



Comments on the Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement

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Comments of the Institute for Energy and Environmental Research (IEER) on the
Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement
(DOE/EIS-0283-DS, April 1999)

By Arjun Makhijani

28 June 1999

The Final EIS should include the features described in the comments below.

1. According to various statements of the Department of Energy (DOE) and its contractors, the proposed use of mixed oxide fuel to disposition surplus plutonium from the US nuclear weapons program is based on the experience of the use of MOX in European light water reactors (LWRs). The DOE should explicitly analyze reactor control, cost, and accident-probability and consequence issues with this in mind. It has not done so in the Draft Supplemental EIS. DOE should specify exactly what European experience it is relying on for making its decision on its MOX program, what reactors use MOX in Europe and how they correspond to the proposed reactors in the United States in terms of safety features, control rods, etc. DOE should make this European data public as part of its Final EIS. The DOE should provide a detailed comparison of the reactors of the proposed vendors Duke Power and Virginia Power with the French reactors in which MOX fuel is used in terms of their (i) safety features, (ii) control rod design and quantity as well as other reactor control features; (iii) design aspects related to emergency core cooling and containment of an accident. For instance, unlike some US reactors, the reactors in France's MOX program do not rely on ice condensers as a safety feature.

2. If DOE believes that the safety features of US and French and/or other European reactors are materially the same it should so state, and provide the justification for it. If the DOE is relying on French or European reactor safety experience and design features, it should justify this. In that case the DOE should make an explicit commitment that whatever safety issues come up in the in the future in the French or European MOX programs (respectively) would also be addressed in the US disposition program. The DOE should make a commitment to seek approval from the NRC about its assumptions regarding the similarities and differences in the safety and control features of the French reactors relative to the six reactors now proposed to be included in the MOX program as well as any reactors that might be added in the future.

3. The Final Supplemental EIS should state that the percentage of plutonium-239 in the core of the reactors proposed to be used in the disposition program will not exceed the typical conditions that have prevailed in the European MOX program and for which there is substantial experience. These levels are about 5 percent total plutonium content (all isotopes), using reactor grade plutonium, which has about 60 percent plutonium-239, a far lower fraction than weapons grade plutonium (about 94 percent). This restriction is necessary for safety reasons, since the proportion of delayed neutrons upon which reactor control depends is much lower for plutonium-239 fission than for uranium-235 fission. The table below shows two examples of how the restriction of equivalent plutonium-239 content in the core reduces the



percentage of weapons-grade plutonium that can be used in the MOX fuel of the disposition program.

	MOX Core loading fraction %	Pu-total in MOX %	Pu-239 core loading, %
Reactor grade MOX, France, typical	30	5.3	1.0
Weapons-grade MOX	30	3.4	1.0
Weapons-grade MOX	40	2.5	1.0

Note: Calculations are based on a plutonium-239 content of 60 percent for reactor-grade plutonium and 94 percent for weapons grade plutonium.

In the first example, for a 30 percent MOX fuel core loading in the disposition program, the weapons-grade plutonium content in MOX fuel would be restricted to 3.4 percent. For forty- percent core loading, it would be restricted to 2.5 percent plutonium. DOE should make these restrictions explicit in its Supplemental EIS. We note that although Electricite de France has asked for authorization to increase the total plutonium enrichment of reactor grade plutonium in MOX to about 7 percent, there is no substantial experience with this. This should not be used as the basis of the US disposition program. It would be contrary to repeated assurances that the US disposition program is based on extensive European experience.

4. The DOE should calculate the schedule and cost implications of the restrictions in the MOX loading and plutonium content as described above. It should specifically analyze at least the two examples in the table above.

5. The DOE should provide detailed safety justification for any increase in plutonium-239 content above one percent in the core (see table above). If the DOE's Record of Decision is to proceed with MOX (which IEER opposes), the DOE should require reactor operators to seek explicit license approval on this specific issue, besides other licensing issues. The DOE should factor in increased risks of reactor accidents for increases in plutonium-239 content beyond the typical European experience. The DOE should also provide a detailed analysis of the various scenarios it is proposing for the plutonium-239 content in reactor cores in the US disposition program relative to the European experience. This analysis should include details on what steps the DOE and its contractors plan to take to address safety issues if the plutonium-239 content of the MOX cores in the disposition programs is greater than has been the case in typical European experience.

6. Getting a disposition program in place in Russia is a central reason that has repeatedly been put forward to justify the MOX program in the United States. The use of MOX in Russian light water reactors is likely to have some US funding, since Russia insists that it will not carry out such a program without external funding, MOX use in Russia will also have non-proliferation consequences for the United States, especially given that, unlike the United States, Russia plans at some time in the future to reprocess MOX spent fuel. Further, some of the radioactive fallout from a severe accident in a Russian reactor using MOX, should one occur, may affect the United States, as did the fallout from the Chernobyl. Therefore, the Supplemental EIS should analyze the environmental consequences of MOX use in Russia.



Comments of Lisa Ledwidge, Institute for Energy and Environmental Research, at the U.S. Department of Energy public hearing on the supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement, June 15, 1999

My name is Lisa Ledwidge. I am the Outreach Coordinator at the Institute for Energy and Environmental Research, a non-profit organization in Takoma Park, Maryland. I coordinate a project that provides technical assistance to grassroots groups around the country on nuclear issues.

I have three questions and a comment for the Department of Energy (DOE) regarding the supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement.

1. When will the DOE grant the public access to the home-country environmental and public and worker health record of Cogema (the French company that is a member of the consortium that DOE contracted for mixed-oxide [MOX] fuel fabrication and irradiation)? The American people have a right to access this information on the same basis that DOE documents would be available to the public here in the U.S.
2. Who holds the liability for potential accidents with or failures of the MOX program in Russia? This question has not been addressed in any DOE public document as far as I am aware. However, it is a very important one, given the economic situation in Russia, the questionable safety status of Russian reactors, and the current or potential role of the US in financing or otherwise promoting the joint U.S.-Russian MOX disposition plan. This is an especially important question in light of the fact that the Russian MOX program will use light water reactors, a plan the Russian government is adopting at the urging of the U.S. Minatom (DOE's Russian counterpart) would actually prefer to use breeder reactors.
3. How does the DOE justify the militarization of civilian nuclear power plants in which it proposes to irradiate MOX fuel? (By militarization, I refer to the transportation and storage of MOX fuel, made with military plutonium, to and at commercial nuclear power plants. Some may think this too strong a term, but in reality what DOE is proposing to do is locate fuel made with military plutonium at civilian sites.) In addition, what provisions are planned for the significant change in status of civilian nuclear power plants to military or quasi-military sites, since they will at least temporarily be storing unirradiated MOX fuel which can, relatively readily, be converted to weapons-usable material?

One final comment. It is beyond my understanding why the DOE would deny, after repeated requests, public hearings in the communities around the North Anna, Catawba and McGuire reactors. The DOE has responded to this with something like, More than 80 hearings have been held on this EIS, and people can comment in other ways. If DOE has held 80 hearings, then why were not a few of them held in reactor communities? Alternatively, if DOE has held 80 hearings, how much trouble could have been three more?

I look forward to answers to these questions in the near future. Thank you very much for this opportunity to comment.

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