June 8, 2001

MEMORANDUM TO: Thomas H. Essig, Chief
Environmental Branch
Division of Waste Management

FROM: Eric J. Leeds, Chief /RA/
Special Projects Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS

SUBJECT: COMMENTS ON MIXED OXIDE FUEL FABRICATION FACILITY ENVIRONMENTAL REPORT

We reviewed the Environmental Report submitted by Duke Cogema Stone & Webster for the proposed mixed oxide fuel fabrication facility at the Savannah River Site. Attached are our requests for additional information for your consideration.

Docket 70-3098

Attachment: Comments on Environmental Report

cc: Mr. Peter Hastings, DCS
Mr. James Johnson, DOE
Mr. Henry Potter, SC Dept. of H&EC
Mr. John T. Conway, DNFSB
Mr. Donald Moniak, BREDL
Ms. Edna Foster
Ms. Ruth Thomas, Environmentalists, Inc.
Ms. Glenn Carroll, GANE

Comments on the Mixed Oxide Fuel Fabrication Facility
Environmental Report

Section 3.1.1, 1st Para., p. 3-2

Confirm if UCNI will or will not be used in the MOX licensing review.

The Environmental Report (ER) refers to Unclassified Controlled Nuclear Information (UCNI). It is our understanding that UCNI will not be applicable to the mixed oxide (MOX) fuel fabrication facility (MFFF) licensing review.

Section 3.2.1, pp. 3-7 thru 3-8

Provide the environmental impacts from the processing, handling, storage, and disposition of U-235 produced in the aqueous polishing process.

Under 10 CFR 51.45(b)(1), the applicant's ER must address the impact of the proposed action on the environment. The ER provides no discussion on processing, handling, storage, and disposition of U-235 that will be produced in the aqueous polishing step. U-235 is a decay product of Pu-239. While it is present in low concentrations, a significant quantity could be produced in the polishing of the 25.6 MT of surplus plutonium.

Section 3.2.1, pp. 3-7 thru 3-8

Provide a discussion of the environmental impacts of the dry processing alternatives for removing impurities from the plutonium feedstock.

Under 10 CFR 51.45(b)(3), the ER must contain alternatives to the proposed action. The applicant's ER discusses the aqueous polishing process for removing impurities from the plutonium feedstock. However, the ER provides no discussion of the dry process alternative developed by Los Alamos National Laboratory for removing gallium impurities.

Sections 3.2.4 and 3.2.5, pp. 3-11 thru 3-14; Section 5.2.10, pp. 5-15 thru 5-20; Section 5.5.2.2, pp. 5-29 thru 5-40, and Section 5.7.3.6. p. 5-53

Present a complete evaluation of the environmental impacts of using sand filters in the confinement system as an alternative to the proposed action. The impacts should include a full life-cycle cost analysis.

Under 10 CFR 51.45(b)(3), the applicant's ER must contain alternatives to the proposed action. The confinement systems are based on the use of high efficiency particulate air (HEPA) filters. A cursory discussion of the sand filter option is presented in Section 5.7.3.6, but this discussion lacks details of the environmental impacts during routine operations and during accidents. For example, in certain fire accidents, the use of a sand filter may reduce releases of radioactive materials. In addition, sand filters would generally not need replacement over the life of the MFFF, minimizing the impacts associated with periodic replacement of HEPA filters.

Attachment

Section 3.3, pp. 3-14 thru 3-19; Section 4.13, pp. 4-39 thru 4-42; Section 5.2.12, p. 5-20

Describe how wastes generated by the MFFF will be processed. Provide information on the applicable environmental impacts from the processing, effluent releases, storage, and disposal operations applicable to solid transuranic wastes and the liquid high alpha waste stream.

Under 10 CFR 51.45(b)(1), the applicant's ER must address the impact of the proposed action on the environment. The ER indicates that liquid and solid wastes will be transferred to the Department of Energy (DOE) for processing and management. The ER also provides general information regarding how DOE manages its waste streams, but provides no specific information on how MFFF wastes will be processed or managed. Although waste processing will not be a part of the Duke Cogema Stone & Webster (DCS) operations, it will produce environmental impacts that need to be considered in the Environmental Impact Statement (EIS).

Section 4.1.1, p. 4-1

In the first paragraph of Section 4.1.1, revise the description of public access to the Savannah River Site area to include the fact that the U.S. Nuclear Regulatory Commission (NRC) considers Savannah River Site workers who are not closely and frequently connected to the licensed activity and who are outside the MFFF restricted area and within the controlled area boundary to be "members of the public."

The NRC's policy on delineating members of the public in controlled areas is described in NRC Staff Requirements Memorandum SECY-98-038, "Hanford Tank Waste Remediation System Privatization Co-located Worker Standards."

Section 4.1.1, p. 4-1 and Figure 4.2

Revise the description of the controlled area boundary to include only those areas to which DCS can limit access for any reason.

Section 70.61(f) states that each licensee must establish a controlled area for which they retain the authority to exclude or remove personnel and property. The area that is defined by DCS in Section 4.1.1 includes areas within the Savannah River Site that the DOE does not currently control access by physical structures, such as gates, barriers or fences. This includes, for example, the area north of South Carolina Route 278 and the area southwest of South Carolina Route 125.

Section 4.4.3.3, pp. 4-18 thru 4-19

Describe any groundwater monitoring results, applicable to the existing proposed MFFF site, for radioactivity and hazardous chemicals, the location of monitoring wells, and the depth to well screens. Results should include data that are above and below Environmental Protection Agency Safe Drinking Water limits. Address any new understandings of the groundwater hydrology in the vicinity of the proposed MFFF. Address any predicted impacts from the remediated seepage basin.

The ER states that there is no known soil or groundwater contamination on the MFFF site. Recent groundwater monitoring associated with a remediated seepage basin adjacent to the planned site indicate there may be groundwater contamination at the proposed site. The preliminary results also have raised questions about the understanding of the groundwater hydrology in the local vicinity of the proposed MFFF.

Section 4.11, p. 4-38; Table 4-25, p. 4-110

With regard to the actual average Savannah River Site radiation worker total effective dose equivalent from normal operations of 156 mrem per year that appears in Table 4-25, clarify whether this dose is from external radiation sources only or from both external and internal sources.

The reference for the 156 mrem per year value that appears in Table 4-25 is the Savannah River Site External Dosimetry Technical Basis Manual. Therefore, it is not clear that the 156 mrem per year value includes the Savannah River Site radiation worker annual average 50-year committed effective dose equivalent from internally deposited radionuclides.

Section 5.3, pp. 5-20 to 5-25

Discuss reasonable decommissioning options for the facility and the resultant environmental impacts assuming that DOE does not reuse the facility.

Under 10 CFR 51.45(b)(1), the applicant's ER must address the impact of the proposed action on the environment. The ER indicates that because DCS will deactivate the MFFF at the end of its operations and return the facility to DOE, no meaningful decommissioning impacts can be assessed. Even though DCS will not be performing decommissioning activities, there will be decommissioning impacts for the facility.

Section 5.4.1, p. 5-25

Discuss the impacts from feedstock movements from the DOE Pit Dismantlement and Conversion Facility to the MFFF.

Under 10 CFR 51.45(b)(1), the applicant's ER must address the impact of the proposed action on the environment. The ER states that there will be no need to consider additional environmental impacts associated with plutonium feedstock movement to the MFFF from the DOE Pit Dismantlement and Conversion Facility.

Section 5.5, p. 5-29 thru 5-40

Provide a basis for the selection of the evaluated scenarios as being the bounding accident events.

The accident analyses in the ER are presented at a very general level. There is minimal discussion to show that the results presented will bound the impacts. For example, it is unclear why the bounding internal fire is a fire in the PuO_2 Buffer Storage Unit or the bounding explosion is an explosion in the aqueous polishing cell.

Appendix D, Section D.2, p. D-5

Compare calculations of dose to site workers to NRC dose standards for members of the public.

The NRC's policy on delineating members of the public in controlled areas is described in NRC Staff Requirements Memorandum SECY-98-038, "Hanford Tank Waste Remediation System Privatization Co-located Worker Standards." DB

Appendix F, Section F.1.4, p. F-4

Contrary to what is stated in the last paragraph of Section F.1.4, evaluate whether inventories of soluble chemical compounds of plutonium (such as plutonium nitrate) would result in the bounding accident scenarios.

The doses from soluble plutonium are generally more limiting than doses from insoluble forms.

Appendix F, Section F.1.6, p. F-6

Clarify the choice of $6x10^{-4}$ as the respirable release fraction (ARF x RF) for the bounding accident consequence assessment in Section F.1.6.

Section F.1.6 describes a bounding consequence assessment in which the respirable release fraction (ARF x RF) is $6x10^{-4}$. However, the reference for this value (NUREG/CR-6410, "Nuclear Fuel Cycle Facility Accident Analysis Handbook") cites an ARF = $6x10^{-3}$ and an RF = 0.01 for solid, noncombustible powders exposed to thermal stress (i.e., an ARF x RF = $6x10^{-5}$).

Appendix F, Section F.5, F-6

Justify the use of a leak path factor of 1E-04 for ventilation filtration system under accident conditions.

In the ER, the ventilation filtration system is assumed to operate and mitigate releases of radioactive material following accidents. The ER states that the leak path factor for two banks of HEPA filters is assumed to be 1E-04. The basis for this assumption is not presented. NRC guidance in "Nuclear Fuel Cycle Facility Accident Analysis Handbook," NUREG/CR-6410, recommends that removal efficiencies of 99 percent to 95 percent be used of a series of HEPA filters that are not protected by prefilters, sprinklers, and demisters under severe accident conditions.

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