June 7, 1996

Mr. Greg Rudy
Acting Director
Office of Fissile Materials Disposition
U.S. Department of Energy
1000 Independence Ave. NW
Washington, DC 20585

Dear Mr. Rudy:

We are writing to provide our comments on the *Storage and Disposition of Weapons- Usable Fissile Materials Draft Programmatic Environmental Impact Statement* ("DPEIS"). Despite the substantial effort that went into preparation of the draft analysis, there are a number of important issues that were given inadequate attention or no attention at all. These defects, as discussed below, must be corrected if the final PEIS is to meet the requirements of the National Environmental Policy Act and the Department of Energy's (DOE) implementing regulations (10 C.F.R. 1021).

Nonproliferation and Cost Analyses Must Be Included in the DPEIS and Integrated Into the NEPA Decision-Making Process

DOE is still preparing a cost analysis and a non-proliferation analysis of disposition options. At the April 18 public hearing on the DPEIS, you stated that those analyses eventually would be made available to the public when completed, but not prior to the end of the comment period, then scheduled for May 7. (At the urging of several public-interest groups, including some of those signing this letter, the comment period was extended to June 7, but not to 45 days after the cost and nonproliferation analyses are made publicly available, as requested.)

DOE claims that these analyses are not required for inclusion in the PEIS, which focuses on environmental issues. This is an inappropriately narrow view of the scope of programmatic environmental impact statements. As spelled out in the letter to Secretary O'Leary of April 5 requesting the delay, previous EIS's have included detailed nonproliferation analyses, even making non-proliferation a primary decision criterion. Cost analyses have been included as decision factors in a number of EISs, as well. The 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. Certainly the cost and non-proliferation analyses used to support these decisions must be incorporated into the PEIS itself.

It is our position, therefore, that the public comment period should remain open until 45 days after all relevant support documents, including the cost and non-proliferation analyses, are made publicly available. Therefore, these analyses, together with public comments on them, must be fully integrated in the Department's decision- making process under NEPA.

Issues That Must Be Included in the Nonproliferation Analysis

The National Academy of Sciences' (NAS) 1994 study[1] of weapons-plutonium disposition proposed three proliferation risk factors for use in comparing plutonium-disposition options: risk of theft, risk of reversal, and impact on arms reduction. These are important criteria that should guide DOE's analysis, but the DPEIS does not specifically address them. These risks must be fully evaluated in the non- proliferation analysis and be made part of the DPEIS.

Analysis of the *risk of theft and diversion* must include a thorough examination of difficulties encountered with plutonium accountancy at mixed-oxide (MOX) fuel fabrication plants. In particular, the 70-kilogram plutonium discrepancy at the Plutonium Fuel Production Facility (PFPF) in Japan is now the subject of an extensive clean-out inspection by the International Atomic Energy Agency (IAEA). The discrepancy results from excessive hold-up of plutonium in the process line of this purportedly a state-of-the-art MOX fuel fabrication facility, and raises serious questions as to whether MOX disposition options can be adequately safeguarded. Nor does the lack of knowledge by the IAEA of the results of in-process materials accounting at MOX fabrication plants within Euratom provide any basis for assuming that these plants are subject to effective safeguards either.

Analysis of the *risk of reversal* must address the comparative difficulty of retrieving plutonium from final waste forms. Appendix H of the DPEIS, "High-Level Waste Forms Comparative Analysis," 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 along with the factors already addressed, such as regulatory issues, criticality, thermal load, radiation, and releases.

Analysis of *risks to arms control and nonproliferation* must include a thorough assessment of the international repercussions of a U.S. decision on disposition technology. The DPEIS implicitly acknowledges the importance of what the NAS study called the "fuel cycle policy signal" when it posits that one of the goals of the disposition process is "to strengthen national and international arms control efforts by providing a storage and disposition model for the international community." But the DPEIS does not explicitly consider the fuel cycle policy signal that the MOX option would send relative to alternative immobilization options.

In its September 27, 1993 non-proliferation policy statement, the Clinton administration declared that "the United States does not encourage the civil use of plutonium and, accordingly, does not itself engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes." The possibility that the MOX option would have an adverse affect on U.S. non- proliferation policy by stimulating the use of MOX in civil nuclear power programs and thereby encouraging plutonium reprocessing and recycling must be addressed in the DPEIS's analysis.

Cost Analysis Must Include Subsidies to Nuclear Utilities and Be Integrated into the NEPA Decision-Making Process

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. That 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. Given recent regulatory changes and the severe diseconomics of nuclear electricity generated at some facilities, these utilities face strong competition from non-nuclear electrical generators. An industry technical analysis fully anticipates that some utilities will insist upon not simply compensation for direct costs related to warhead plutonium disposition in their reactors, but subsidization of the electricity these reactors produce to guarantee that it is economically competitive with electricity from alternative non-nuclear sources, a subsidy that could cost U.S. taxpayers billions of dollars over the life of the plutonium-disposition program.2 These costs must be carefully calculated in advance, so that they can be taken into account in the decision on disposition alternatives.

Pyroprocessing Immobilization Alternative Must Be Fairly Assessed

The DPEIS (Section 2.4.3.3) posits "electrometallurgical treatment" as one of the immobilization options. This technology, also known as "pyroprocessing," was developed by Argonne National Laboratory as part of the Integral Fast Reactor (IFR) Program, which DOE has since cancelled, largely on non-proliferation grounds.

Because it involves reprocessing technology, pyroprocessing poses a proliferation risk and undercuts U.S. non-proliferation policy aimed at discouraging reprocessing. Nor is it a sensible technical alternative; both a recent National Academy of Sciences study and an internal DOE report3 reject it as a viable weapons-plutonium disposition alternative. DOE has ignored these considerations in its analysis. They must be included in the Final PEIS analysis, which, accordingly, must reject electrometallurgical treatment as an option for plutonium disposition.

Safety and Health Impacts of Disposition Options Must Be Consistently and Accurately Assessed

A major objective of the DPEIS should be to present a thorough evaluation of the occupational and public health risks of different weapons-plutonium disposition options. Disposition options then should be ranked according to the risks they pose, and this ranking should play an important role in the eventual choice of disposition option.

The DPEIS, however, fails to accomplish this objective. Its methodology for evaluating and comparing the safety risks of different disposition options is logically inconsistent and confusing. These inconsistencies serve to exaggerate the risks of the immobilization options relative to the reactor-based options. They must be corrected in the final version to provide a fair presentation of the evaluation and ranking of the safety risks of immobilization and reactor-based disposition options.

Such a presentation would show that the health and safety impacts of the immobilization options will be substantially lower than those associated with the reactor options. However, the DPEIS is structured to minimize the significance of this fact.

What follows is a partial listing of the deficiencies we have identified:

- The DPEIS overestimates the safety and health impacts of the immobilization options by explicitly including only the absolute impacts of options requiring new facilities, and not the incremental impacts associated with existing facility process variants, such as can-in-canister at the Defense Waste Processing Facility (DWPF). On the other hand, the DPEIS does explicitly evaluate the incremental impacts of the existing Light Water Reactor (LWR) MOX option with respect to normal (as distinguished from accidental) emissions. This leads to an inconsistent comparison of the two options.

- The accident analysis of the LWR option is based entirely on an irrelevant case, an evolutionary LWR fueled with low-enriched uranium, which does not account for the numerous unresolved safety issues associated with the use of full-core, weapons-grade MOX fuel in *existing* LWRs or CANDUs. As a result, the important issue of how accident impacts may increase if MOX is substituted for LEU in existing reactors is not addressed. This is a crucial point because the incremental accident risks resulting from this substitution may actually exceed the *absolute* risks of an evolutionary LWR accident as cited in the DPEIS.

- A DPEIS reference document4 lists LWR accidents with higher frequency *and* greater consequences than the most severe LWR accident sequence evaluated in the DPEIS;

- The geographical range of the safety analysis is unjustifiably limited: the choice of an 80-km threshold for consideration of public health impacts leads to absurd conclusions, such as the notion that an accident in a Canadian CANDU reactor would have no environmental impact in the US;

- The absence of discussion of economic and other external factors severely impairs the credibility of the safety analysis, especially as it applies to the MOX option.

Transportation Safety and Security Issues Must Be Addressed

The DPEIS does not discuss the security arrangements for sea shipments of plutonium or MOX reactor fuel, which would be necessary if warhead-plutonium MOX fuel were fabricated in Europe. These arrangements may be included in the classified appendix on transportation.5 If so, some aspects of these arrangements should be made a part of the public record and subject to independent evaluation. Further, there is no discussion of transportation security arrangements with the government of Canada if CANDU reactors were used. These matters require clarification. The DPEIS needs to state publicly what level of security will be required for shipments of plutonium and MOX. This can be done without providing explicit details regarding armament, routing and scheduling that might prove useful to a potential adversary.

Appendix G compares transportation impacts for the different disposition alternatives. The analysis understates the environmental hazards of transporting radioactive material by embracing the Type B transport standards and assigning a low probability to an accident that could result in a breach of the Type B cask. The appendix ignores recent expert reports that challenge the adequacy of the Type B standards,6 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. Instead, the DPEIS relies on earlier reports to assert the adequacy of Type B containers. The DPEIS' 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.

We believe that all of the above issues must be thoroughly addressed for the PEIS to conform with NEPA requirements and provide an adequate basis for the Secretary's decision on long-term disposition of weapons-usable fissile materials.

If you would like further detail on the above points, please contact Steven Dolley of the Nuclear Control Institute at 202-822-8444.

Sincerely,

Paul Leventhal
Nuclear Control Institute

Christopher Paine
Natural Resources Defense Council

Daryl Kimball
Physicians for Social Responsibility

Jennifer Weeks
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Greenpeace International

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Nuclear Waste Citizens Coalition

Bill Magavern
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Kathryn Crandall
Women Strike for Peace

Michael Mariotte
Nuclear Information and Resource Service

End Notes

1. Committee on International Security and Arms Control, National Academy of Sciences, *Management and Disposition of Excess Weapons Plutonium*, 1994. Back to document

2. One study calculates that such a subsidy may run as high as six cents per kilowatt-hour, depending upon the utility and plants, equivalent to billions of dollars. GE Nuclear Energy, *Study of Plutonium Disposition Using Existing GE Advanced Boiling Water Reactors*, NEDO-32361, Prepared for the U.S. Department of Energy, June 1, 1994, p. 1.2-4. Back to document

3. "Comments on the Electrometallurgical Process," attachment to letter to Bill Danker, MD-1, from Leonard Gray, Task Leader, Fissile Materials Immobilization Task [sic], Fissile Materials Disposition Project, August 30, 1995; Gregory R. Choppin, et al., An Evaluation of the Electrometallurgical Approach for Treatment of Excess Weapons Plutonium, National Research Council, 1996. Back to document

4. Fissile Material Disposition Project, Lawrence Livermore National Laboratory, *Evolutionary/Advanced Light Water Reactor Data Report*, UCRL-ID-123411, February 9, 1996, Table 8-5, p. 8-14. Back to document

5. This classified appendix is mentioned on page 4-783 of the DPEIS, but a citation is not given and no further information is provided. Back to document

6. Illinois Institute of Technology Research Institute (IITRI), "Definition of Bounding Physical Tests Representative of Transport Accidents---Air and Marine," IITRI KO6019, November 1983; ECO Engineering, Inc., Annapolis, MD., "A Review of the Proposed Marine Transportation of Reprocessed Plutonium from Europe to Japan," March 1992; Edwin S. Lyman, Princeton University School of Engineering/Applied Sciences, "Safety Issues in the Sea Transport of Vitrified High-Level Radioactive Wastes to Japan," December 1994. Back to document

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