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August 30, 2002

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**SUBJECT: NCI COMMENTS ON THE REVISION OF THE NRC'S DRAFT EIS
ON THE PROPOSED MIXED OXIDE FUEL FABRICATION FACILITY TO
ACCOMMODATE PLUTONIUM DISPOSITION PROGRAM CHANGES**

The Nuclear Control Institute (NCI) has long been concerned about the Department of Energy's (DOE) management of the program to dispose of surplus warhead plutonium. This concern has been reinforced by the havoc DOE has recently caused by making major mid-course corrections to the program without careful consideration of the implications of these changes. As a result, millions of taxpayer dollars are being wasted and multi-year delays continue to occur in carrying out a program meant to address what the National Academy of Sciences called "a clear and present danger" in 1993 --- that is, nine years ago.

A case in point is DOE's adoption earlier this year of a "revised" plutonium disposition strategy, which eliminated one of the two technical approaches for disposition, the immobilization process, while at the same time proposing a more than 70% increase in the disposition rate. The cancellation of the immobilization program, which was to dispose of about one-quarter of the 34 MT of plutonium committed to under the September 2000 U.S.-Russian Plutonium Disposition Agreement, has raised even more troubling questions about the viability of the project. It has also forced the NRC to scrap the Draft Environmental Impact Statement (DEIS) on the proposed MOX Fuel Fabrication Facility (MFFF) that was nearly ready to be released, causing a one-year delay in NRC's NEPA process for the MFFF.

NRC also bears responsibility for the additional delay, labor and expense associated with a revision of the DEIS. DOE's intent to cancel the immobilization program was apparent as early as February 2001, when it announced that it was "suspending" the program for ten years or more. In comments on the scope of the

Strategies for stopping the spread and reversing the growth of nuclear arms.

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original DEIS, submitted in May 2001. NCI urged NRC to evaluate an alternative in which the immobilization program were cancelled.¹ NCI recommended that such an evaluation include an assessment of (1) the impacts on waste generation, worker dose and accident consequences of augmenting the MFFF polishing unit so that it is capable of preparing the impure plutonium previously intended for immobilization to render it suitable for processing into MOX fuel, and (2) the environmental impacts of the accommodation of more plutonium in the MOX track through increasing the plutonium loading per reactor, the irradiation time or the number of program reactors. NRC ignored these comments and analyzed only the scenario proposed by DCS in its first Environmental Report (ER). It should be apparent that had NRC evaluated other options like the one proposed by NCI, the year-long delay now needed to revise the DEIS could have been significantly shorter. NRC should keep in mind the benefits of thinking ahead when evaluating a program subject to arbitrary and abrupt changes in direction as it identifies the set of alternatives to be evaluated in the current revision of the DEIS.

1. Immobilization remains a "reasonable alternative" for plutonium disposition and must receive full evaluation in the NRC DEIS.

Immobilization of plutonium is demonstrably cheaper, faster, safer more secure and less of an environmental threat than the MOX approach. DOE itself has concluded that immobilization "achieves full disposition of 34 MT of U.S. plutonium inventory at the lowest cost."² The sole obstacle to implementation of this clearly superior technology is the political opposition of entrenched nuclear bureaucrats in both the U.S. and Russia, who favor reactor options on ideological grounds, no matter what the cost and risk.

However, one may expect that the merits of immobilization technology will be better appreciated by future administrations, both here and in Russia, especially once the technical difficulties and proliferation risks of implementing the MOX option become more widely recognized. Development of the technology was in an advanced state at the time of its cancellation, and it can be revived as rapidly as it was derailed. Thus immobilization remains a viable and a "reasonable" alternative that merits full consideration in the NRC DEIS.

2. The evaluation of the MOX option must consider the disposition of plutonium previously designated for immobilization that has been "stranded" by cancellation of the immobilization program.

Cancellation of the immobilization program has stranded at least two MT of plutonium of the 34 MT covered by the U.S.-Russian Agreement without a disposition path, since DOE has said that the material is too difficult to convert to a form suitable for MOX fabrication. In addition, at least 8 MT of weapon-usable plutonium previously

¹ F.S. Loman, "Nuclear Control Institute Comments On The Scope And Content Of The Nuclear Regulatory Commission Environmental Impact Statement For The Mixed Oxide Fuel Fabrication Facility," May 21, 2001. Available at www.nci.org.

² U.S. DOE, NNSA, *Report to Congress: Disposition of Surplus Defense Plutonium at Savannah River Site*, February 15, 2002, p 4-23.

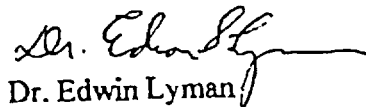
designated for immobilization but not covered by the U.S.-Russian Agreement has also been stranded. NRC must fully evaluate the environmental and security risks posed by this orphaned material in considering the MOX alternative.

3. The assessment of the MOX alternative must fully evaluate new information about the safety risks associated with the use of MOX fuel.

The additional public health and environmental risks posed by the substitution of MOX fuel for uranium fuel in light-water reactors have been well-documented,³ but have not been adequately considered in the DOE NEPA documentation to date on the U.S. plutonium disposition program. Furthermore, new information has recently come to light that suggests that the additional risks posed by MOX fuel compared to uranium fuel are even greater than previously assumed. During the recent NRC expert elicitation exercise on accident source terms from MOX fuel, some expert panel members were of the opinion that available experimental data indicates that "higher in-vessel releases (and faster rates of releases) are expected for MOX fuels as compared with LEU fuels."⁴ This observation, if validated, means that MOX source terms pose greater radiological risks than uranium source terms not only with respect to radionuclide inventories, but also with respect to the magnitude and timing of releases. In addition, the uncertainties in low-volatile release fractions associated with MOX fuel are very high as a result of a lack of experimental data. This information must be fully evaluated in the DEIS in considering the environmental impacts of the MOX alternative.

NRC has stated that it intends to consider the use of additional reactors in the MOX program to accommodate the increased rate of plutonium disposition called for in DOE's revised disposition strategy. However, NRC should realize that at least three additional reactors will be required to dispose of 3.5 MT of plutonium per year without an increase in the MOX core fraction above the 40% now planned, rather than the two reactors that DOE has said would be sufficient. Also, NRC must also consider the distinct possibility that DOE will not be able to locate any additional reactors willing to accept the costs and risks of MOX use. In such an eventuality, increased disposition rates could only be accomplished by increasing the MOX core fraction above 40% in the four Catawba and McGuire reactors already committed to the project. Any increase in the MOX core fraction will likely require physical modifications to be made to these reactors and will also be associated with additional safety and environmental impacts. These changes must be evaluated in the DEIS.

Sincerely,



Dr. Edwin Lyman
President

³ E. Lyman, Public Health Risks of Substituting Mixed-Oxide for Uranium Fuel in Pressurized-Water Reactors," *Science and Global Security* 9(1) 33-79.

⁴ U.S. NRC, "Accident Source Terms for Light-Water Nuclear Power Plants: High-Burnup and Mixed Oxide Fuels," draft, ERI/NRC 02-202, March 2002, p. 50.