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May 6, 1996

U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, DC 200026-3786.

Subject: Comments on the Draft Programmatic Environment Impact Statement for the Disposition of Weapons-Usable Fissile Materials, dated February 1996.

Please accept the attached comments related to the disposition of weapons usable plutonium.

Yours Truly

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Due to the close of the comment period on Tuesday May 7, transmittal of our comments to the DOE will be via by FAX to 1-800-820-5156

cc: Lynn Wallis
Steve Hucik

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Storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement (February 1996) DOE/EIS-0229-D

Comments

Volume/Section/Page	Comments	
Summary-Abstract/ compared to S-7	The summary abstract conclusion, that the disposition of weapons usable Pu is necessary, is in conflict with a no action alternative. Considering the continuing threat of diversion of Russia's weapons usable plutonium, a near-term bilateral, reliable Pu disposition program would appear to be a highly necessary activity and therefore a no action alternative which would neglect the "clear and present danger" situation, should be entirely unacceptable. The PEIS also fails to adequately address 1) the sense of urgency which should be evaluated by the reliable timeliness of each alternative and 2) the environmental risk which a nuclear threat due to diverted material would represent. Further delay in embarking on a practical disposition program and failure of the chosen alternatives to reliably fulfill the mission would enable and enhance that threat.	1/08.03.01 2/01.00.00
Summary S -5	The PEIS describes international cooperation as a PEIS criteria but fails to give appropriate credibility to the furthering of international cooperation which bilateral reactor based programs in both the U.S. and Russia would provide. It has been publicly suggested by DOE personnel that the disposition programs in each country could be different, however a vitrification program which would leave the weapons usable Pu unchanged and readily recoverable by the industrial infrastructures available in either the U.S. or Russia, cannot be credible to either side. Equivalent programs in the two countries for the large quantities of pit Plutonium must contain an element of irreversibility which only the LWR option offers.	3/01.03.00
	The PEIS fails to give appropriate credit under both its timeliness and cost criteria of the industrial reliability and predictability of the existing LWR option; especially as compared to 1) the uncertainties in the R&D required for other options, 2) the technical, cost, and schedule uncertainties inherent in the prototype stage of other options, and 3) in the reliability and cost uncertainties of the mission production stage of the other options being considered.	4/08.03.01

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08 03 01 Comment Number 1

Analyses of the No Action Alternative are required by NEPA to serve as a baseline. As stated in Chapter 1 of the PEIS, the purpose of the Proposed Action is to provide safe, secure, and cost-effective storage for the nonsurplus weapons-usable fissile materials and for surplus Pu pending disposition, since the disposition process would take time. The intent is to conduct the disposition process until all surplus Pu materials are taken care of.

01 00 00 Comment Number 2

Timeliness is one of the criteria used in the screening process for selecting reasonable alternatives to be analyzed in the PEIS. The endpoint for each disposition alternative is to convert the surplus Pu into a proliferation-resistant form that meets the Spent Fuel Standard, as described in the PEIS.

01 03 00 Comment Number 3

As described in the PEIS, the endpoint for all disposition alternatives is to convert the surplus Pu into a proliferation-resistant form that meets the Spent Fuel Standard. Vitrification of Pu can meet this Standard since the Pu would be as unattractive and inaccessible as that in spent nuclear fuel. The United States and Russia currently have a joint program to assess the feasibility of all the reasonable disposition alternatives, including the use of Pu in LWRs.

08 03 01 Comment Number 4

The Department of Energy acknowledges the commentor's support for the Existing LWR Alternative. Decisions on disposition of weapons-usable fissile materials will be based upon environmental analyses, technical and economic studies, national policy considerations, and public input.

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Summary/Reactor Category/S-15	The statement "a dedicated facility would have to be built at a U.S. site to implement the reactor alternative" (MOX fuel fabrication facility) is considered somewhat misleading. MOX fabrication capabilities exist in Europe and could support the reactor alternative. The PEIS explains European capabilities in later sections and details the need for a U.S. capability. However, this paragraph is considered incorrect as written. It may be prudent for policy reasons to proceed with a MOX facility in the U.S. to assure a reliable, proliferation independent MOX fuel supply for a U.S. LWR program, but the decision to build MOX facility in the U.S. is more a political decision than one fully necessitated by the technology, logistics or the available infrastructure.	5/06.01.09
Summary/Existing Light Water Reactor Alternative/S-15	The first paragraph in this section states that a minimum of four (4) BWRs would be required for a Pu throughput of 2-3 t/yr. With optimized fuel and fuel cycle designs recently divulged to the DOE, this throughput can be achieved with two (2) existing BWRs utilizing full MOX cores or with three (3) existing BWRs utilizing a high Pu throughput (no burnable poisons in the MOX fuel rods) design. The PEIS timeliness and technological viability criteria should also consider that BWRs can operate with up to a full MOX core configuration without changes to the plant design, equipment, systems, or fuel bundle mechanical configuration. The capability for operation with MOX is achieved entirely through the design of the fuel pellet and core nuclear design. Systems operations and core and fuel bundle mechanical designs all remain unchanged. MOX cores for BWRs can also be designed within the operating envelope of the current UO_2 fuel design licensing criteria which sustains the existing margin to the licensing basis design limits for current fuel bundle designs. These considerations enable licensing of MOX fuel designs for BWRs and licensing of BWR plants for operation with MOX fuel to be implemented as straightforward, low technical risk activities. This approach has been the basis for MOX fuel designs and MOX fuel operation in BWRs since the onset of GE's Pu disposition evaluations. Modifications of mechanical, chemical, and control systems of pressurized water reactors (PWRs) were required in order to transition from UO_2 fuel to even the nominal 1/3 MOX core operating schemes being used in France. Where more challenging MOX operating cycles are being considered, PWR plants will require even further modifications and changes to reactor control and operating systems. DOE should NOT confuse the PWR requirement for control rod additions and soluble boron reactivity control systems changes as being applicable to BWRs as there are no such requirements for BWRs.	6/01.05.00 7/06.02.09

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06 01 09 Comment Number 5

Europe is moving toward a balance between the capacity to fabricate MOX fuel and the capacity to utilize MOX fuel in reactors. Additionally, Europe has excess separated Pu stores which they intend to use as MOX fuel as the fuel fabrication infrastructure and reactor infrastructure permits. Therefore, use of European reactors for consumption of U.S. Pu-source MOX fuel would merely displace the use of separated European Pu and result in no net reduction in world inventories of separated Pu. Hence, the statement that Europe has no excess MOX capacity. Additionally, facility utilization projections indicate that, while some excess MOX fuel fabrication capacity may exist in Europe for the next few years, current capacity is soon expected to be fully utilized for commercial MOX fabrication. Therefore, the United States may not be able to rely on the use of existing European MOX fabrication capacity for the entire disposition campaign. However, as a part of efforts to develop weapons-grade Pu MOX fuel, DOE is consulting with European Fuel Fabricators to benefit from their experience in MOX fuel fabrication and may have some MOX Lead Test Assemblies and/or initial core loads fabricated in Europe. Also, participation in the construction and operation of a MOX Fuel Fabrication Facility in the United States will be open to European fuel vendors.

01 05 00 Comment Number 6

The Technical Summary Report for disposition, made available to the public in July 1996, recognizes the fact that full MOX cores could be utilized for Pu disposition. The Final PEIS and Summary have been revised to incorporate this information.

06 02 09 Comment Number 7

The Technical Summary Report for disposition, made available to the public in July 1996, recognizes this information.

Summary/Attachment B/S-153	In the Existing Light Water Reactors Alternative (per single unit) column under Waste Management, it states that spent nuclear fuel generation would increase approximately 23 *t* for BWRs. If the BWR operating cycles and core management/outage philosophies are not changed with the introduction of MOX fuel, the amount of spent fuel generated should not increase.	8/09.11.08
Vol. I/1.2, 6th para./ 1-5	We consider the statement that the NAS has identified several disposition options to be misleading. The NAS report states that the "two most promising alternatives" are fabrication and use as fuel (spent fuel option) and vitrification. The third option, burial in deep boreholes, has been less thoroughly studied. Considering the delays and uncertainty surrounding the Yucca Mt. repository, the uncertainties associated with deep borehole burial might be even more uncertain and therefore the program schedule, cost, and technical risks of the deep borehole option would seem to make that option not a credible nor reliable near term option.	9/01.04.00
Vol. I/Table 2.4.5.1-1/2-123	The column "minimum 4 BWR" is incorrect (see similar comment above). The GE ABWR is not listed in the "Evolutionary Reactor Types". Information on the ABWR is provided in NEDO-32351 and the ABWR should be available as an evolutionary reactor option.	10/06.02.09
Vol. I/2.4.5.2, Facility Operations/2-126	Again, "four BWRs" should be changed to "three BWRs" for partial MOX cores or "two BWRs" for full MOX designs.	
Vol. I/Table 2.4.5.2-1/2-129	Given the same fuel cycles as for LEU fuel, MOX cores should not generate additional spent fuel assemblies (as compared to typical LEU cores).	
Vol. I/Table 2.5-2a/ 2-255	If core management philosophy is unchanged, spent nuclear fuel generation would NOT increase by the 23 *t* for BWRs. DOE's assertion does not appear justified.	8/09.11.08 cont.
Vol. II/4.3.5.2.10, 3rd para./4-692	DOE appears incorrect in concluding that the number of discharged fuel bundles is higher for a MOX core than the typical LEU core. This paragraph raises the concern of increased waste and storage requirements for MOX fueled reactors that can be considered neither accurate nor justified.	
Vol. II/4.3.5.5/4-769	This paragraph might infer that there are CANDU reactors within the United States.	11/16.00.00

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09 11 08 **Comment Number 8**

MOX fuel used in the Existing LWR would remain in the reactor until sufficient burnup is achieved to meet the Spent Fuel Standard. This would be shorter than conventional uranium fuel cycles which remain in the reactor to achieve full economic value. MOX fuel will be withdrawn before full burnup is achieved and therefore more spent fuel will be generated. This assumption was used in order to bound the impacts for spent fuel generation and storage. It also would dispose of the excess weapons-usable fissile materials as quickly as possible. If the core management philosophy is different from the assumption used in the PEIS, as noted by the commentor, the resultant environmental impacts would be less. The facility operations section of Chapter 2 of the Final PEIS for the Reactor Alternatives acknowledges that there would be a range in the amount of MOX throughput dependant upon the reactor types and fuel management.

01 04 00 **Comment Number 9**

Comment noted.

06 02 09 **Comment Number 10**

The PEIS has been changed to reflect that 3 to 5 LWRs would be required to accomplish the mission in approximately 25 years and starting up in 10 to 12 years. The Technical Summary Report issued by DOE in July 1996 provides more details.

16 00 00 **Comment Number 11**

Comment noted. Text was changed to improve clarity.

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Vol. III/H.4/H-7	The GE Advanced Boiling Water Reactor is designed for MOX fuels, and therefore should be included in this discussion. The PWR discussion in Section H.5 includes all three LWR options.	12/06.04.08
Vol. III/H.4.1/H-7	Dependent upon the DOE decision to pursue partial or full MOX cores, less than four (4) BWRs can accommodate this mission.	10/06.02.09 cont.
Vol. III/H.4.3/H-8	The figures referenced in the paragraphs on criticality and thermal are reversed.	13/16.00.00
Vol. III/App. N, 4th para./N-1	This is a confusing paragraph since BWR fuel designs also use burnable poison rods.	14/06.00.08

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06 04 08 Comment Number 12

Section H.4 addresses the existing and partially completed LWRs and Section H.5 addresses the existing, partially completed, and evolutionary LWRs. The General Electric (GE) evolutionary LWR was not addressed in the PEIS but would give comparable results. Additional analyses on the spent nuclear fuel disposition would be completed if the Evolutionary LWR Alternative is selected.

16 00 00 Comment Number 13

The commentor is correct. The figures referenced in Appendix H were changed for the Final PEIS. A consistency check was performed on the Final PEIS as a part of the Quality Assurance Procedure.

06 00 08 Comment Number 14

The paragraph in Appendix N has been revised in the Final PEIS for clarity.