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Subject: Docket Number 070-03098
Duke Cogema Stone & Webster
Mixed Oxide Fuel Fabrication Facility
Evaluation of the Draft Safety Evaluation Report (DSER) on Construction of a Mixed Oxide Fuel Fabrication Facility

Reference: (1) Robert C. Pierson (NRC) letter to Robert H. Ihde (DCS) dated April 30, 2002, *Draft Safety Evaluation Report on Construction of Proposed Mixed Oxide Fuel Fabrication Facility*

(2) A. Persinko (NRC) letter to P. S. Hastings (DCS) dated June 27, 2002, *Evaluation of Duke Cogema Stone & Webster's April 23, 2002 letter*

Duke Cogema Stone & Webster (DCS) has reviewed the Draft Safety Evaluation Report (DSER) transmitted to DCS 30 April 2002 (Reference 1) for technical accuracy. In addition, DCS has taken into consideration the letter transmitted 27 June 2002 (Reference 2) where possible. DCS appreciates the opportunity to review the draft, and the release of the draft in advance of pending changes to the CAR (i.e., to incorporate alternate feedstock). DCS finds in general that the review of the CAR was comprehensive and concurs with most of the open items indicated in Appendix A of the DSER.

As a result of this review, however, in addition to the technical comments provided in Enclosure 1, DCS continues to be concerned with the apparent disparity in the level of detail requested by the Staff from one chapter to the next for construction authorization. DCS believes a series of face-to-face meetings (public meetings and onsite reviews) are needed to facilitate resolution of issues in some key areas. With regard to onsite reviews, DCS believes that additional documents available for onsite review would assist the Staff in their review of information previously submitted, particularly in the areas of criticality and chemical safety. DCS also believes this approach in consistent with the Commission's intent in establishing the requirements for an ISA Summary supported by an ISA maintained by the licensee onsite and available for NRC review.

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It should be noted that Enclosure 1 is not a comprehensive list; but rather contains representative examples of items found within the DSER. Additional discrepancies may be identified as part of ongoing review of the DSER, discussions with Staff, and closure of open items. DCS also has included in Enclosure 1 some selected responses to open items identified in the DSER, and a set of editorial comments identified during the review.

If you have any questions, or need additional information please call me at (704) 373-7820.

Sincerely,

Peter S. Hastings, P.E.
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Enclosure: DCS Comments on the Draft SER

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DCS Comments on Draft SER

Section 1.3, Site Description

Open Item Resolution

1-1. Sections 1.3.1.2, pg 1.3-3 and 1.3.2, pg 1.3-17 of the DSER indicate that the demography should be updated with 2000 census data as part of the license application. (Note that this item is not included in the Open Item list in Appendix A.)

In the ER and CAR, DCS used the SRS Generic Safety Analysis Report (GSAR, WSRC 1999) as the basis for population projections. The GSAR predicted a 14% increase in population within 50 miles of the MFFF for the year 2000. After reviewing the actual increases from the 2000 census data, DCS determined that the county populations within 50 miles actually increased by 16%. Therefore, the current GSAR underestimates population increase by 2%, and the GSAR is not scheduled for revision in the immediate future. More importantly, the CAR does not use these populations in any calculations. Accordingly, DCS does not believe that the difference in population data is significant enough to warrant updating at this time to the 2000 census.

1-2. DSER Sections 1.3.1.4, pg 1.3-5 and 1.3.2, pg 1.3-17, indicate that DCS needs to provide information relative to the sensitivity of the measurements made to verify that there is no hazard to workers from the proposed site soils. (SD-1)

During the 2000 geotechnical investigations, radiological testing was performed for drill cuttings and samples to ensure worker protection and acceptability of samples for transport over public highways. The scans consisted of local reading with a G-M meter from each location for which materials were removed for geotechnical testing. The nominal sensitivity for worker protection and transportation measurements is 0.1 mrem/hr. Following field measurements, select samples were analyzed in the laboratory for gross alpha and gross beta with minimum detectable activities of about 200 nCi/gm of gross alpha and about 100 pCi/gm of gross beta. Radioactive contamination was not detected in samples obtained at the MFFF site.

Subsequent to the 2000 geotechnical investigations DOE reported exceedances of drinking water maximum contaminant levels in the Old F-Area Seepage Basin monitoring wells. As a consequence of the exceedances in wells FNB-13, FNB-14, and FNB-15, DCS performed a groundwater survey on the MFFF site before beginning additional geotechnical work. Results of that sampling indicate that there was no groundwater located above the Tan Clay confining zone of the Dry Branch Formation. The Upper Three Runs Aquifer below the Tan Clay confining zone of the Dry Branch Formation that is at least 70 feet below the MFFF site is apparently contaminated from upgradient sources in F-Area and not solely from the Old F-Area Seepage Basin. Concentrations of gross alpha and beta activity, tritium, uranium and trichloroethyene exceeded maximum contaminant limits for drinking water. The source of groundwater contamination is from various heavy industrial and nuclear operations over the past 50 years in the F-Area. The contaminant plume appears to originate inside F-Area and extend beneath the MFFF site with movement in a fan-like direction of groundwater flow under the MFFF site. Contamination is most pronounced under the western edge of the site. Contamination was confined to the groundwater below the Tan Clay confining zone of the Dry Branch Formation. The deepest MFFF construction activities are anticipated to occur at least 30 feet above the zone of contamination (WSRC, 2002. *Work Task Authorization 06: Summary of Groundwater Quality at the Mixed Oxide Fuel Fabrication Facility Site (U)*, WSRC-RP-2002-4109, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC, May).

DCS Comments on Draft SER

Chapter 2, Financial Qualifications

Clarification/Correction of Statements:

2-1. Section 2.1.1, 2nd paragraph, pg 2.0-1, states "Detailed design costs have not yet been submitted to the NRC, but will be when available."

Proprietary cost estimates were provided in letter DCS-NRC-000059 dated 31 August 2001. In addition, DCS agreed in enclosure 2 of letter DCS-NRC-00092 dated 23 April 2002 to provide revised project design cost. The project design cost will be updated to reflect current cost, but will be provided at the same level of detail as provided in the proprietary letter DCS-NRC-000059.

DCS Comments on Draft SER

Chapter 5, Safety Assessment of the Design Basis

Clarification/Correction of Statements:

5-1. Section 5.1.4, 2nd paragraph, pg 5.0-3, states that "...for events identified as above low consequence, the accident sequences will be made to be highly unlikely." The PSSCs associated with satisfying the requirements of 10 CFR 70.61(c)(3), environmental consequence, will be designed and selected so as to ensure the accident sequence is unlikely. All other accident sequence likelihoods are currently anticipated to be shown to be highly unlikely (although it should be noted that this expectation exceeds regulatory requirements).

5-2. Section 5.1.4, 2nd paragraph, pg 5.0-3, states that "...this statement is a commitment to select and design PSSCs so as to keep the accident sequence to a likelihood of less than approximately 10^{-5} events per year." As observed previously in the same paragraph, DCS committed to a supplemental likelihood assessment for events involving exposure of the public and site workers only. Also, because NUREG-1718 and DCS' commitment indicate that such likelihood assessments can be qualitative, referring to a specific numerical probability may be misleading.

5-3. Section 5.1.4, 2nd paragraph, pg 5.0-3, states that "All initiating events were assumed to have a likelihood of 'not unlikely' which the staff interprets as having a probability of 1.0 per year." While DCS concurs that the deterministic assumptions with regard to internal event initiation can be said to result in a "probability of 1.0," expressing that as an annual probability has resulted in an implied definition of "Not Unlikely" that is inconsistent with the definition in CAR section 5.4.3 (pg 5.4-8), which defines this term as events that may occur during the life of the facility.

5-4. Section 5.1.5.2, pg 5.0-21, Fire Involving More than One Fire Area (Fire): The DSER cites fire suppression as an "additional protection feature." This term is used in the CAR to describe non-PSSCs that may nonetheless reduce challenges to items relied on for safety. However, in areas where dispersible radioactive material is present, fire suppression is conservatively designated as a PSSC.

5-5. Section 5.1.5.3, Pg 5.0-23, 3013 Canister (Load Handling): The CAR determined that the 3013 canister load handling event did not exceed the 10 CFR 70.61(c) threshold for the public (see CAR section 5.5.2.3.6.3). No PSSCs are required for the protection of the public.

5-6. Section 5.1.5.4, Pg 5.0-29, Laboratory (Explosion), cites the C3 confinement system as the PSSC for all receptors. DCS states that the PSSC identified to reduce risk to the site worker and the public is the C3 system (facility worker not included). For additional information, see the discussion in DCS comment 8-1.

DCS Comments on Draft SER

Chapter 5, Safety Assessment of the Design Basis

5-7. Modifications that should be made to Table 5-1 are as follows (If not already consistent with these items, the CAR will be revised as necessary.):

- Table 5-1, Pg 5.0-36, 3013 Canister: DOE-STD-3010-1996 is incorrect. Design bases values are provided in DOE-STD-3013-2000.

- Table 5-1, pg 5.0-38, C4 Confinement System: all duct work will be pipe per ASTM B31.3; the sheet metal duct work reference to ERDA 76-21 does not apply.

- Table 5-1, pg 5.0-41, Emergency Control System: there is no plan to use software programmable electronic systems in the emergency control system, therefore, the design basis codes and standards identified in the table are not applicable. The items to be deleted from the table are:
  Software programmable electronic systems per EPRI Topical Report TR-106439 (with NRC safety evaluation), IEC 61131-3 (1993-03), IEEE Std 7-4.3.2-1993, IEEE Std 730-1998, IEEE Std 828-1998, IEEE Std 830-1998, IEEE Std 1012-1998, IEEE Std 1028-1997, IEEE Guide 1042- 1987, IEEE Std 1074-1997, IEEE Std 1228-1994, NUREG/CR-6090, NUREG/CR-6463, RG 1.168, RG 1.169, RG 1.172, and RG 1.173.

- Table 5-1, pg 5.0-42, Emergency Diesel Generator Fuel Oil System: Design Basis Values should indicate the following: "Dual, independent supply subsystems with each subsystem[1] containing a 7 day + margin fuel storage tank, an immediate use day tank, a transfer pump (storage tank to day tank), strainers, filters and purification equipment." (Code citations should remain.)

- Table 5-1, pg 5.0-44, Instrument Air System (Emergency Scavenging Air)

  - Not all vessels that produce radiolytic hydrogen are supplied with Emergency Scavenging Air; only those that can produce a 4% concentration in 7 days are supplied with Emergency Scavenging Air.

  - A 100% capacity air bank (2 are provided) refers to sufficient capacity to prevent 1% concentration in all supplied tanks for 7 days.

- Table 5-1, pg 5.0-46, Process Safety Controls will not isolate glovebox pressurizing supplies on high GB pressure. Flow restricting orifices are provided on the inlet supplies and dump valves are provided to limit overpressure events.

- Table 5-1, Pg 5.0-47, Transfer Container: The Transfer Container will be used to transfer bagged contaminated items within the facility. It is not intended that

[1] Note: A subsystem is the supply to one Emergency Diesel Generator.

the container meet the requirements of DOE-STD-3013-2000 or withstand a 30-ft drop. The Transfer Container is a DOT Type A, Specification 7A. As stated in CAR Section 11.4.11.7, specific events associated with the Transfer Container will be identified in the ISA.

- Table 5-1, pg 5.0-47, Supply Air System: As clarification of DCS' 23 April 2002 letter, the Supply Air System filters will not be high temperature (450 F) filters. In addition, there are no HEPA filter housings and no HEPA filter housing testing requirements per ASME N509 and there will be no filter testing in accordance with ASME N510 (no filter boxes). The duct work design, fabrication and testing will be per ERDA 76-21 not AG-1.

Disagreement with Conclusion:

5-8. Section 5.4.1.3, Pg 5.0-6: DCS disagrees with the staff's conclusions regarding the exceptions to the evaluation methodology. The Safety Assessment of Design Basis documented in the CAR is based upon a Preliminary Hazards Analysis (PHA). The PHA method of hazard evaluation provides a broad, general evaluation of hazards and associated events and is followed by further detailed hazard evaluation studies as necessary. It is not the intent of the PHA nor is it required to identify all causes or initiators of a given event. Although some of the specific initiators listed on Page 5.0-6 were not identified, the general events were identified. These events provide enough information to determine the safety strategy, PSSCs and associated design bases to support the CAR. Where necessary, additional detailed hazard evaluation to be documented in the ISA will identify specific initiators such as those listed on Page 5.0-6 and specific IROFS. This method satisfies the requirements of 10CFR70.61 and is in agreement with the guidance provided in SRP-1718. Specific examples where DCS disagrees with this staff conclusion are as follows:

- The DSER states that DCS has not considered a high temperature non-fire related failure of gloveboxes. There are, however, a number of high temperature events discussed in the CAR including GB-6 (See CAR sections 5.5.2.1.6.1, pg 5.5-5 [Over-Temperature] and 5.5.2.1.6.9, pg 5.5-10 [Excessive Temperature Due to Decay Heat from Radioactive Material]). DCS has discussed this event in the response to RAI 50. Principal SSCs are identified in CAR 5.5.2.1.6.1, pg 5.5-6.

- The DSER states that DCS has not considered buildup of flammable gas an overvoltage condition in the dissolution unit electrolyzer potentially resulting in an explosion. Event AP-7, however, discusses explosions in the electrolyzer.

- The DSER states that DCS has not considered the accident scenario of a hydrogen explosion in the glovebox outside of the sintering furnace airlock due to insufficient purging in the airlock. Event PT-4, however, describes explosions involving the sintering furnace.

- The DSER states that DCS has not considered events involving titanium, such as titanium fires that the staff believes can occur in the silver recovery and dissolution units. Events AP-5 and GB-1, however, describe fires involving gloveboxes (and their contents).

- The DSER states that DCS has not considered events involving the loss of nitrogen to the bearings of the calciner, causing the bearings to overheat resulting in damage to the calciner and potential loss of Pu. As indicated in the CAR, however, the C4 confinement system has been identified as the principal SSC to protect the facility worker in the event of a leak of the furnace, which is contained in a glovebox. Thus, the bearings do not constitute a credited confinement barrier, and the nitrogen system is not a PSSC.

Pending Changes:

5-9. Section 5.1.5.3.1, Pg 5.0-14, 3013 Canister Handling Operations (Confinement) and Table 5-1, Pg 5.0-36, 3013 Outer Canister Opening Device The design of the 3013 outer can opening station is being revised. These operations will now occur in a glovebox. In the event of a can breach, the operator will be protected by the glovebox and the VHD HVAC system. The CAR will be revised to reflect this information. No new principal SSCs will be required, and the outer can opening device will no longer be considered a PSSC.

DCS Comments on Draft SER

Chapter 6, Nuclear Criticality Safety

Clarification/Correction of Statements:

6-1. Section 6.1.3.5.1, pg 6.0-15, NCS Validation Report Parts I and II, states: "As a result, USL-2 is normally significantly lower than USL-1, as it has additional margin resulting from the uncertainty with regard to the population variance (i.e., the distribution of all future calculations)." However, the computation of a USL-1 value requires the specification of an arbitrary administrative margin term. Hence, to say that "USL-2 is normally significantly lower than USL-1" presupposes an inadequate value for this administrative margin. Presumably, the NRC statement refers to the comparison of USL-2 and USL-1 *when the administrative margin is set to zero* in the USL-1 calculation (the *desired* result is to specify an administrative margin sufficient to have USL-1 less than USL-2).

6-2. Section 6.1.3.5.2, pg 6.0-16, AOA(1): Plutonium Nitrate Solutions, states: "Comparing the results of USL-2 with USL-1, for EALF, H/Pu ratio, and ^{240}Pu content, the USL-2 was less than USL-1 and therefore the applicant determined that the use of 0.05 as the administrative margin was appropriate." However, DCS points to the preceding sentence in this paragraph ("Table 6-1 showed that, for ^{240}Pu content, the minimum USL-1 with that margin was 0.9449 and the minimum USL-2 was 0.9867.") that indicates the USL-2 value is **greater** than the USL-1 value, not less than the USL-1 value. This comparison is used as an indication that an adequate administrative margin has been specified in the USL-1 calculation.

6-3. Section 6.13.5.2, pg 6.0-17, indicates (in the paragraph beginning "The third justification…") that "NUREG-1718, Section 6.4.3.3.4, 'Requirements of Proposed 10 CFR 70.61 (Subcriticality of Operations and Margin of Subcriticality for Safety),' states that a margin of 0.05 is 'typically considered acceptable for most cases' that are statistically well-represented, but that the applicant should justify the administrative margin chosen." DCS notes that the title of this section is "Requirements of 10 CFR 70.61 (Subcriticality of Operations and Margin of Subcriticality for Safety)," and that the closest language to that cited is: "Note: a minimum subcritical margin of 0.05 is generally considered to be acceptable without additional justification when both the bias and its uncertainty are determined to be negligible."

6-4. Section 6.1.4.3, pg 6.0-22, Commitment to ANSI Standards, regarding DCS' commitment to ANSI/ANS 8.1-1983, states: "In addition, since the standard was merely reaffirmed in the 1998 version, the staff considers the use of the 1998 version acceptable." However, in section 6.1.4.3 (pg 6.0-21, first bullet), DCS committed to ANSI/ANS 8.1-1983 (R1988) and not the 1998 revision to ANSI/ANS 8.1. The 1998 version of ANSI/ANS 8.1 is not a reaffirmation of the 1983 version; it contains some differences from the 1983 (R1988) version. Therefore, consistent with Regulatory Guide 3.71, DCS commits to the 1983 (R1988) version of the standard.

DCS Comments on Draft SER

Chapter 7, Fire Protection

Clarification/Correction of Statements:

7-1. Section 7.1.2.4, 1st bullet, pg 7.0-3, states that cables in redundant electrical trains are separated by "a distance of at least of 150 feet (48.8 m)." Since there are no definitive fire separation distances regarding redundant electrical trains, the inference that there is a fire separation distance of at least of 150 feet is incorrect and does not reflect MFFF fire safety design. Therefore, the 1st bullet should read as follows: "Cables in redundant electrical trains are separated by the Institute of Electrical and Electronics Engineers (IEEE) 384 (Reference 7.3.3) electrical separation criteria or an enclosed raceway is used."

7-2. Section 7.1.2.4, 2nd bullet, pg 7.0-3, states that the IROFS electrical trains enter on different floors of the MOX Processing Area. The present design of the main electrical trains has them entering the BMF from different sides of the building (approximately 150 linear feet apart) but on the same floor. However, immediately after entering the building they are routed to separate floors of the MOX Processing Area.

7-3. Section 7.1.2.5, pg 7.0-5, states that the fire detection/alarm system can be powered by "the standby AC power systems, and then by the emergency power systems. The emergency power systems are PSSCs." However, the fire detection/alarm system is not powered by the emergency power systems, but it is powered by the standby AC power systems and by battery backup. Therefore, the sentence should be modified to read as follows: "...the detection/alarm system can be powered by the standby AC power systems, and then by battery backup."

7-4. Section 7.1.2.8, last paragraph, pg 7.0-6, states that the airlocks "maintain a negative pressure with respect to the areas adjacent to the process room." To better reflect the MFFF ventilation design, this statement should be revised to state "maintain a positive pressure with respect to the process rooms."

7-5. Section 7.1.2.8, last paragraph, pg 7.0-6: it should be noted that an independent ventilation system is not provided for the airlocks. The High Depressurization Exhaust (HDE) system ventilation exhausts the airlock and the secondary confinement system.

7-6. Section 7.1.2.8.1, pg 7.0-6, states that "no ignition sources ... are allowed within the filter housings or filter housing rooms." There are no prohibitions on ignition sources within filter housing rooms, therefore, to better reflect the MFFF fire safety design, the statement should be revised to state "ignition sources are minimized and limited combustible materials are allowed within the filter housings and filter housing rooms."

7-7. Section 7.1.2.10, 1st paragraph, last sentence, pg 7.0-7, states that the firewater distribution systems that support the MFFF are hydraulically designed in accordance with NFPA 13, 14, 20, 22, and 24. NFPA 20 and 22 are not included in the design basis of the MFFF since the MFFF will not have any of its own fire pumps or firewater tanks. Therefore, to properly reflect the MFFF firewater distribution system, the last sentence of DSER Section 7.1.2.10 (pg 7.0-7) should be revised to state the following: "The MFFF firewater distribution systems are hydraulically designed to meet NFPA 13-1996, NFPA 14-1996, and NFPA 24-1995."

7-8. Section 7.1.2.11, 6th paragraph, last sentence, pg 7.0-8, states that the portable carbon dioxide bottles (for glovebox internal suppression) are "extinguishers." Since portable bottles are not considered to be portable fire extinguishers (in the sense of NFPA 10), this sentence needs to be rewritten to clearly state the nature of the portable carbon dioxide bottles and how they work. Therefore, the last sentence should state the following: "These portable bottles can be quickly connected to the glovebox to suppress fires within the glovebox without over-pressurizing the glovebox." In a similar vein, the fifth line on DSER page 7.0-9 needs to be revised to state "portable CO_2 bottles," not extinguishers.

7-9. Section 7.1.2.12, 1st paragraph, pg 7.0-9, and Section 7.1.2.13, 2nd paragraph, pg 7.0-10: the glovebox nitrogen systems are currently not designated a PSSC. While they do reduce challenges to items relied on for safety, DCS has typically reserved the term "defense in depth" to items that are not specifically credited for safety, but are nonetheless conservatively designated PSSCs. DCS suggests clarifying this point, perhaps using the term "additional protection feature," or simply citing the generic nature of the "defense in depth" protection provided by these systems.

7-10. Section 7.1.2.13, 1st paragraph, pg 7.0-9, and Section 7.1.2.13, last paragraph, 2nd sentence, pg 7.0-10, refer to "glovebox windows consist of rectangular fire resistant polycarbonate panels ..." and "fire resistive polycarbonate." On the surface, this is a correct statement since polycarbonate, exhibits significant resistance to fire. However, the term "fire resistant" connotes a definitive fire resistance, and while there are polycarbonate materials with such definitive fire resistance, the current the MFFF design does not anticipate their use. Therefore, DCS suggests removing the words "fire resistant" and "fire resistive."

7-11. Section 7.1.2.13, 3rd paragraph, 2nd sentence, pg 7.0-9, states that heat detectors are installed in gloveboxes where the use of smoke detectors is prohibited due to conditions such as dust." The MFFF fire detection design does not include a *prohibition*; Section 7.2.3.2 of the CAR states that smoke detectors are *preferred* but in dusty conditions (i.e., gloveboxes containing powders), heat detectors are *preferred.* To clarify the intent of this sentence, DCS suggests DSER Section 7.1.2.13 be reworded to state: "However, where dusty conditions limit the effectiveness of smoke detectors, heat detectors will be installed."

7-12. Section 7.1.2.14, 1st paragraph, pg 7.0-10, states that the "Purification and Solvent Recovery cycles involve a solvent-diluent mixture, which is flammable." The solvent and diluent are Class IIIB and IIIA *combustible* (not *flammable*) liquids, respectively, per the NFPA 30 definitions of combustible and flammable liquids. Therefore, "flammable" needs to be replaced with "combustible."

7-13. Section 7.1.5.3, pg 7.0-13, 1st sentence of the paragraph at the bottom of the page states, in part, that "2-hour fire barriers isolate process cells from each other." Some process cells have fire barriers that have a fire-resistance of 3 hours; for example, all of the fire barriers surrounding Room C-136 have a fire-resistance of 3 hours. DCS suggest, therefore, inserting "minimum" before "2-hour fire barriers."

7-14. Section 7.1.5.6, pg 7.0-15, 5th bullet, it is stated that "fire doors between fire areas are self closing." Some doors (i.e., that are normally closed) will fail as-is during a loss of power. These doors include the cut-off (PML) doors, the rotating jar doors, and the trap (SMK) door. DCS recommends this bullet be revised to state: "Fire doors between fire areas are normally closed and/or self closing."

7-15. Section 7.1.5.6, pg 7.0-15, 7th bullet, should be revised to reflect the design of the HVAC systems since the secondary confinement areas are at a more negative pressure than the tertiary confinement areas. DCS suggests replacing "negative" with "positive" in the second sentence of the bullet. (See also comment 7-4.)

7-16. Section 7.3.4, pg 7.0-18, lists NFPA 20, 22, 31, and 58 as references, but these NFPA codes are not part (explicitly or implicitly) of the MFFF fire protection design basis. Therefore, these codes should be removed from the reference list. (See also comment 7-7)

7-17. The DSER states (in Sections 5.1.5.1 [pg 5.0-10], Table 5-1 [pg 5.0-45], 7.1.2.1 [pg 7.0-2], 7.1.2.6 [pg 7.0-5], and 7.1.5.4 [pg 7.0-14]) that the exterior BMF walls have a fire-resistance of at least 3 hours. This conclusion may have been reached because the BMF structure is required to comply with NFPA 220, which stipulates that the exterior structural elements of the BMF structure be constructed to have a fire-resistance of at least 3 hours. However, since the exterior BMF wall is comprised of non-structural elements such as fire doors and penetration seals, and the FHA and the fire area/barrier/suppression drawings only credit these walls of having a fire-resistance of 2 hours, it should only be concluded that the exterior BMF walls have a fire-resistance of *at least* 2 hours.

7-18. Section 7.1.2.5, 2nd paragraph, pg 7.0-4, states that "smoke detection is provided in all areas of the BMF." This statement can be implied to mean that smoke detection is physically within all areas of the BMF, which is not correct. To properly reflect the fire detection scheme of the BMF, the "in" within this statement needs to be replaced with "for."

7-19. Section 7.1.2.9 last paragraph, pg 7.0-7, states that the "applicant designated fire barriers as PSSCs." This statement can be inferred to mean that all fire barriers are PSSCs, which is not correct. To properly reflect the fire barriers that are PSSCs at the MFFF, the statement should be revised to state that the "applicant designated the BMF and BEG fire barriers as PSSCs."

DCS Comments on Draft SER

Chapter 8, Chemical and Process Safety

Clarification/Correction of Statements:

8-1. Section 8.1.2.1.2.3, pg 8.0-6, states that for the laboratory explosion event "The applicant has proposed that the C3 Confinement System is the PSSC for all receptors (facility worker, site worker, public and the environment) for this event. The safety function of the C3 Confinement System would be to provide filtration to mitigate dispersions from the C3 areas." This statement is not accurate. In CAR Section 5.5.2.4.6.9, pg 5.5-31 it is stated that to protect the facility worker a "...safety strategy utilizing both prevention and mitigation is adopted. These features will ensure that the performance requirements of 10 CFR 70.61 are satisfied. Specific safety features will be developed as part of detailed design" and will become IROFS during the ISA.[2] Thus, for the facility worker, features other than the C3 Confinement System will be utilized to protect the worker.

8-2. Section 8.1.2.1.2.3, pg 8.0-7, states that the staff, based on Section 10 of the DSER, has "a concern about the overall safety strategy for environmental protection." However, Chapter 10 of the DSER indicates, on page 10.0-15 (Section 10.2) that "...the methodology is acceptable" and only for "certain events" is the staff "continuing its review to ensure the results remain sufficiently conservative to ensure an adequate margin of safety." Thus, the statement regarding "the overall safety strategy for environmental protection" seems inconsistent with the staff's environmental review, which accepts the safety strategy for environmental protection.

It is not apparent how open item from Chapter 10 is related to an explosion in the laboratory. Specifically, the concern addressed in this paragraph of the DSER related to analyzing 5 grams of Pu in the laboratory explosion is not accurate. The actual analysis of the laboratory explosion event analyzed 5 grams of unpolished plutonium dioxide in direct contact with the explosive material and 500 grams of unpolished plutonium dioxide indirectly impacted by the explosion.

8-3. Section 8.1.2.3, Section 8.1.2.4, and Section 8.1.2.6: The staff appears to have misinterpreted the chemical consequence analysis performed by DCS and its safety strategy for treating chemical releases, thereby drawing incorrect conclusions with respect to the chemical consequence modeling and safety strategy. The staff seems to have a concern based on the assumptions that operator actions outside the control room or PSSCs may be adversely impacted by a chemical release, such that additional chemical control PSSCs may be necessary.

In the Preliminary Hazards Analysis, DCS concluded that direct chemical releases from either the BRP or the BAP do not result in exceeding the performance requirements of 10 CFR 70.61.

[2] As stated in SRP section 8.5.1.A, "Where information is under development or not yet available, the applicant may use a commitment to provide the material with the application for a license to possess and use in SNM in lieu of the actual material."

For the BRP, this conclusion is based on several factors. First, the BRP contains no licensed materials. By definition, therefore, the BRP also can contain no *hazardous chemicals produced from licensed materials* [see 10 CFR 70.4]. The only event that could impact facility safety in the context of 10 CFR 70, therefore, would be a release that compromises other PSSCs or operator actions important to mitigating a release. DCS has indicated previously that no operator actions relied on for safety are expected to be impacted by such a release.

As clarification: no event sequences in the safety assessment of the design bases include operator actions outside the Emergency Control Room that are relied on for mitigation of a chemical event. (Further, DCS does not anticipate that such an event will result from the ongoing ISA.) DCS therefore believes that the presumption by the staff that such an operator action *may be* identified in the future is unwarranted.

Consequently, issues such as those related to concentration controls for delivered chemicals (see second bullet on page 8.0-24 of the DSER) or asphyxiates are not relevant.

Unlike the BRP, the BAP does include both licensed materials with potential for chemical exposure and hazardous chemicals produced from licensed materials. As indicated in comment 8-6, however, DCS has stated previously that the PSSCs provided for protection against radiological exposure or criticality also provide adequate protection for facility workers from chemical exposure from licensed materials and hazardous chemicals produced from licensed materials[3]. The sole exception (i.e., where an *additional* PSSC is designated specifically for chemical protection), also discussed in comment 8-6, is the Emergency Control Room Air Conditioning System.

DCS also has concluded that chemical releases from the BAP do not exceed 10 CFR 70.61 performance requirements. In many cases, the chemical consequences evaluated by DCS have been evaluated using the larger quantities of chemicals found in the BRP to bound the quantities and concentrations present in the BAP, irrespective of the fact that chemical releases from the BRP are not relevant with respect to 10 CFR 70 compliance (owing to the lack of operator safety actions outside the Emergency Control Room). This analysis was only intended to bound potential chemical consequences to the site worker and the public that may

[3] DCS has provided a safety strategy for the facility worker to treat chemical consequences that may accompany a radiological release in Section 5.5.2.10.6.2 of the CAR. This safety strategy utilizes the same principal SSCs that protect the facility worker from the radionuclide release to protect the facility worker from a chemical release. For example, gloveboxes and the C4 confinement system protect the facility worker from chemical releases within gloveboxes, process cells protect facility workers from releases within the process cells, and features that prevent explosions and fires prevent chemical consequences to the facility worker.

accompany a radiological release from *within* the BAP (which could, therefore, fall within the NRC purview per 10 CFR 70.61). Based on this bounding chemical analysis, DCS has concluded that all chemical reactants found within the BAP will not exceed the performance requirements of 10 CFR 70.61. Furthermore, DCS has committed to justify as part of the ISA that the conditions, concentrations, and quantities of chemical species in the process are bounded by the chemical analyses performed to date. Thus, as part of the process hazards analysis for the ISA, DCS will verify that there are no accident sequences that produce larger releases than analyzed and that all chemicals have been analyzed.

8-4. Section 8.1.2.3 and Section 8.1.2.4: The chemical consequence analysis presented by the staff is misleading and its results inaccurately portray the chemical hazards at the MFFF. Based on the information presented in Draft SER sections 8.1.2.3 and 8.1.2.4, it appears the staff's chemical consequence results are inflated (in some cases by orders of magnitude) due to the application of overly conservative assumptions and methods. For example, the use of the ALOHA code to model nearby chemical dispersion neglects the effects of plume meander and building wake effects. The inflated results then lead the staff to the incorrect conclusion that PSSCs for the site worker and public for chemical events originating in the UO2 storage areas or the BAP are required.

Disagreement with Conclusions

8-5. Section 8.1.2.4.1, pg 8.0-25: DCS disagrees with the staff conclusion found on DSER pg 8.0-26 that states "...that N_2O_4 released from plutonium processing via the offgas system can exceed TEEL-2 limits at the controlled area boundary and potentially impact the offsite public." NOx gases are produced in the AP processes and these NOx gases could conceivably include small quantities of N_2O_4. Based on the insignificant quantities of N_2O_4, TEEL limits will not be exceeded.

8-6. Section 8.1.2.4.1, 3rd paragraph, pg 8.0-25: The reviewer states that "the Emergency Control Room Air Conditioning System is the only principal SSC identified for chemical safety, for protecting operators; no principal SSCs are currently identified for chemical releases that could impact the safe handling of radioactive materials." This statement is misleading and incorrect. For chemical releases that accompany a radioactive material release, CAR Section 5.5.2.10.6.2, (pg 5.5-44 and -45) states that "PSSCs that protect the facility worker from radioactive material releases also provide protection for chemical releases. Thus, no additional principal SSCs are required for these events" (emphasis added).

Pending Changes

8-7. Section 8.1.2.5.2.3, pgs 8.0-30 & 31: As previously stated in the "Clarification of Responses to NRC Request for Additional Information" letter dated 23 April 2002, DCS is in the process of responding to a NRC request on a detailed assessment of the use of HAN/hydrazine in the AP Process. Statements made regarding the preliminary study by the applicant are currently being refined and the CAR will be revised accordingly.

DCS Comments on Draft SER

Chapter 9, Radiation Safety

Clarification/Correction of Statements:

9-1. Table 9.1-6, pg 9.0-12, Event GB-1, PuO_2 Buffer Storage Area. For GB-1 in the MFFF CAR, PuO_2 Buffer Storage area, the fire consequences are mitigated as opposed to the fire being prevented.

9-2. Section 9.1.2.4, 1st paragraph, p. 9.0-18, states that "The applicant assumed that no more than one-half of the room volume is available for dispersion of airborne material following the release." This statement should be either deleted or amended to reflect that two separate methods were used to analyze dose consequences to the facility worker: (1) one method assumed one-half of the room volume is available for dispersion of airborne material following the release and (2) an alternative method assumed an expanding plume for dispersion of airborne material following the release.

9-3. Section 9.1.2.10, pgs 9.0-20 and 9.0-21, and Section 9.2, pg 9.0-22, last bullet: DCS believes that the staff is saying that SRS employees whose duties do not involve exposure to radiation are not "workers" as defined in the regulations and are subject to public dose limits under Part 20 during normal operations, but that under 70.61(f), so long as they are trained (and appropriate notices are posted), these "non-workers" may still be analyzed against the accident performance requirements for workers. However, the language as worded could imply that the staff is suggesting that these persons, even if properly trained, are subject to the 70.61(f) performance requirements for the *public*. These statements should be clarified.

DCS Comments on Draft SER

Chapter 11.2, Aqueous Polishing Process and Chemistry

Clarification/Correction of Statements:

11.2-1 Section 11.2.1.1, pg 11.2-4, states "the applicant has stated that there are no design bases for the plutonium feed to the facility (Reference 11.2.4.1, RAI 50)." In the NRC's 27 June 2002 letter it is acknowledged that design bases information for the feed material was included in the CAR and in an earlier response by the applicant. However, in the subject letter there is a statement requesting additional feed information as follows: "The staff notes that chemical impurities (e.g., listed in draft SER Table 11.2-1) influence facility design and the inclusion of alternate feedstock material (essentially less pure plutonium) is resulting in design changes and the handling of additional chemicals (e.g., chlorine) and potentially hazardous operations (e.g., additional electrolysis). The staff anticipates there may be similar design impacts from physical parameters, such as morphology and matrix. The applicant should state whether chemical impurity and morphology values are design bases for specific PSSCs in the facility or justify why they are not design bases."

As indicated in NRC's letter of 27 June 2002, DCS is evaluating the impact of alternate feedstock and associated impurities on the design and design basis, any identification of changes to the design basis will be provided in the amendment to the CAR. As no submittal has yet been made with regard to alternate feedstock, these changes are outside the scope of this review.

As indicated in DCS letter of 23 April 2002, morphology and matrix are not design bases for the electrolyzers because they are designed critically safe for undissolved plutonium oxide or – as in the case of the silver recovery unit – do not contain plutonium oxide.

11.2-2 Section 11.2.1.2, pg 11.2-7, states that "The electrolyzer is an important component in the MFFF. In its review, the staff could not find a clear delineation of the design bases associated with this component. Only the aforementioned plutonium processing rate is specified and a temperature limit is implied, based upon a potential fire event." This statement seems to imply that the plutonium processing rate is design basis, however, DCS has not stated that the plutonium processing rate is a design basis for the electrolyzer. As previously stated in the 23 April 2002 DCS RAI response, the CAR submittal presented the hazards, safety strategies, principal SSCs, and accompanying safety strategy and design basis associated for *all* process units. As described in the 23 April 2002 RAI response, the information presented in the CAR may be re-organized to provide a clearer identification of the safety strategy and principal SSCs. This re-sorting of information was provided for the electrolyzer unit in that letter.

Chapter 11.2, Aqueous Polishing Process and Chemistry

Disagreement with Conclusions

11.2-3 Section 11.2.1.2, pg 11.2-8, states that "Additionally, the applicant was not aware of any specific changes to the electrolyzer's design because of lessons-learned from France" And that "the staff...believes the applicant needs to verify that any lessons-learned from experience at facilities in France and chemical process industry practice with electrolyzers have been adequately considered and addressed by the design bases and control strategy." Note that this item is not listed in Appendix A as an open item.

Section 12.2.3.1, pg 12-3, of the CAR states that "the MFFF is based on the proven design of COGEMA's MELOX and La Hague facilities." The MFFF effectively represents the next generation of many aspects of the design of these two facilities. ... To supplement their use as a 'reference design,' operational experience is incorporated into the design through a combination of lessons-learned evaluations (focusing on operability and maintainability issues, and involving current operations and maintenance personnel) and review of the design on an ongoing basis by experienced operations staff." Therefore, DCS believes that lessons learned have appropriately been included in the design of our facility.

Notwithstanding this general commitment, however, DCS is unaware of a regulatory requirement that would necessitate "verification that any lessons-learned from experience in France."

11.2-4 Section 11.2.1.2, pg 11.2-8 and11.2-9, states (pg 11.2-8) "As already noted, the staff review indicates a number of parameters in the CAR and applicant responses (such as voltage/electrical, silver ion concentration(s), and flammable vapor limits) that could be used to avoid fire," and (pg 11.2-9) "The applicant's hazard and accident analysis did not include events involving titanium, such as titanium fires. Accident events should be evaluated and PSSCs identified, if necessary. This may involve means to monitor local metal temperatures, detect metal fires, avoid over temperature, avoid sparks, and/or actively quench the metal and components."

DCS disagrees with the staff's remarks concerning the need for additional PSSCs to prevent electrolyzer fires. DCS has previously identified the safety strategy of mitigating the consequences of fires in Tables 5.5-13 and 5.5-14 of the CAR for glovebox fires to meet the performance requirements of 10 CFR 70.61. In addition, PHA event AP-5 in Appendix 5A did identify electrolyzer fires (note: the electrolyzer is in a glovebox) as an event. The mitigating features (PSSCs) identified for this event is for the facility worker to leave the area and the C3 confinement system is credited for protecting the site worker and public. Consequently, there is no need for additional controls to be designated as PSSCs.

Chapter 11.2, Aqueous Polishing Process and Chemistry

11.2-5 Section 11.2.1.2, pg 11.2-9 (and throughout), states "The staff review has identified a potential event involving an acute chemical exposure to facility and site workers from hazardous chemicals predicted from licensed materials that leak from AP process vessels during such a loss of confinement event." As stated in CAR Sections 5.5.2.1.6.4, pg 5.5-7 consequence analyses were performed and it was determined that leaks of radiological material within process cells have been evaluated and do not exceed the performance requirements of 10 CFR 70.61, both radiologically and chemically. DCS has provided additional rationale for this statement in response 8-4.

11.2-6 Section 11.2.1.4, pg 11.2-12: the staff has stated that no design bases have been presented for the KPB unit. As previously stated in the 23 April 2002 DCS RAI response, the CAR submittal presented the hazards, safety strategies, principal SSCs, and accompanying safety strategy and design basis associated for *all* process units. As described in the April 23, 2002 RAI submittal, the information presented in the CAR may be organized in a manner analogous to that described for the dissolution unit electrolyzer in the Attachment to enclosure 1 of the 23 April 2002 submittal for the KPB unit. DCS can perform the re-sorting of information presented in the CAR for this unit if necessary.

11.2-7 Section 11.2.1.5 pg 11.2-14 and Section 11.2.1.8, pg 11.2-17: the staff states that within the KCA and KCD unit acidification of the oxalic mother liquor is a safety function. This is incorrect. Nuclear criticality control within the KCA/KCD tanks that may contain plutonium oxalate are geometrically favorable for plutonium oxalate, as shown in Table 6-1, such that, contrary to the DSER statement, accumulation of plutonium oxalate precipitate does not create a safety concern. Thus, under certain process conditions, excess oxalic acid, which could result only in plutonium oxalate precipitate, is also not a safety concern.

11.2-8 Section 11.2.1.4, pg 11.2-14: the staff implies that a safety function be ascribed to the nitrogen system as a result of it providing cooling to the bearings of the calciner. As indicated in the CAR, the C4 confinement system has been identified as the principal SSC to protect the facility worker in the event of a leak of the furnace, which is contained in a glovebox. Thus, the nitrogen system is not a PSSC.

11.2-9 Section 11.2.1.11, last paragraph, pg 11.2-23, states "The process handles gases and vapors that are potentially reactive and toxic, such as nitrogen tetroxide, nitric acid, NOx, and hydrazine. The unplanned evolution of these gases via the off-gas treatment unit could have potentially detrimental consequences that would likely exceed the performance requirements of 10 CFR Part 70 at considerable distances from the proposed facility." As previously stated, DCS believes that the assumptions and methodology utilized by the staff have led to gross inaccuracies in the computation of consequences and hence do not represent results that are applicable to the MFFF. DCS is particularly concerned about the characterization of this event as "likely" and as exceeding 10 CFR 70 performance requirements at "considerable distances," as it does not reflect the robust safety indicated in the CAR and in the much of the rest of the DSER.

Resolution of Open Items

11.2-6 Section 11.2.1.2, pg 11.2-8, states "Consequently, the staff concludes the applicant has not provided sufficient justification for protecting the electrolyzer against the over-temperature event in the applicant's hazard and accident analysis." As noted in the NRC's 27 June 2002 NRC letter, DCS provided a response in DCS' 23 April 2002 letter and identified temperature sensors to preclude an over-temperature event in the electrolyzer. It was also stated in both letters that the temperature sensors are provided at the source of heating to ensure process is shut down, by cutting power to the electrolyzer, prior to exceeding safety limits. The NRC's then states "However, this new information is not identified as part of the design basis."

As clarification: the temperature sensors are part of the process safety I&C system, identified as PSSC in the CAR Table 5.6-1, "Shut down process equipment prior to exceeding temperature safety limits." In addition, DCS provided additional information through the transmittal of RAI response 50, pg 50-2 and the follow-up response (#3) in the letter dated 23 April 2002 that indicated multiple redundant temperature sensors would be utilized to preclude an over-temperature event.

DCS Comments on Draft SER

Section 11.4, Ventilation and Confinement Systems

Clarification/Correction of Statements:

11.4-1. Section 11.4.1.1.1, 4th bullet, last sentence, pg 11.4-3, states "Glove boxes that contain powder or pellet forms are inerted with nitrogen gas to minimize the potential for fires (Reference 11.2.3.15, Section 11.4.7)." This is not correct. Glove boxes that contain powder or pellet forms are inerted with nitrogen gas to eliminate adverse effects of atmospheric oxygen on the process or fuel as an operational or fuel quality issue. (See also comment 7-9.)

11.4-2. Section 11.4.1.1.1, 5th bullet, 4th sentence, pg 11.4-3, is incorrect because the polycarbonate that will be utilized for the glovebox windows will be "normal" polycarbonate and not a "special application" type. Therefore, the phrase "generally special application" needs to be deleted. Additionally, as a general comment, the references at the end of the bullets in this section (i.e., references to NUREG-1718) are unclear.

11.4-3. Section 11.4.1.1.1, last paragraph, pg 11.4-4, is not consistent with MFFF design. This paragraph should be changed as follows: "Ductwork is designed, fabricated, and tested in accordance with ERDA 76-21 and ASME N509 (References 11.4.3.14 and 11.4.3.6)." The reference to ASME AG-1 applies only to flexible pipe and ductwork connections. Table ll.4-1 and Table 5-1 should be modified accordingly.

11.4-4. Section 11.4.1.1.2, pg 11.4-5, 4th bullet: the phrase "air temperature instrumentation for fire protection" is utilized. This phrase is incorrect, it appears that the intent of this bullet can be fixed by removing the words "for fire protection and" from the bullet.

11.4-5. Section 11.4.1.1.2, pg 11.4-5: DCS suggests a rewrite of the sentence at the next-to-last bullet as: "Nitrogen and dry air supply flow control is provided to ensure that proper confinement zone negative pressures are maintained."

11.4-6. Table 11.4-1, pg 11.4-7, C4 Confinement System: one of the controlling parameters is identified as "Fire-rated dampers between designated fire areas." However, since the C4 system does not utilize fire dampers (it utilizes fire isolation valves instead), this is an incorrect statement. To correct the intent of the statement, it needs to be replaced with the following: "Fire isolation valves between designated fire areas."

11.4-7. Table 11.4-1, pg 11.4-7, C4 confinement systems: All duct work will be pipe per ASTM B31.3. Sheet metal duct work and reference to ERDA 76-21 do not apply.

11.4-8. Table 11.4-1, pg 11.4-11, Supply Air System: As clarification to DCS' 23 April 2002 letter, the Supply Air System filters will not be high temperature (450 F) filters. In addition, there are no HEPA filter housings and no HEPA filter housing testing requirements per ASME N509 and there will be no filter testing in accordance with ASME N510 (no filter boxes). The duct work design, fabrication and testing will be per ERDA 76-21 not AG-1. [This should also be consistent with table 5-1 and our comments therein.]

DCS Comments on Draft SER

Section 11.5, Electrical Systems

Clarification/Correction of Statements:

11.5-1. Section 11.5.1.3.1, pgs 11.5-6 to 11.5-8 and Section 11.5.1.3.2, pgs 11.5-8 and 11.5-9 identify standards and regulatory guides, particularly as related to civil design (e.g. ASCE 4-98, ANSI/AISC N690, RG 1.61), that were not identified as directly applicable to the electrical systems design. These standards may be references contained within other cited documents; however, these documents were not directly identified as design basis documents in CAR Section 11.5. Seismic qualification of electrical equipment is via IEEE 344-1987 and the additional criteria from Regulatory Guide 1.100 (see DCS letters dated 07 Jan 2002 (enclosure A, pg 22) and 11 Feb 2002 (enclosure A, pg 2)).

DCS Comments on Draft SER

Section 11.6, Instrumentation and Control Systems

Clarification/Correction of Statements:

11.6-1. Section 11.6.1.1.2.2, pg 11.6-2. The "safety" system in the utility control area has no safety function in terms of meeting 10CFR70 performance requirements. These are "backup" controls. This clarification is related to DCS' commitment to clarify the terms in the CAR associated with "safety systems" (open item SA-1).

11.6-2. Section 11.6.1.1.2.4, pg 11.6-2. The Ethernet technology (IEEEE 802.3) systems do not include the data communications links between the sensors and the controllers (PLCs). That data link is hard-wired (Profibus or some other data multiplexing method depending on the application of the sensor and controller).

11.6-3. Section 11.6.1.1.2.5, 3rd bullet, pg 11.6-3: The emergency control rooms have independent ventilation systems, not redundant ventilation systems. Each control room has a single ventilation system. The emergency controls have priority over the utility safety (utility backup) controls. The only "control" exercised in the emergency control room or by the emergency control system over any of the AP or MP process systems is the ability to shut off all the power to the AP and MP process units. No further control is required.

11.6-4. Section 11.6.1.1.2.7, 3rd bullet, pgs 11.6-4 and -5: In the discussion of safety controllers it should be made clear that the "safety" controllers in the utility systems are not PSSCs. (See comment 11.6-1.) (Note that in a related change, because there will generally be two safety controllers, one will be located in a room separate from the normal controller. The other one could be located in the same room as the normal controller. This issue will be clarified in the upcoming CAR amendment.)

11.6-5. Section 11.6.1.3.1, pg 11.6-6, 1st sentence. In the phrase ". . . emergency control system and related safety control subsystems. . ." the term "related" is not clear. The Emergency control system has very little to do with the AP or MP systems or the (process) safety control systems (see comment 11.6-3). This should probably read ". . . emergency control system and the AP and MP safety control subsystems . . .", recognizing the need to identify the latter two control systems as the "process safety systems." (Note this issue will be further clarified with the submittal of additional information pursuant to open item SA-1.)

DCS Comments on Draft SER

Section 11.8, Fluid Transport Systems

Clarification/Correction of Statements:

11.8-1. Section 11.8.1.1, pg 11.8-4, 1st full paragraph, states "Check valves may be of the following types; butterfly, gate, plug, or ball." This should be changed to, "*Isolation* valves may be of the following types; butterfly, gate, plug, or ball".

11.8-2. Section 11.8.1.1, pg 11.8-4, last paragraph, states "ASME materials are used in the fabrication of equipment and piping components built into the requirements of ASME B&PV Code, Section VIII, Rules for Construction of division 1 Pressure Vessels, 1995 edition through the 1996 Addenda." The code edition reference should be the stated project preference of ASME B&PV Code, Section VIII, 1996 Edition through 1998 addenda. This comment is applicable globally through Section 11.8 where ASME Section VIII references are mentioned.

11.8-3. Section 11.8.1.3, pg 11.8-16 & 11.8-17, Design Basis of PSSCs, Evaluation of Functionality During Severe Natural Phenomena: No concluding statement is made that NRC finds the design basis to be acceptable. It is not clear that this is an oversight, or if it is attributed to the two statements in the DSER discussion: (1) items that are neither SC-I nor SC-II are not classified with respect to seismic category; and (2) components that form an interface between SC-I and non SC-I components should be classified as SC-I.

As clarification: Conventional Seismic (CS) category is applied to the fluid transport system components that are not classified SC-I and SC-II. Additionally, components that form an interface between SC-I and non-SC-I components are indeed classified as SC-I; Section 11.8.7 in the CAR will be updated at the next revision to clarify this point.

Pending Changes

11.8-4. Table 11.8.5, pg 11.8-11, Design Bases for the Fluid Transport Systems, will be updated in the upcoming CAR amendment to be consistent with the applicable code practices (ASME Section VIII for welded equipment and B31.3 for piping systems) and design basis information for process and fluid systems.

DCS Comments on Draft SER

Section 11.9, Fluid Systems

Clarification/Correction of Statements:

11.9-1. Section 11.9.1.1, pgs 11.9-6 and -7, discusses various functions of the nitrogen system that the staff presumes should be safety functions. DCS reiterates that the nitrogen system is not a PSSC, and acknowledges the open items associated with this discussion. Specific to the "containment" function of the calciner furnace bearing, however, comments 5-8 (last bullet) and 11.2-8 clarify that this is not a safety function, consistent with the DCS response to RAI 207[4]. Additionally, specific to the nitrogen system's mitigation of glovebox fires, comments 7-9 and 11.4-1 clarify that nitrogen eliminates adverse effects of atmospheric oxygen on the process or fuel as an operational or fuel quality issue, and that prevention or mitigation of gloveboxes is a collateral benefit that is not credited as a safety function[5].

11.9-2. Section 11.9.1.1, 2nd paragraph, pg. 11.9-3, states: "The fan coils are located "upstream" of the building intake HEPA filters to avoid the possibility that reverse airflow could contaminate the HVAC chilled water system." This should be changed to: "The primary ventilation cooling coils are located "upstream" of the building intake HEPA filters, thereby placing them outside of the building radiological boundary. Placing them in this location allows the condensate formed to be discharged directly."

11.9-3. Section 11.9.1.1, 4th paragraph, page 11.9-3, states: "Each supply line contains a day tank, transfer pump and strainer, discharge check, pressure relief, and isolation valves that are PSSCs, a common in-line fuel filter, and instrumentation." This statement should be changed to: "Each supply line has its own storage tank, transfer pump, day tank, purification system, strainers, filters, instrumentation and control elements, and piping." There are no common in-line filters and each supply line contains a dedicated main storage tank. Each supply line is a completely separate and independent subsystem containing its own storage tank, transfer pump, day tank, purification system, filters, strainers, instrumentation and controls and piping.

11.9-4. Section 11.9.1.2, 3rd paragraph , pgs 11.9-8 and -9, discusses the design basis for seismic isolation valves. From these discussions (and use of "all" in the first sentence), one could infer that even firewater lines have seismic isolation valves,

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[4] The DSER, at the bottom of pg 11.9-6, accurately captures DCS' position that these functions are "operational aspects" of the design that are not credited as safety functions.

[5] As indicated above, there are many operational features of the MFFF that are not credited as safety functions.

which is not correct. Firewater lines do not have seismic isolation valves in order to ensure firewater remains available after a seismic event.

Chapter 12, Human Factors Engineering for Personnel Activities

Clarification/Correction of Statements:

12-1. Section 12.1.1, pg 12.0-2, paragraph beginning with "In Reference 12.3.3 RAI 224…", next-to-last sentence, reads "In DSER References 12,3,4 [sic - commas should be periods] and 12.3.5, RAI 232, the applicant also stated that NUREG-0700 and all the NUREG/CR references in chapter 12.0 of NUREG/CR-1718 would be used as appropriate as part of the application..." In the response to RAI 232, however, DCS stated that "DCS will use the cited NUREG/CR reports as *guidance*" [emphasis added].

DCS Comments on Draft SER

Chapter 15, Management Measures

Clarification/Correction of Statements:

15-1. Section 15.2.2, 1st paragraph, pg 15.0-7, refers to "analysis and independent safety review of any proposed activity involving SSCs." This language is not consistent with the requirements in 10CFR70.72, which requires a review of facility changes but does not require an "independent safety review."

15-2. Section 15.6.1.1, 5th paragraph, pg 15.0-19: After "including immediate correction" add "where feasible."

DCS Comments on Draft SER

Editorial Comments

Note: DCS has not conducted a rigorous editorial review nor attempted to provide rigorous comments in this regard; the following editorial comments were the result of observations made during the technical review whose results are reflected in the remainder of this letter.

E-1. General – DCS observes that a number of cross-reference citations are apparently incorrect (e.g., References 1.1.3.2 on pg 1.1-3; 1.3.3.15 on pg 1.3-2; 1.3.3..10 and 1.3.3.1 on pg 1.3-7; 1.3.3.10 on pg 1.3-12; etc.).

E-2. Section 1.1.1.2, pg 1.1-6 – Change "effluent" to "waste streams." "Effluent" typically refers to releases to the environment (e.g., Criterion 60 of 10 CFR 50 Appendix A); as indicated in the following sentence, no radioactive liquid is released from the MFFF to the environment.

E-3. Section 1.1.1.3.2, pg 1.1-8 – Change parenthetical "uranium and MOX fuel" to "uranium *or* MOX fuel"

E-4. Section 1.3.1.1, pg 1.3-2, 2nd paragraph – Change "Area F" to "F Area"

E-5. Section 1.3.1.5.5, pg 1.3-12, 5th paragraph – Change "124 miles" to "75 miles"

E-6. Section 5.1.5.2, pg 5.0-21 (Fire Affecting Facility Wide Systems) and pg 5.0-22 AP/MP C3 Glovebox) – Change "is expected to occur" to "is postulated to result" for consistency and to avoid the incorrect perception that these events are expected.

E-7. Section 5.1.4, Pg 5.0-3, 2nd Paragraph, Reference 5.3.7 as cited is a DCS response to NRC request for additional information on the MOX Project Quality Assurance Plan (MPQAP) Revision 2. The correct reference is:

Hastings, P.S., Duke Cogema Stone & Webster, letter to U.S. Nuclear Regulatory Commission, RE Response to Request for Additional Information – Construction Authorization Request, August 31, 2001.

E-8. Section 5.4.1.3, pg 5.0-6, Process Hazards Methodology, the section number is out of sequence, it should be 5.1.4.3

E-9. Section 5.1.5.2, pg 5.0-11, 1st bullet, and DSER Section 5.1.5.3, pg 5.0-12, 2nd paragraph. "OL" should be changed to "license." Generic comment.

E-10. Section 5.1.5.2, pg 5.0-11, 2nd bullet. Line 3 – Change "can the" to "can withstand the"

E-11. Section 5.1.5.3 appears on page 5.0-11 [Internal Process hazard Events Results] and again on page 5.0-22 [Load Handling Events]

DCS Comments on Draft SER

Editorial Comments

E-12. In Table 5-1 of the DSER, pg 5.0-36, refers to DSER section 11.7.1.3. This should be DSER 11.7.1.2.

E-13. Table 5-1 of the DSER , the reference to DSER Section 11.6.1.3.2 is not a section in the DSER. It is possibly 11.6.1.3.1.

E-14. Table 5-1, general note: Section 11.4.5.2 cited in column 3 does not exist in the text and should be reviewed for correct section number.

E-15. Table 5-1, pg 5.0-36, C2 Confinement System passive Barrier, Add: ", except heat removal is by air flow dilution." After "System design in accordance with Regulatory Guide 3.12." to match other confinement systems.

E-16. Table 5-1, pg 5.0-39, Criticality Control, Note 1, 2nd sentence should read: "Nuclear Criticality shall be made highly unlikely."

E-17. Section 6.1.3.3, pgs 6.0-7, last bullet on page and pg 6.0-8, first bullet on page – both bullets should be subordinate to the next-to-last bullet on pg 6.0-7.

E-18. Section 6.1.3, pg 6.0-4, states that "Design basis information includes…technical practices related to determination of criticality safety limits, including calculational methods and criticality code validation." Because of past confusion regarding the need for submittal of validation reports for construction authorization, DCS suggests changing the above language to: "Design basis information includes…technical practices related to determination of criticality safety limits, (practices include calculational methods and criticality code validation methods)."

E-19. Section 6.1.3.4.2, pg 6.0-11, NCS – MP, DSER states: "The master blend has a composition of $\leq$ 22wt percent Pu; the final blend consists of $\leq$ 6.3wt percent Pu." As a general note, it should be understood that these are the conservative modeled values for maximum Pu content used in criticality safety analyses. In practice, the master blend has a nominal composition $\leq$ 20 wt. % Pu and the final blend $\leq$ 6 wt. % Pu.

E-20. Section 7.1.5.3, pg 7.0-13, 4th bullet, replace "ventilator" with "ventilated."

E-21. Section 8.1.2.1.1, pg 8.0-2 states that in the first paragraph that "supported by reagent preparation in Reagent Processing Building." This should state that "supported by reagent preparation in the Reagent Processing Building (BRP) and the AP Processing Building (BAP).

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E-22. Section 8.1.2.1.3, 2nd paragraph, pg 8-7: Hydrazine is stored as hydrazine hydrate in the BRP as indicate in Table 2 in the response to CAR RAI 113. Bullet indicating storage of N_2H_4 in drums should be clarified.

E-23. Section 9.1.1.4.2, pg 9.0-10 2nd paragraph, 5th sentence, it is stated "Therefore, the methodology for deriving source terms that was presented by the applicant has not been accepted by the staff and is considered an open issue." This open issue is not addressed in Section 9.2, however, it is listed in appendix A under section 11.4 as open item VS-1. A cross reference in Chapter 9 to VS-1 should be added to the paragraph on page 9.0-10.

E-24. Section 10.2 refers to Section 10.2.3.2. This is a typographical error that should be corrected to reference section 10.1.3.2.

E-25. Section 11.1.1.3.2.3, pg 11.1-10, 4th paragraph, change "recompaction indices" to "recompression indices" in all three locations.

E-26. Section 11.1.1.3.2.3, pg 11.1-11, 1st paragraph, 1 sentence, Add "PC-3+" before the words "design basis ground motion…"

E-27. Section 11.4.1.1.1, pg 11.4-4, next to last bullet, first sentence. Safety should be safely.

E-28. Section 11.5.1.1.1, pgs 11.5-1 & 11.5-2, lists the ELECTRICAL SYSTEMS as supporting the very high depressurization exhaust systems and the C4 confinement system as if it were a separate system. The very high depressurization is part of the C4 confinement system.

E-29. Sections 11.5.1.3.1, pg11.5-6, and 11.5.1.3.2, pg 11.5-8, have a typographical error in the last sentence of the first paragraph ("extend" is used instead of "extent").

E-30. Section 11.6.1.1.2.5, pg 11.6-3, 2nd bullet. The term "AP control rooms" should not be plural. There is a single AP control room.

E-31. Section 11.6.1.1.2.6, pg 11.6-4, 2nd paragraph, 2nd sentence. The phrase "Sensors also provide input signals . . . " should read "These sensors also provide input signals . . ."

E-32. Section 11.6.1.1.2.10, pg 11.6-5, the computer aided diagnosis system. The text states, in part, ". . . to determine which process conditions have not been met". This is not exactly accurate; rather, the system determines the PLC failure condition. A more precise description would be ". . . to determine the state of the PLC when the problem occurred."

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E-33. Section 11.6.1.2, pg 11.6-6, System Interface. Probably it would be better to state that the control rooms provide ". . . the *primary* human system interface . . .", not just ". . .the human system interface. . ." as there are places where the operators interface with the system.

E-34. Section 11.8.1.1, pg 11.8-3, 4th paragraph, System Description, states "The fluid transport systems for the AP process are include the normal, protective, and safety control subsystems." Delete "are" from the sentence.

E-35. Section 11.8.1.3, pg 11.8-12, Design Basis of PSSCs, Evaluation of Redundancy and Diversity, states "The waste transfer line is double walled stainless steel piping with leak detection that is located in a trench routed away from heavy equipment areas and designed to withstand normal loads like dead loads (soil pressure) and live loads (wheel loads) and design basis earthquake event." This should be revised to state "The waste transfer lines for Stripped Uranium and High Alfa waste are double walled stainless steel piping….."

E-36. Section 11.9.1.1, page 11.9-7, 3rd paragraph. In the first sentence, the hydrogen/argon mixture should be referred to as argon/hydrogen mixture to be consistent with the rest of the paragraph. Argon is the predominant gas in the mixture. Also, in the 6th sentence of this paragraph, the term Argon/helium is used. This should be argon/hydrogen.

E-37. Section 11.9.1.1, page 11.9-8, 4th paragraph. The DSER states: "DCS states that the system is supplied by one tube trailer holding a 24-hour supply (45,000 ft3 (1300m3) of argon-methane gas)." This should be replaced with: "DCS states that the system is supplied by one tube trailer holding a 6-week supply (45,000 ft3 (1300m3) of argon-methane gas)."

E-38. Section 12.1.1, pg 12.0-2, paragraph beginning with "In Reference 12.3.3 RAI 224 . . . ", the title of IEEE 1023 is slightly garbled. The text reads: ". . .Std 1023, "IEEE Guidelines for the Application of Human Factors Engineering to systems and Equipment," and Facilities of Nuclear Power Generating Facilities, recognizing that there are . . ". The text should read as follows: ". . .Std 1023, "IEEE Guidelines for the Application of Human Factors Engineering to systems and Equipment and Facilities of Nuclear Power Generating Facilities", recognizing that there are . . ".

E-39. Section 12.1.1, pg 12.0-3, 3rd paragraph. The text reads as follows: "…D318 (train A) and D319 (train M)." The text should read "…D318 (train A) and D319 (train B)."

E-40. DSER Section 12.1.1, pg 12.0-3, last paragraph. The text reads as follows: ". February 11, 2002 letters from the applicant)) ..." The text should read: ". February 11, 2002 letters from the applicant) . . ."

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E-41. Section 15.6.1.1, pg 15.0-18, 2nd paragraph. The first sentence states "audits and assessments commensurate will be scheduled. . . ." After "commensurate" add "with importance to safety"

E-42. Section 15.6.1.2, pg 15.0-19, 1st paragraph. Words appear missing from the last sentence.

E-43. Section 15.8.1.3, pg 15.0-24, Continuing Records Management Provisions. Part of the first sentence appears to be missing or hidden. Please correct.

E-44. Open Item VS-1, p. A-6: error in cited number of 10E-4. The value should be 1E-4 or 10^{-4} for two banks of HEPA filters.