded by nuclear electrical utilities that have expressed interest in using weapons-plutonium MOX fuel.
- Cost comparisons for the different plutonium disposition options should also reflect the cost of security requirements for sea shipments.

I. Introduction

The Nuclear Control Institute ("NCI") is a non-profit policy research group that seeks to increase understanding in the U.S. and other countries of proliferation and terrorism risks associated with civilian uses of nuclear-weapon materials---plutonium and highly enriched uranium. NCI is concerned that certain plutonium-disposition options considered in the *Storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement* ("DPEIS")¹ contribute to those risks.

The Department of Energy (DOE) proposes that a disposition strategy be implemented for the 38.2 metric tons of U.S. weapon-usable plutonium that has been declared surplus, as well as any additional material designated as surplus in the future. This strategy will entail rendering such weapon-usable plutonium as inaccessible and unattractive for weapons use as the plutonium contained in spent nuclear fuel from commercial power reactors, a criterion known as the "spent fuel standard." The objectives of this approach are to strengthen the irreversibility of nuclear arms reductions and to reduce the risks of diversion or theft of the material.

NCI is concerned, however, that arms-reduction and non-proliferation objectives will be undercut if surplus plutonium is used as fuel in nuclear power reactors (the MOX option) rather than directly disposed of in waste (the vitrification option). We are also concerned with issues associated with environmental safety and health, transportation safety and security, economics, legal and regulatory matters, and fulfillment of DOE obligations under the National Environmental Policy Act (NEPA). All these concerns are elaborated in this set of comments, with the exception of environmental safety and health issues, which are addressed in a separate set of comments prepared by Dr. Edwin Lyman, scientific director of the Nuclear Control Institute.²

II. Non-Proliferation and Cost Analyses Must Be Included in DPEIS

Two key DOE analyses for use in consideration of plutonium disposition alternatives are not yet completed. DOE is still preparing a cost analysis and a non-proliferation analysis of disposition options. At the April 18 public hearing on the DPEIS, Greg Rudy, head of the Office of Fissile Material Disposition, stated that those analyses would eventually be made available to the public when completed, but not prior to the end of the comment period, then scheduled to end on May 7. At the request of NCI and several other public-interest groups and stakeholders,³ the comment period was extended until June 7, but DOE said that "while [DOE] does not intend to incorporate such [non-proliferation and cost] reports within the PEIS, they will be made available for public

review this summer."4 Mr. Rudy asserted that these analyses are not required for inclusion in the PEIS process which focuses on environmental issues.

This is an inappropriately narrow view of the scope of programmatic environmental impact statements. Previous EIS's, such as the spent fuel take-back PEIS, have included detailed nonproliferation analysis, even making non-proliferation a primary decision criterion.5 Cost analysis has been included as a decision factor in some EIS's as well.6 Indeed, even the draft plutonium disposition DPEIS explicitly cites "non-proliferation," "security," and "cost-effectiveness" as among the screening criteria used in the disposition PEIS process to rule out certain disposition alternatives.7 Certainly the analyses used to support these cost and non-proliferation decisions should be incorporated into the PEIS itself.

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End Notes

1. Office of Fissile Materials Disposition, U.S. Department of Energy, *Storage and Disposition of Weapons- Usable Fissile Materials Draft Programmatic Environmental Impact Statement*, DOE/EIS-0229-D, February 1996, Volumes I, II, III, and summary (hereafter referred to as "DPEIS"). [Back to document](#)
2. Dr. Edwin Lyman, "Public and Occupational Health and Safety Impacts of Plutonium Disposition Alternatives," Nuclear Control Institute, June 7, 1996. [Back to document](#)
3. Letter from Nuclear Control Institute, Greenpeace International, Nuclear Waste Citizens Coalition, Physicians for Social Responsibility, Institute for Science and International Security, and Nuclear Information Resource Service, to Energy Secretary Hazel O'Leary, April 29, 1996. [Back to document](#)
4. Letter from Greg Rudy, Office of Fissile Materials Disposition, to Nuclear Control Institute, Nuclear Waste Citizens Coalition, Nuclear Information Resource Service, Greenpeace International, Institute for Science & International Security, and Physicians for Social Responsibility, May 6, 1996. [Back to document](#)
5. *Final Environmental Impact Statement: Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel*, DOE/EIS-0218F, February 1996, Summary, pp. 51-59 (non-proliferation impacts of alternatives analyzed and compared); *Draft F-Canyon Plutonium Solutions Environmental Impact Statement*, DOE/EIS-0219D, August 1994, p. 2-13 ("security and nonproliferation" decision criterion "relates to how well each alternative supports national security objectives and nonproliferation"); *Draft Environmental Impact Statement: Interim Management of Nuclear Materials*, DOE/EIS- 0220D, March 1995, p. 2-46 (decision criterion language identical to F-Canyon draft EIS); *Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling*, DOE/EIS-0161, Volume I, October 1995, p. S-8 (commercial irradiation services alternative ruled out of draft PEIS based on "nonproliferation concerns"; later incorporated into final PEIS based in part on "further consideration of nonproliferation issues"); *Disposition of Surplus Highly Enriched Uranium Draft Environmental Impact Statement*, DOE/EIS-0240-DS, October 1995, Summary, p. S-7 ("criteria against which to judge potential alternatives" based on President Clinton's 1993 nonproliferation policy and 1994 NAS report on plutonium disposition; "[t]hese criteria included [inter alia] nonproliferation; security ...". [Back to document](#)
6. *Spent Fuel Take-Back EIS*, op. cit, pp. 62-63 (costs of alternatives analyzed and compared); *Savannah River Site Waste Management: Draft Environmental Impact Statement*, DOE/EIS-0217D, Volume I, January 1995, p. 2-78 ("A technology had to meet the following criteria to be deemed a potential technology ... (3) Its costs were comparable to other possible technologies"); *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs: Final Environmental*

Impact Statement, DOE/EIS-0203-F, Volume I, Summary, April 1995, p. 37 ("cost of implementation" a decision criterion, and comparative cost analysis integrated into PEIS); *Draft Programmatic Environmental Impact Statement for Stockpile Stewardship and Management*, DOE/EIS-0236, Volume I, February 1996, p. 3-1 ("planning assumptions and basis for analysis" in PEIS include "[m]aximize efficiency and minimize cost and waste consistent with programmatic needs"); *Surplus HEU Disposition Draft EIS*, op. cit, p. S-7 ("cost-effectiveness" among "criteria against which to judge potential alternatives"). [Back to document](#)

7. DPEIS, Summary, p. S-5. [Back to document](#)

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