

Mr. Peter Hastings
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P.O. Box 31847
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SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION STAFF REVIEW OF THE U.S.
DEPARTMENT OF ENERGY SURPLUS PLUTONIUM DISPOSITION FINAL
ENVIRONMENTAL IMPACT STATEMENT

Dear Mr. Hastings:

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed portions of the U.S. Department of Energy (DOE) Surplus Plutonium Disposition (SPD) Final Environmental Impact Statement (FEIS). The staff review focused on the mixed oxide (MOX) fuel fabrication facility (FFF) and no action alternative sections of the SPD FEIS. The review was intended to determine how much of the FEIS might be used to develop an EIS for the MOX FFF license process, and to determine if any areas need more information. The NRC staff met with Duke, COGEMA, Stone and Webster (DCS) and DOE on March 23, 2000, to discuss the results of the review. The meeting was open to the public. The NRC's comments on the DOE SPD FEIS are provided as Enclosure 1. These comments are designed to convey to DCS the results of the NRC review as DCS develops an environmental report (ER) to accompany the MOX FFF license application. They represent areas where NRC recommends that DCS update or supplement DOE's FEIS if DCS plans to adopt the FEIS in part or whole as its ER. The enclosed comments provide general direction regarding many of the issues that may arise in the preparation of the DCS ER. However, given that the NRC has not conducted public scoping for the EIS, and has not otherwise fully analyzed the issues involved with the environmental impacts associated with the MOX FFF, the staff has not reached firm conclusions regarding the scope and content of the environmental analysis at this early stage of the process.

The enclosed comments are limited in scope and are not intended to represent a complete review of the DOE SPD FEIS, such as might be submitted to the DOE in response to a request for comments on the FEIS. The NRC staff review of the FEIS was, in essence, a "completeness review" to confirm that the FEIS provided information in the areas of concern, but did not verify the adequacy of that information. Some areas were reviewed in greater detail as reflected in the enclosed comments. The NRC does not plan to review the FEIS any further; however, if DCS has specific questions for the NRC regarding DOE's FEIS, the NRC will examine those issues.

Formal review of DCS's ER will be based on 10 CFR Part 51, the "Standard Review Plan for the Review of an Application for a Mixed Oxide (MOX) Fuel Fabrication Facility" (NUREG-1718, Draft), the "Standard Review Plans for Environmental Reviews for Nuclear Power Plants" (NUREG-1555), and NMSS Policy and Procedures Letter 1-50, Rev. 2, "Environmental Justice in NEPA Documents" (Enclosure 2). Note also that the NRC staff has typically compared assumptions and results of transportation risks to values accepted by NRC in NUREG-0170,

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"Final Environmental Impact Statement on the Transportation of Radioactive Material by Air and Other Modes."

If you have any questions, please contact Mr. Andrew Persinko on (301) 415-6522.

Sincerely,

Melanie A. Galloway, Chief
Enrichment Section
Special Projects Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket: 70-3098

Enclosures:

1. General Comments on the DOE Surplus
Plutonium Disposition Final Environmental
Impact Statement
2. NMSS Policy and Procedures Letter 1-50,
Rev. 2, "Environmental Justice in NEPA
Documents"

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* See Previous Concurrence

OFC	URLL		URLL		URLL		OGC		
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ENCLOSURE ONE

GENERAL COMMENTS ON THE
DOE SURPLUS PLUTONIUM DISPOSITION
FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR APPLICATION TO THE MIXED OXIDE
FUEL FABRICATION FACILITY

A. DESCRIPTION AND ANALYSIS OF ALTERNATIVES

1. The U.S. Department of Energy (DOE) Surplus Plutonium Disposition (SPD) Final Environmental Impact Statement (FEIS) examines 12 separate alternatives (see Table 2-1 on FEIS Page 2-3). These alternatives, and any other reasonable alternatives identified by Duke Cogema Stone & Webster (DCS), need to be discussed in the environmental report (ER). The NRC recognizes that, since DOE has issued a Record of Decision, it is likely that many of these alternatives are now considered impractical. The U.S. Nuclear Regulatory Commission (NRC) needs to ensure that all reasonable alternatives receive due consideration in order to meet its obligations under the National Environmental Policy Act process. Therefore DCS needs to identify those alternatives that do not appear reasonable for detailed consideration, along with the basis for drawing such conclusions. The ER can provide less detailed discussion of unlikely alternatives and/or reference the information provided in the FEIS.

Reasonable alternatives that will be fully addressed in the ER should, of course, be thoroughly documented. In weighing the alternatives, DCS need go no further than to establish whether or not substantially better alternatives are likely to be available. Finally, note that the public scoping process may identify additional alternatives for the NRC Environmental Impact Statement (EIS) on this action.

2. Title 10 CFR 51.45(c) requires that "the environmental report shall include an analysis that considers and balances the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and alternatives available for reducing or avoiding adverse environmental effects.... [T]he analysis in the environmental report should also include consideration of the economic, technical and other benefits and costs of the proposed action and of alternatives." The potential impacts (or benefits) need to be considered in conjunction with the available mitigation measures. The analysis must quantify the factors used for the analyses to the extent possible. The NRC recognizes that the DCS ER may contain different alternatives than those presented in the FEIS. Nevertheless, the FEIS could have provided additional information regarding the rationale for choosing Alternative 3 ("All Facilities at SRS [Savannah River Site]"). Therefore DCS needs to develop its own analysis as part of the ER to ensure an adequate comparison of the proposed action and alternatives tailored to the mixed oxide (MOX) fuel fabrication facility (FFF).
3. The DCS ER needs to evaluate and compare the planned shipments with the shipments for MOX fuel that are identified in NUREG-0170, "Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes." It also needs to assess whether the shipments described in NUREG-0170 are consistent with and applicable to the shipments proposed for the MOX facility. NRC staff has typically compared the assumptions and results of transportation risks to those values accepted by the NRC in NUREG-0170.

4. As part of the proposed action, the ER needs to define and describe deactivation and decommissioning (see FEIS Section 4.31). Deactivation and decommissioning are integral to the life-cycle of DCS's NRC license. They need to at least roughly be quantified and the impacts analyzed. To the extent possible, deactivation and decommissioning need to be included with the environmental impacts.
5. Cost-Benefit Analysis
 - a. The regulation at 10 CFR 51.45(c) quoted in Comment A.2 above mentions "benefits and costs of the proposed action and of alternatives." A cost-benefit analysis specific to the MOX FFF needs to be included in, or provided as a reference to, the ER. The NRC recognizes that the main benefits are qualitative in nature, not quantitative. Part 51.45 states that, "[t]he analyses for environmental reports shall, to the fullest extent practicable, quantify the various factors considered. To the extent that there are important qualitative considerations or factors that cannot be quantified, those considerations or factors shall be discussed in qualitative terms." Some guidance for preparing cost-benefit analyses is available in NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants." This guidance has been prepared by the Office of Nuclear Reactor Regulation and applies to power reactor licensing, but DCS may find the general information helpful. While NRC's fundamental responsibility is to determine whether the issuance of the license is acceptable from the standpoint of public health and safety, the analysis in the ER needs to include a discussion which weighs the various costs and benefits of the proposed action and reasonable alternatives in order to provide perspective on the decision-making process. In performing the analyses, DCS needs to identify whether any alternatives that are substantially better than the preferred alternative are likely to be available.
 - b. The life-cycle cost document¹ prepared by DOE includes a credit for the value of the MOX fuel that would be provided to the participating reactors, but does not consider the cost/loss of profit to normal suppliers of commercial low-enriched uranium (LEU) fuel from LEU fuel that the utilities would not have to purchase. This impact needs to be included in the cost-benefit analysis.
6. DOE considered reactors and depleted UO₂ separate from the MOX FFF analysis. Such an approach, when applied to the context of the proposed facility, can provide incomplete information, especially when considering the indirect effects of the action. In analyzing the environmental impacts of a proposed action, NRC generally considers the direct and indirect environmental impacts of the action when appropriate. In the case of the MOX facility, possible indirect effects that may warrant attention include reactor use effects, depleted UO₂ transportation to the MOX FFF, and shipment of MOX fuel. The level of analysis for the indirect effects considered should reflect the uncertainty involved in predicting future actions, the fact that these impacts will likely be considered in other licensing actions, and the fact that such impacts are not a direct, immediate impact of the proposed action.

¹ "Plutonium Disposition Life Cycle Costs and Cost-Related Comment Resolution Document," US DOE Office of Fissile Materials Disposition, November 1999.

7. Cumulative Impacts and Indirect Effects

- a. The FEIS analyzes Alternative 3 as the bounding alternative for cumulative impacts (see FEIS Section 4.32.4). It might be more appropriate for the ER to compare Alternative 3 to Alternative 12 to evaluate the indirect effects of licensing the MOX facility. The analysis needs to look at the past, present, and future impacts of the facilities. For example, deactivation and decommissioning, although not considered in detail as part of this FEIS, need to be considered as they could result in reasonably foreseeable future impacts.
- b. It would facilitate NRC's review if the cumulative analysis broke out the past and current impacts from the reasonably foreseeable future impacts. It would also be helpful to NRC if past, present, and future impacts were tabulated or summarized, rather than providing references to previous or on-going analyses (see Table 4-235 on Page 4-375). NRC staff agrees with the Environmental Protection Agency's Comment 16 (see Page 3-51 in Volume III, Part A to the FEIS), which recommends an enhanced cumulative impacts analysis.

B. UPDATE (Information related to this topic has changed since DOE published the FEIS)

1. It is unclear whether DOE's FEIS bounds DCS's design. DCS needs to either update the alternative descriptions and impacts to reflect the current design, or provide an analysis that shows why the FEIS impacts do bound the current design. The NRC's review would be facilitated if DCS includes facility data and assumptions within the ER to allow NRC to review calculations without having to consult multiple reference documents.
2. The MOX facility footprint, facility design, process descriptions, and other facility data need to be updated so that they are consistent with the current facility design. For example, the footprint of the facility changed between the draft and final FEIS (Section 2.4.3, Page 2-30), and Figures 2-14 and 2-15 do not include the aqueous polishing process as part of the facility lay-out. To facilitate NRC's review, information presented in the ER should parallel the information presented to support construction approval review.
3. As part of the proposed action, the ER needs to update information on the source of depleted uranium oxide including the supplier and the FFF (see FEIS Section 4.30.3, Page 4-367).
4. DCS needs to incorporate site specific information (e.g., F-area on the Savannah River Site) into the environmental report (ER). When compared to the FEIS, the ER needs to provide updated information where more current data are available. For example, much of the baseline data for waste generation, air quality, and socioeconomics dates from 5 to 10 years ago. In some cases, more recent information (e.g., the Savannah River Site Environmental Reports) is readily available. In addition, if Fish and Wildlife Services information has not been reassessed (with regard to endangered and threatened species) within the past few years, this information will also need to be updated.

5. DCS must update the environmental impacts presented in the FEIS (e.g., worker dose, public dose, etc.) so that these impacts accurately reflect the current MOX facility design information. In addition, the ER needs to contain supporting information that is sufficient to allow NRC staff to independently verify the calculated consequences. For example, for normal operations, such data may include stack location(s), stack height(s), effluent mass and volumetric flow rate(s), effluent treatment with decontamination factors, effluent temperatures, source terms, assumptions used in the calculations, or other pertinent information.
6. Table L-1 in the FEIS shows the number of MOX fuel assembly shipments as 830. Section L.3.1.3 states that the number of fuel assemblies per package is 4 for pressurized water reactors (PWR) and 8 for boiling water reactors (BWR). However, the conceptual package design presented to NRC (12/99) has a capacity of 3 PWR fuel assemblies. The DCS ER needs to reevaluate the change in estimated impacts, if any, from the difference in package capacity.

C. CLARIFY/PROVIDE BASIS (The basis for the data or statement is not clear in the FEIS)

1. The bases for many of the quantitative impacts presented in the FEIS are unclear. In many cases it appears that it would be difficult or impossible to independently duplicate the calculations due to lack of information or because MOX FFF impacts are combined with other impacts. Some areas where this was noted include waste management impacts, air quality, and radiation impacts. Data specific to the MOX FFF must be presented to the extent possible. This data needs to be presented in enough detail to permit the reviewers to perform independent analyses. Specific examples are listed below in Comments C.2 through C.8.
2. The ER needs to clearly indicate the proposed controlled area boundary for the MOX facility. The ER needs to state if, for the purposes of accidents, individuals in the controlled area will be treated as workers or as members of the public, consistent with the material submitted to support construction approval review.
3. The ER needs to include clear maps providing detail on the location of surrounding towns, cities, the location of the MOX facility in relationship to the established facilities in F-area and the proposed new surplus plutonium disposition facilities in F-Area. For example, the potential national historic preservation sites and the break-out between previously disturbed and freshly disturbed acreage could be shown on a map.
4. The discussion on Page 4-24 of the FEIS, with respect to accidents involving storage of Pu pits that could result in releases of Pu impacting noninvolved workers and the offsite population, states that the maximum consequences would be from a beyond design basis earthquake. If DCS chooses the same no action alternative as that used in the DOE FEIS, the ER must state the basis for concluding that this is the limiting accident and how DCS determined the risk from this accident.
5. The discussion on Page 4-60 of the FEIS, with respect to the public, states that the most severe consequences of a design basis accident for the pit conversion facility would be associated with a tritium release, and for the MOX facility, it would be a criticality. DCS needs to provide the basis for concluding that criticality is the controlling accident scenario, given the distances from the MOX facility to the controlled area

boundary at the Savannah River site, and not some other accident with energy to disperse material, such as a fire or a tornado or an earthquake. DCS must then explain how the risk was determined.

6. Similarly, with respect to the noninvolved worker, DCS needs to show how the risk was determined. (See Comment C.4 above.)
7. Footnote 4 on Page 2-13 of the FEIS states that "the physical protection and safeguards and security for the MOX facility would be acceptable to NRC." DCS must provide a basis for this statement, or further discussion of physical protection, safeguards and security in the ER.
8. Waste generation estimates should be based on information from similar operations at COGEMA; it is unclear how the quantitative transuranic waste, low-level waste and hazardous waste generation estimates were determined in Sections 4.4.2.2 and H.4.2.3.2.

D. MOX FFF SPECIFIC (The impacts/data associated with the FFF were combined with other facilities in the FEIS)

1. The DOE FEIS did not present impacts associated with the MOX FFF alone. The DCS ER needs to analyze impacts due solely to the MOX FFF. Specific examples are listed in Comments D.2 through D.4 below. See also Comment C.1 above.
2. NRC has generally reviewed the transportation sections associated with Alternative 3 in the DOE FEIS. The completeness review indicates that the DOE FEIS contains transportation impact information that is consistent and acceptable for use in an ER. However, an in-depth staff review cannot begin until the transportation risks are tailored toward those associated with the MOX FFF alone. Section 4.4.2.6 of the DOE FEIS currently integrates the risk from all transportation activities for Alternative 3, including shipments for the pit disassembly facility, the MOX Facility, and the immobilization facility. The MOX facility ER needs to consider individual transportation risks from feed shipments, waste shipments, and fresh MOX fuel shipments.
3. It would facilitate NRC review if DCS provided a table, similar to Tables 4-43 through 4-46 in the FEIS, showing the accidents and associated values, including values to the involved workers, specific to the MOX facility. The terms, "unlikely" and "extremely unlikely" used in Tables 4-43 through 4-46 should be defined in terms of probabilities, and the bases for the information in the tables must be provided. (Tables 4-43 through 4-46 show accidents and associated total values for pit conversion, MOX new construction, and immobilization, without differentiation as to the specific facility.)
4. Section L.6.4 of the FEIS discusses waste shipments generically, and Table L-1 of the FEIS does not include waste shipments from the MOX FFF. The DCS ER needs to provide an evaluation of the waste shipments from the MOX FFF, and confirm that the assessment in Section L.6.4 is applicable to the operation of the MOX FFF under Alternative 3 of the FEIS.

E. NRC POLICY/REGULATIONS (Information/analysis is required)

1. Environmental Justice: the demographic data presented in Figure 3-30 (percent of minorities within 50 miles of the Savannah River site) covers too large an area to identify minority or low-income communities near the site. An analysis of demographic data needs to be presented at the block group level in a table that compares the percent of minority and low-income populations in each block group to the State and County levels. A copy of the guidance used by the Office of Nuclear Material Safety and Safeguards on conducting environmental justice reviews is provided as Enclosure 2 to the cover letter.
2. The ER must include a complete cultural evaluation of historic and archaeological sites.
3. The ER needs to describe environmental monitoring measures (for example, sampling air, surface- and ground-water, wildlife, soil, vegetation or radioactivity) for background measurements and during construction and operation. Indicate monitoring required by other government agencies (for example, the Environmental Protection Agency).
4. The ER needs to clearly indicate where mitigation measures are used to ameliorate or minimize environmental impacts. For example, it appears that each accident sequence analyzed in the FEIS is mitigated (e.g., the HEPA filters are never by-passed or fail, the building retains containment integrity except in the beyond-design basis scenario, etc.). Similarly, it is difficult to evaluate the mitigation measures for any potential impacts to a national historic preservation site since the potential sites at F-area are not identified in relationship to the MOX facility.
5. The ER needs to include an appropriate description of permitting and compliance. In accordance with 10 CFR 51.45(d), the ER must list all permits, licenses, approvals, and other entitlements that must be obtained in connection with the proposed action and must provide the status of compliance.

F. OTHER

1. With respect to the maximally exposed involved worker, DCS needs to state the dose expected for the controlling accident and needs to state the latent cancer fatality probability associated with the consequences of the controlling accident.
2. Consequence and likelihood values of various accidents analyzed in the Integrated Safety Analysis, when completed, must be shown to be bounded by EIS and ER analyses.
3. The ER needs to present bounding accidents that are consistent with the accident analysis in the material submitted to support construction approval review.

ENCLOSURE TWO

Environmental Justice in NEPA Documents