DUKE COGEMA
STONE & WEBSTER

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

30 May 2003
DCS-NRC-000141

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, Revision 1

Reference: Robert C. Pierson (NRC) letter to Robert H. Ihde (DCS) dated April 30, 2003, *Draft Safety Evaluation Report on Construction of Proposed Mixed Oxide Fuel Fabrication Facility, Revision 1*

Duke Cogema Stone & Webster (DCS) has reviewed the revised Draft Safety Evaluation Report (DSER) transmitted to DCS 30 April 2003 for technical accuracy. DCS appreciates the opportunity to review the revised draft and finds in general that the review of the CAR was comprehensive. DCS notes that a number of the open items reflected in Appendix A of the DSER have been subsequently closed by the Staff as a result of their continuing review of information submitted by DCS.

Enclosure 1 provides the results of DCS review of the revised DSER. It should be noted that Enclosure 1 is not a comprehensive list; but rather contains representative examples of items found within the revised DSER. DCS also has included in Enclosure 1 a set of editorial comments identified during the review. Note that DCS has not completed the review of Chapter 8 of the DSER. DCS expects to provide detailed comments on this chapter of the DSER following next week's scheduled meetings with NRC on chemical safety.

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

Sincerely,

K L Ashe for

Peter S. Hastings, P.E.
Manager, Licensing and Safety Analysis

PO Box 31847
Charlotte, NC 28231-1847

128 South Tryon Street, FC12A
Charlotte, NC 28202

MMSS01

Enclosure: DCS Comments on the Revised Draft Safety Evaluation Report

xc: David Alberstein, NNSA/HQ
Marc Arslan, DCS
Kenneth L. Ashe, DCS
David A. Ayres, USNRC/RII
Timothy S. Barr, NNSA/CH
Jean-Marc Belmont, DCS
Edward J. Brabazon, DCS
James R. Cassidy, DCS
Sterling M. Franks, III, NNSA/SR
Joseph G. Giitter, USNRC/HQ
Kathy H. Gibson, USNRC/HQ
Robert H. Ihde, DCS
James V. Johnson, NNSA/HQ
Eric J. Leeds, USNRC/HQ
J. David Nulton, NNSA/HQ
Andrew Persinko, USNRC/HQ
Robert C. Pierson, USNRC/HQ
Luis A. Reyes, USNRC/RII
Patrick T. Rhoads, NNSA/HQ
Donald J. Silverman, Esq., DCS
Brian W. Smith, USNRC/HQ
Thomas E. Touchstone, DCS
Martin J. Virgilio, USNRC/HQ
PRA/EDMS: Corresp\Outgoing\NRC\2003 NRC\DCS-NRC-000141

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 1 General Information

1-1. Section 1.1.1.1.1 , page 1.1-4 : First paragraph. The DSER states that before any possession and use license could be approved, the NRC staff would have to review and approve the DCS-DOE protocol agreement. DCS disagrees with this revised wording which was not contained in the original draft DSER. The NRC staff, under 10CFR70.23, must find that the controls are adequate, however, the regulations do not require that NRC "approve" the agreement entered into by DCS and DOE. It is not clear why this language has been revised from the original draft SER.

1-2. Section 1.1.1.2 , page 1.1-5 : First paragraph. In the 5th sentence, the DSER indicates that depleted uranium is inspected under the MC&A program. Although this is stated in the CAR, the requirements of 10CFR74 do not apply to source material for non-enrichment facilities. Depleted uranium is a source material not subject to the cited MC&A controls.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 2 Financial Qualification

2-1. Section 2.1.1 , page 2.0-2 : DCS notes that the open items on financial qualifications have now been closed by NRC in the Open Item Status Report issued 28 May 2003.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 5 Safety Assessment of the Design Basis

5-1. Section 5.5.1.3.6.4 , page 5.5-34 : "HAN Explosion" under the section labeled "1. Process Vessels Containing HAN and Hydrazine Nitrate Without NOx Addition." Should be revised to include hydrazine nitrate as a substance controlled under the PSSC chemical safety control. Hydrazine nitrate is now part of the safety strategy and should be included under the PSSC chemical safety control. This will change results listed in Section 5.1.6.3.4 "HAN (Explosion)" of the revised DSER. Refer to DCS letter of 30 May 2003, DCS-NRC-000140

5-2. Section 5.0 Table 5-1b , page 5.0-52 : Under the table entry "Fire, AP/MP C3 Glovebox Areas," Add "Facility Worker Controls" under column PSSC (facility worker).

5-3. Section 5.0 Table 5-2 , page 5.0-77 : Under the table entry "3013 Canister," DOE-STD-3013-1996 is not consistent with the CAR. CAR 11.4.11.3 states that canister will satisfy requirements of DOE-STD-3013-2000.

5-4. Section 5.0 Table 5-2 , page 5.0-80 : Under the table entry "Principal SSCs and Design Bases Functions and Values Developed from the Safety Assessment" under the PSSC "Chemical Safety Controls" and the Design Bases Safety Function "Ensure the valence of the plutonium prior to oxalic acid addition is not VI." DCS disagrees with the Design Bases Value of "Pressure limited to P_{max} plus 10%". This value is for Material Handling Controls (CAR 5.6.2.3) as reflected on DSER page 5.0-90.

5-5. Section 5.0 Table 5-2 , page 5.0-89 : Under the table entry "Principal SSCs and Design Bases Functions and Values Developed from the Safety Assessment" under the PSSC "Instrument Air System (Emergency Scavenging Air)." DCS disagrees with the Design Bases Value of "Initiated by low pressure alarms on bubbling air buffer tanks". DCS believes this is design information and is not listed as a design basis in the CAR (there will likely be additional/alternative means to detect loss of normal air supply).

5-6. Section 5.0 Table 5-2 , page 5.0-92 : Under the table entry "Principal SSCs and Design Bases Functions and Values Developed from the Safety Assessment" under the PSSC "Process Cell Fire Prevention Features." DCS disagrees with the Design Bases Value of "Maintain temperature to avoid formation of flammable vapors". This design basis value was not included in the cited CAR chapter for the design basis of this PSSC.

5-7. Section 5.0 Table 5-2 , page 5.0-93 : Under the table entry "Principal SSCs and Design Bases Functions and Values Developed from the Safety Assessment" under the PSSC "Process Safety Control Subsystem." The Design Bases Safety Functions "Control the N_2O_4 flowrate into the oxidation column" (page) and "Ensure the flow rate of nitrogen dioxide/dinitrogen tetroxide is limited to the oxidation column of the purification cycle" (page 5.0-95) are nearly the same (the CAR calls out only the second design basis safety function) with nearly the same design bases values. Delete one of the two design bases safety functions (recommend deleting one on page 5.0-93).

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 6 Nuclear Criticality Safety

6-1. Section 6.1.3.4.1 , page 6.0-8 : It is stated in the third paragraph on the page that "In the Decanning and Milling Units, powder density is controlled by upstream measurement by a variety of means (revised CAR Sections 11.3.2.1.2 and 11.3.2.2.2). For these units, density must be confirmed to be less than 7 g/cm^3." In most criticality control units in the Decanning and Milling Units, the assumption is made that the fissile material is at the maximum theoretical value of 11.46 g/cc (pages 6-49 -6-52) and thus the density does not need to be confirmed to be less that 7 g/cc. This should be changed to "In some of the Decanning and Milling Units,..."

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 7 Fire Protection

7-1. Section 7.1.2.1 , page 7.0-3 : DSER states that the "exterior walls of the MOX Fuel Fabrication Building (BMF) structure would not be load bearing, however, they would carry a minimum two hour fire rating in order to provide exposure protection." This statement mixes the purpose and fire resistance of the exterior wall of the BMF (which is load bearing and is credited with having fire resistance) with that of the security wall that surrounds the BMF (which is not load bearing and is not credited with having fire resistance). Therefore, this statement should be revised to state that the "exterior load bearing walls of the MOX Fuel Fabrication Building (BMF) structure carry a minimum two hour fire rating in order to provide exposure protection."

7-2. Section 7.1.2.1 , page 7.0-3 : DSER states that "the Secured Warehouse building (BSW) contains PSSCs because of the amount of depleted uranium it contains. (Open item CS-08 provides a discussion). Accordingly, the BSW would be Type I construction." This statement is not correct because the BSW does not contain any tangible PSSCs and is not of Type I construction (it is of Type II construction), although there are PSSCs that apply to it. As stated in the revised DSER Sections 5.1.6.3.6 and 8.1.2.3.3, the PSSCs that apply to the BSW are facility worker actions and combustible loading controls. Therefore, this statement should be revised to state "the facility worker actions and combustible loading controls PSSCs apply to the Secured Warehouse building (BSW) because of the amount of depleted uranium it contains. (Open Item CS-08 provides a discussion)."

7-3. Section 7.1.2.1 , page 7.0-3 : DUO2 in the warehouse should not be a Part 70.61 performance criteria concern subject to the development of PSSCs. Depleted uranium is regulated under Part 40 as source material. The requirements for identification of PSSCs and IROFS are unique to Part 70 special nuclear material.

7-4. Section 7.1.2.9 , page 7.0-7 : Second paragraph. DCS has provided a resolution to the open item (FS-2) relating to the margin of safety of fire barriers by separate letter dated May 14, 2003. DCS believes this response is sufficient to close this open item and conclude that the fire barrier design basis is adequate.

7-5. Section 7.1.2.11 , page 7.0-8 : DSER 4th paragraph states that "automatic suppression features are not provided in areas such as Rod Storage, where they would be difficult to maintain operational due to ALARA concerns." This statement is not correct because although automatic suppression is not provided in Rod Storage, ALARA concerns are not utilized as a reason for this area. In fact, ALARA concerns are not utilized as a reason for not providing automatic suppression. However, Section 7.5.1 of the updated CAR does identify operational constraints as a reason for not providing automatic suppression in some areas. Therefore, for consistency with Section 7.5.1 of the updated CAR, this statement should be revised to state "automatic suppression features are not provided in areas such as solvent cells, where they would be difficult to maintain operational due to the inability to inspect these areas on a routine basis."

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 7 Fire Protection

7-6. Section 7.1.2.11 , page 7.0-9 : DSER, 5th paragraph, states that "a dry standpipe system instead of the normally pressurized wet standpipe is provided in the MP and AP areas." This statement has not been revised to reflect the information provided in the updated CAR, which included the standpipes in the Shipping & Receiving (S&R) as being dry. Therefore, this statement should be revised to state "a dry standpipe system instead of the normally pressurized wet standpipe is provided in the MP, S&R, and AP areas."

7-7. Section 7.1.2.12 , page 7.0-9 : In the fourth line, the cited Reference 7.3.9.1 does not address the combustibility of uranium dioxide.

7-8. Section 7.1.5.4 , page 7.0-14 : DSER, 1st paragraph, states that "some facility structures are identified as PSSCs. They are the BMF structure, the Emergency Diesel Generator Building (BEG) structure, the Emergency Control Room Air-Conditioning System (ECRAS) and the waste transfer line." This statement is not correct because the ECRAS is not a facility structure but rather a collection of HVAC components located within the Shipping & Receiving Area. Therefore, this statement should be revised to state "some facility structures are identified as PSSCs. They are the BMF structure, the Emergency Diesel Generator Building (BEG) structure, and the waste transfer line."

7-9. Section 7.1.5.4 , page 7.0-15 : DSER, 3rd paragraph, provides a discussion of the ECRAS being considered as a PSSC facility structure. As discussed in the preceding comment, the ECRAS is not a facility structure. Therefore, this paragraph needs to be deleted in its entirety.

7-10. Section 7.1.5.6 , page 7.0-17 : DCS has provided a resolution to the open item (FS-2) relating to the margin of safety of fire barriers by separate letter dated May 14, 2003. DCS believes this response is sufficient to close this open item and conclude that the fire barrier design basis is adequate.

7-11. Section 7.1.5.7 , page 7.0-17 : DSER, second paragraph, states "Heat or smoke detectors are provided in gloveboxes. Detection systems in these locations are designated PSSCs." This statement is not correct since the only fire detection systems that are PSSCs are those associated with automatic fire suppression systems that protect fire areas (gloveboxes are <u>not</u> fire areas) containing dispersible radioactive material as defense in depth to the fire barriers of the fire area. Therefore, the second sentence of this statement should be revised to state "Detection systems associated with automatic fire suppression systems that protect fire areas containing dispersible radioactive material are designated PSSCs."

7-12. Section 7.3.4.4, 7.3.4.5, and 7.3.4.13 , page 7.0-18 and 7.0-19 : These sections of the DSER list NFPA 20, 22, and 69 as references, but these codes are not part (explicitly or implicitly) of the MFFF fire protection design basis and they are not mentioned within the body of Chapter 7 of the revised DSER. Therefore, these codes should be removed from the reference list.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 8 Chemical and Process Safety

8-1. Section 8.1.2.1 , page 8.0-3 : DSER, 3rd paragraph, states the "Reagent Processing Building would be located adjacent to the main MFFF building." This statement is not correct since these buildings, although they are near one another, are not adjacent to one another. In fact, the only MFFF buildings that are adjacent to one another are the Technical Support Building and the BMF. Therefore, to clarify the representation of the location of these two buildings to one another, "adjacent to" should be changed to "near."

8-2. Section 8.1.2.1 , page 8.0-3 : DSER, 4th paragraph, provides a brief discussion of the BSW and concludes by stating the BSW "building would not have filters or any other special features for radioactive materials." This discussion appears to not have incorporated the fact that the steel drums containing depleted uranium oxide powder that are inside the BSW are located within their own 2-hour fire-resistant room within the BSW. The features of the depleted uranium storage room (and the BSW as a whole) were provided previously in response to RAI 106 on 31AUG01. Without incorporating the information provided in response to RAI 106, one could improperly infer that the depleted uranium oxide drums are stored in a relatively unprotected location within the BSW. Therefore, as a minimum, the BSW discussion should be abbreviated to state that the BSW "building would not have filters."

8-3. Section 8.1.2.1 , page 8.0-3 : Second paragraph: The DSER states that "Liquid chemical containers would be located inside curbed areas to contain accidental spills." This statement should be clarified as follows: "Liquid chemical containers would be located inside curbed areas or sumps would be provided to contain accidental spills."

8-4. Section 8.1.2.1 , page 8.0-3 : First paragraph on page. The second sentence is in disagreement with the information that follows that indicates that waste chemicals that could be slightly radioactive would be stored in the Reagents Building (this is correct).

8-5. Section 8.1.2.3.1 , page Entire Section : As stated in 5.1.3,

> "Duke, Cogema, Stone & Webster (DCS) provided chemical concentration limits to evaluate the potential consequences to the public and workers for an accidental release of chemicals. The applicant based these limits on the Acute Exposure Guideline Level (AEGL) values and the Emergency Response Planning Guideline (ERPG) values. For chemicals which do not have AEGL or ERPG value, limits are based on Temporary Emergency Exposure Limits (TEELs) adopted by the U. S. Department of Energy (DOE), Subcommittee on Consequence Assessment and Protective Action (SCAPA). A discussion of the chemical consequences and the applicant's consequence analysis is provided in Section 8.1.2.3 of the revised DSER. A summary of the staff's review of chemical events is provided in Section 5.1.6.3.6 of the revised DSER."

This description in 5.1.3 does not match the description in 8.1.2.3.1.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 8 Chemical and Process Safety

8-6. Section 8.1.2.1.4 , page 8.0-6 : Nitrogen tetroxide is stored in liquefied form in the Reagent Processing Building, where it is evaporated to form nitrogen dioxide gas. It does not appear that this section of the DSER has been revised to reflect the revised CAR list of chemicals.

8-7. Section 8.1.2.3.3 , page 8.0-17 : The DSER states: "Concentration controls are applied to hydrazine and peroxide deliveries. Concentration controls are not applied to the other reagents and the delivery and storage of higher concentration reagents is a credible event. This is primarily a concern with nitric acid. An increase from 13.6 N (about 63 percent) to 80-90 percent due to a delivery mistake would increase the vapor pressure by a factor of 5-10 for nitric acid."

In the response to RAI 211, DCS stated the following about nitric acid receipt and processing. "Nitric acid is received in the warehouse in a tote tank (DOT approved shipping container) containing a certified concentration of 63 Wt. % (13.6 N), which is well below 94.5 % concentration considered to be toxic and reactive per 29 CFR 1910.119 Appendix A. Using procedures, the incoming concentration of nitric acid will be confirmed by independent testing prior to delivery to the reagents building for storage and use. Using volumetric totalizers, the 13.6N nitric acid will be diluted with demineralized water to form 6 N and 1.5 N nitric acid solutions. Again, as part of the procedure, the prepared solution will be redundantly confirmed before use in the AP process. These administrative controls will ensure that the Nitric Acid concentration does not exceed 94.5 Wt. % either in the reagents building or the BAP."

8-8. Section 8.1.2.3.3 , page 8.0-18 : The DSER states: "The applicant has reduced air flow velocities (to 0.1 and 0.01 m/sec) used to determine evaporations rates in some areas of the facility well below the wind speed used in the dispersion analyses (2.2 m/sec). Use of the 2.2 m/sec wind speed would result in nitric acid concentrations exceeding levels of concern. No PSSCs are identified."

Use of the 2.2 m/sec outdoor wind speed could result in nitric acid concentrations exceeding levels of concern only for an outdoor spill (with no retention basin) of elevated temperature (i.e., greater than 50 C) 13.6 N nitric acid. This is not a credible scenario for a spill of elevated temperature nitric acid inside the BAP.

8-9. Section 8.1.2.4.1 , page 8.0-18 : Second paragraph. DCS disagrees with the DSER statement that for a 100-200 gallon leak of radioactive nitrate solution, site worker limits could be exceeded for several hundred meters, and the performance requirements ... might not be met.

Indoor releases of nitric acid at elevated temperature have been evaluated (up to 500 liters of 13.6 N HNO3 and 120 C in the KPC unit) and do not exceed the performance requirements of 10 CFR 70.61, when using an appropriate representative indoor air speed and/or leaks into a retention basin.

8-10. Section 8.1.2.4.1 , page 8.0-19 : Last paragraph. DCS disagrees with the assertion in the DSER that the use of wind speeds representative of the location of the spill and representative of the dispersion (i.e., indoor or outdoors) is an uncommon practice. It is entirely appropriate and common to utilize the conditions that exist consistent with the location of the event.

8-11. Section 8.1.2.4.1 , page 8.0-20 : The DSER states that because DCS does not consider input parameters to a calculation to be design basis values, a safety effect is credited without identification of PSSCs and design basis. DCS disagrees with this conclusion and assertion. The NRC has already stated for MFFF that the definition of design basis is that contained within 10CFR50.2. This definition states that: "...information which identifies the specific functions to be performed by a structure, system, or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may be (1) restraints derived from generally accepted "state-of-the-art" practices for achieving functional goals, or (2) requirements derived from analysis (based on calculations and/or experiments) of the effects of a postulated accident for which a structure, system, or component must meet its functional goals."

The indoor windspeed value assumed in the analysis is a parameter used as part of supporting design analysis. The airflow in the rooms being analyzed was not established on the basis of this calculation, and therefore, does not meet item 2 of the definition. That is, the room airflow was not established as a result of analyses to ensure that the chemical consequences goals were met. The indoor airspeed is also not a controlled parameter. It is a fixed value based on the volume of the room, size of the ductwork, and capacity of the fans. The airflow in the rooms is also not a "reference bounding value" established for chemical releases. The value is established based on standard HVAC design considerations to maintain the room at a negative pressure and provide adequate room ventilation. Therefore, the value does not meet the other tests of this design basis definition. NEI 97-04 has been widely recognized by NRC as an industry standard for development of design basis programs and the NRC has specifically endorsed Appendix B of this standard in Regulatory Guide 1.186. The conclusion suggested by the staff in the DSER that the input parameter of airflow in the room is a design basis value for chemical consequences is not supported by either of these documents nor by accepted industry practice. A review of the examples provided in Appendix C to NEI 97-04 shows that this calculation is clearly an example of supporting design information.

The staff's assertion that a "safety effect" is being credited is not accurate. There is no safety credit being given for the operation of the ventilation system for this analysis. In fact, if the ventilation system were not operating, there would be essentially no appreciable release. The ventilation airflow was modeled into the analysis because DCS expects the system to be in operation. Therefore, it is appropriately considered within the analytical model. Open Item CS-5b addresses the indoor wind speed.

8-12. Section 8.1.2.5.1.1 , page 8.0-22 : The DSER states that the mixture is nonexplosive argon (95 percent) and hydrogen (5 percent) with a maximum H2 < 9

percent. The text should be changed to "The mixture is non explosive with a maximum concentration of 5 percent hydrogen and a minimum of 95 percent argon."

8-13. Section 8.1.2.5.2 , page 8.0-23 : DSER, 1st paragraph, states that the "solvent-diluent in these processes is flammable and could be involved in a fire." 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."

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 9 Radiation Safety

9-1. Section 9.1.1.4.2 , page 9.0-10 : The discussion in the paragraphs on page 9.0-10 relating to the leak path factor of 10^{-4} has been resolved with the staff (as noted in May 28, 2003 Open Item Status Report) and should be revised to reflect the acceptability of the use of 10^{-4}.

9-2. Section 9.1.2.1 , page 9.0-12 : Second paragraph. The DSER states that the applicant did not identify PSSCs or management measures relating to the ALARA program. It also states that regulations require this to be addressed in the possession and use license application. There are no regulations in 10CFR70 that require PSSCs be established to meet ALARA goals. PSSCs (IROFS) are required to meet 70.61 performance requirements, which are accidents. Management measures ensure that PSSCs (IROFS) will be available to function when required. This paragraph, as written, suggests a connection between 10CFR71.61 performance requirements, PSSCs, and management measures to the ALARA program which does not exist. DCS acknowledges the importance of the ALARA program and the requirements to comply with 10CFR20. However, the compliance with the regulations in 10CFR20 does not result in PSSCs (IROFS) under the 10CFR70.61 performance requirements.

9-3. Section 9.1.2.4 , page 9.0-13, 14 : The DSER states that the applicant did not identify PSSCs or management measures relating to the airborne radioactivity monitoring program. It also states that Part 20 and 70 regulations require this to be addressed in the possession and use license application. There are no regulations in 10CFR70 that require PSSCs be established for the airborne radioactivity monitoring program. PSSCs (IROFS) are required to meet 70.61 performance requirements, which are accidents. Management measures ensure that PSSCs (IROFS) will be available to function when required. This paragraph, as written, suggests a connection between 10CFR71.61 performance requirements, PSSCs, and management measures to the airborne radioactivity monitoring program which does not exist. DCS acknowledges the importance of the airborne radioactivity monitoring program and the requirements to comply with 10CFR20. However, the compliance with the regulations in 10CFR20 does not result in PSSCs (IROFS) under the 10CFR70.61 performance requirements.

9-4. Section 9.1.2.5 , page 9.0-14 : The DSER states that the applicant did not identify PSSCs or management measures relating to the contamination control program. It also states that Part 20 and 70 regulations require this to be addressed in the possession and use license application. There are no regulations in 10CFR70 that require PSSCs be established for the contamination control program. PSSCs (IROFS) are required to meet 70.61 performance requirements, which are accidents. Management measures ensure that PSSCs (IROFS) will be available to function when required. This paragraph, as written, suggests a connection between 10CFR71.61 performance requirements, PSSCs, and management measures to the contamination control program which does not exist. DCS acknowledges the importance of the contamination control program and the requirements to comply with 10CFR20. However, the compliance with the regulations in 10CFR20 does not result in PSSCs (IROFS) under the 10CFR70.61 performance requirements.

9-5. *Section 9.1.2.8 , page 9.0-16 :* This text states that the applicant did not identify PSSCs or management measures relating to the instrumentation calibration and maintenance program. It also states that Part 20 and 70 regulations require this to be addressed in the possession and use license application. There are no regulations in 10CFR70 that require PSSCs be established for the instrumentation calibration and maintenance program. PSSCs (IROFS) are required to meet 70.61 performance requirements, which are accidents. Management measures ensure that PSSCs (IROFS) will be available to function when required. This paragraph, as written, suggests a connection between 10CFR71.61 performance requirements, PSSCs, and management measures to the instrumentation calibration and maintenance program which does not exist. DCS acknowledges the importance of the instrumentation calibration and maintenance program as an element in the overall radiation protection program which complies with 10CFR20. However, the compliance with the regulations in 10CFR20 does not result in PSSCs (IROFS) under the 10CFR70.61 performance requirements.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 10 Environmental Protection

10-1. Section 10.1.2 , page 10.0-4 : First paragraph. The DSER states that the applicant did not identify PSSCs or management measures relating to the operational effluent and environmental monitoring program. It also states that Part 20 regulations require this to be addressed in the possession and use license application. There are no regulations in 10CFR70 that require PSSCs be established for effluent monitoring. PSSCs (IROFS) are required to meet 70.61 performance requirements, which are accidents. Management measures ensure that PSSCs (IROFS) will be available to function when required. This paragraph, as written, suggests a connection between 10CFR71.61 performance requirements, PSSCs, and management measures to the effluent monitoring program which does not exist. DCS acknowledges the importance of the effluent monitoring program and the requirements to comply with 10CFR20. However, the compliance with the regulations in 10CFR20 does not result in PSSCs (IROFS) under the 10CFR70.61 performance requirements.

10-2. Section 10.1.1.2 , page entire section : The DSER discusses facility PSSCs and their design bases as part of the discussion of ALARA effluent controls. There are no regulations in 10CFR70 that require PSSCs be established to meet ALARA goals. PSSCs (IROFS) are required to meet 70.61 performance requirements, which are accidents. Management measures ensure that PSSCs (IROFS) will be available to function when required. This paragraph, as written, suggests a connection between 10CFR71.61 performance requirements, PSSCs, and management measures to the ALARA program which does not exist. DCS acknowledges the importance of the ALARA program and the requirements to comply with 10CFR20. However, the compliance with the regulations in 10CFR20 does not result in PSSCs (IROFS) under the 10CFR70.61 performance requirements.

10-3. Section 10.1.1.4 , page 10.0-4 : Second paragraph. The DSER states that the applicant did not identify PSSCs or management measures relating to the operational ALARA program. It also states that regulations require this to be addressed in the possession and use license application. There are no regulations in 10CFR70 that require PSSCs be established to meet ALARA goals. PSSCs (IROFS) are required to meet 70.61 performance requirements, which are accidents. Management measures ensure that PSSCs (IROFS) will be available to function when required. This paragraph, as written, suggests a connection between 10CFR71.61 performance requirements, PSSCs, and management measures to the ALARA program which does not exist. DCS acknowledges the importance of the ALARA program and the requirements to comply with 10CFR20. However, the compliance with the regulations in 10CFR20 does not result in PSSCs (IROFS) under the 10CFR70.61 performance requirements.

10-4. Section 10.1.1.5 , page 10.0-4 : In the second paragraph under 10.1.1.5 Waste Minimization, the last sentence reads: "recovery, silver recovery, and solvent regeneration." DCS has removed the silver recovery process so it is no longer a waste minimization practice.

10-5. Section 10.1.2.3 , page 10.0-7 : The DSER incorrectly interprets the information presented in the CAR as a commitment to maintain two redundant continuous air

monitors (CAMs) and two fixed airborne particulate matter samplers to monitor facility air effluent. The information concerning redundant CAMs and airborne particulate matter samplers in the CAR was descriptive. DCS commits to maintaining an operable continuous sample collection system as described in Regulatory Guide 4.16, *Monitoring and Reporting Radioactivity in Releases of Radioactive Material in Liquid and Gaseous Effluents From Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants.* DCS may comply with the Regulatory Guide 4.16 requirements either by installing a continuous sample collection device or by the use of a CAM.

10-6. Section 10.1.3.2 , page 10.0-9 : The NRC use of GENII instead of MACCS2 is inappropriate. The EPA Science Advisory Board in their evaluation of the GENII model for EPA use noted that, "The conservative nature of the code may lead to excessively conservative dose estimates (i.e., higher than more realistic assumptions might produce), resulting in unnecessarily costly controls and unnecessary expenditures in site cleanup operations." On page 10 of their report, the SAB specifically notes that, "... the straight-line Gaussian and Lagrangian-puff models were designed for 'well-behaved' pollution transport from chimney 'stacks' and do not apply to more critical scenarios involving fires, explosions and accidental or terrorist aerial releases of contaminants, which the EPA may be called on to evaluate. (emphasis added)" The NRC Staff used the GENII model for exactly the types of accidents that the SAB specifically noted the model should not be used.

The use of the GENII computer code to calculate X/Q values for a single specific direction, without consideration of any other directions will not produce a site-representative 95th X/Q. For the specific direction selected by the NRC (i.e., the direction with the nearest boundary to the MFFF), the X/Q appears to be a factor of approximately 4.5 greater than the 95th X/Q established from MACCS2.

This difference results in a factor of 4.5 increase in the reported dose consequences which DCS believes is not representative of a 95th percentile result. In fact, the X/Q calculated by GENII in this one direction (NW) results in a value greater than the 99.5th X/Q calculated by MACCS2. This is likely a result of two differences in these codes:

- The aforementioned difference in establishing a site-representative X/Q (i.e., a result based on an analysis of a single direction vs. a result considering values from all directions).

- The decoupling of the sequential hourly meteorological data measurements by GENII, which uses joint frequency data instead, that may allow for unfavorable meteorological conditions to occur for unrealistic durations (i.e., conditions which may occur several times a year, but not several hours in a row, and that produce large X/Q's may be considered to occur within a single analysis period by GENII).

Consideration of these differences, leads DCS to believe that the results from GENII are overly conservative and not representative of a 95th percentile result.

DCS recommends that a well-established accident consequence code with a strong QA record, such as NRC sponsored MACCS2, be used.

10-7. Section 10.1.3.2 , page Table 10.1-3 and page 10.0-10 : The discussion in the table and two paragraphs on page 10.0-10 relating to the leak path factor of 10^{-4} has been resolved with the staff and should be revised to reflect the acceptability of the use of 10^{-4}.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 11 Plant Systems

11.0-1. Section 11.1, 11.2, 11.3, 11.5, 11.6, 11.11, 11.12, 14.0 : These include:

Section 70.64 of 10 CFR requires that baseline design criteria (BDC) and defense-in-depth practices be incorporated into the design of new facilities. With respect to structural systems, 10 CFR 70.64(a)(2) requires that the Mixed Oxide (MOX)Fuel Fabrication Facility (MFFF or the facility) design "provide for adequate protection against natural phenomena with consideration of the most severe documented historical events for the site." However, for the construction authorization, 10 CFR 70.23(b) states that the design bases of the PSSCs and the quality assurance program be found to provide reasonable assurance of protection against natural phenomena and the consequences of potential accidents. That is, the BDC must be met in the design, not necessarily in the design bases for the CAR.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 11.1 Civil Structural Systems

11.1-1. Section 11.1.3.2.3 , page 11.1-10 : Explosive Loads for SC-I Structures – The reference to the dynamic external over pressure of 10 psi, as a design basis threshold pressure for the design of SC-I Structures, is inconsistent with CAR Sec. 5.5.2.7.6.2. The wording in the DSER appears to be a hold over from CAR, Rev. 0, which was replaced with a design basis to determine the peak pressures and show that the structures could with stand the pressures in the LA. CAR Sec. 5.5.2.7.6.2 defines the appropriate approach.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 11.2 Aqueous Polishing Process and Chemistry

11.2-1. Section 11.2.1.1 , page 11.2-2 : Second paragraph. Change to "... conversion facility (PDCF) and Alternate Feedstock (AFS) at Savannah River Site (SRS) and to remove the impurities from the feed plutonium from the PDCF and AFS for use in the MP process."

11.2-2. Section 11.2.1.2.1 , page 11.2-3 : Second dash under second paragraph. Change to "...the reusable can is fed ~~returned to the Decanning Unit for feeding~~ into the dosing hopper"

11.2-3. Section 11.2.1.2.2 , page 11.2-4 : First paragraph. Change to "If the chlorides concentration is found to exceed 500 micrograms/gram of Pu (500 ppm), the powder is directed to the feeding hopper for one of the two dechlorination ~~hoppers~~ electrolyzers (KDD unit)"

11.2-4. Section 11.2.1.2.4 , page 11.2-4 : Second paragraph. Change to "Consequently, an ~~initial~~ isotopic dilution to around 30 percent assay is made by feeding the appropriate quantity of depleted uranium nitrate solution (0.25 percent U-235) to the ~~receiving~~ dilution and sampling tank. Other adjustments (e.g., acidity) may also be made to the solution in the ~~receiving~~ dilution and sampling tank to optimize subsequent purification of the plutonium."

11.2-5. Section 11.2.1.2.5 , page 11.2-4 : First paragraph, the electrolyzers between the two dissolution units are all the same size (batch sizes are different depending on the feed).

11.2-6. Section 11.2.1.2.6 , page 11.2-5 : First paragraph. Change to "The Purification Cycle also ~~controls~~ sends the solvent ~~and diluent~~ streams to the Solvent Recovery Cycle and the raffinate stream to the Acid Recovery Unit."

Additionally, the bulleted list in the DSER does not match the revised CAR.

11.2-7. Section 11.2.1.2.8 , page 11.2-6 : Last sentence on page. Solutions are transferred by air lifts and flow control valves as described in CAR 11.3.2.8.2.

11.2-8. Section 11.2.1.2.11 , page 11.2-8 : Equations 11.2-19 and 11.2-20 should read as:

$$3\text{Pu(III)} + \text{HNO}_3 + 3\text{H}^+ \rightarrow 3\,\text{Pu(IV)} + \text{NO} + 2\text{H}_2\text{O}$$

$$3\ \text{Pu(IV)} + 2\ \text{H}_2\text{O} \xrightarrow{\text{Mn}^{2+}} 2\ \text{Pu(III)} + \text{PuO}_2^{2+} + 4\ \text{H}^+$$

11.2-9. Section 11.2.1.2.11 , page 11.2-8 : Equations 11.2-17 and 11.2-18 should read as:

$$\text{Pu}(\text{C}_2\text{O}_4)_2 + 4\ \text{HNO}_3 \xrightarrow{\text{Mn}^{2+}} \text{Pu}(\text{NO}_3)_4 + 2\ \text{H}_2\text{C}_2\text{O}_4$$

$$\text{H}_2\text{C}_2\text{O}_4 + 2\ \text{HNO}_3 \xrightarrow{\text{Mn}^{2+}} 2\ \text{CO}_2 + 2\ \text{NO}_2 + 2\ \text{H}_2\text{O}$$

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 11.2 Aqueous Polishing Process and Chemistry

11.2-10. Section 11.2.1.2.12 , page 11.2-9 : First bullet, distillates from the oxalic mother liquors unit are fed to the acid recovery unit by batch, not continuously as noted in the DSER.

Fifth bullet: Replace "continuously" with "in batches."

Sixth bullet: Add "continuously" to the end of the bullet.

Note that the bulleted list in the DSER is not consistent with revised CAR 11.3.2.12.1.

11.2-11. Section 11.2.1.2.14 , page 11.2-9 : DCS recommends the following changes to the 1st sentence: "The Offgas Treatment Unit ventilation system is dedicated to maintaining a system negative pressure for AP process confinement and for removal of vapors and gases from processing equipment. "

11.2-12. Section 11.2.1.2.14 , page 11.2-9 : First bullet, as noted in the CAR (Section 11.3.2.13.1), this unit provides for offgas removal from all the AP liquid units.

11.2-13. Section 11.2.1.3.10 , page 11.2-21 : First paragraph, first sentence, replace dodecane with tri-butyl phosphate (TBP).

11.2-14. Section 11.2.1.2.15 , page 11.2-10 : First dash, last sentence is inaccurate, the low level liquid waste stream is not in a double-walled pipe. Only the stripped uranium and high alpha waste streams are in double-walled pipes.

11.2-15. Section 11.2.1.3.1 , page 11.2-12 : The DSER states "...if a high chloride-containing stream is directed to the dissolution electrolyzer by mistake, an event involving a hazardous chemical release (chlorine gas) from radioactive material could result. Thus, up to 3-5 kilograms of chlorine could be evolved which could have an intermediate consequence on the site worker." DCS notes that this issue is closed in the Open Item status report issued 28 May 2003.

11.2-16. Section 11.2.1.3.6 , page 11.2-17 & 18 : DSER states "The applicant has not proposed a control strategy, or any PSSCs and design bases, for hazardous chemical releases from the potential loss of confinement of radioactive materials in this unit (i.e., the loss of confinement would allow an untreated flow path (bypassing the Offgas Treatment System) for chemical releases from the nitric acid solutions, nitrate/oxalate mixture, and calciner gases)."

For the nitric acid release from the KCA unit which would bypass the Offgas Treatment System (e.g., a release from KCA TK 1000 or TK 2000), such a release would occur in a process cell. CAR Sections 5.5.2.1.6.4, 5.5.2.10, and 8.4.1 describe consequence analyses performed that demonstrate leaks of radiological and chemical material within process cells do not exceed the performance requirements of 10 CFR 70.61. Unmitigated consequences of a chemical leak in a process cell are low to the site worker and the public. With regard to indoor releases of nitric acid at elevated temperature (a maximum

of 60 C in the KCA unit) such releases have been evaluated (up to 500 liters of 13.6 N HNO3 and 120 C in the KPC unit) and do not exceed the performance requirements of 10 CFR 70.61. For a nitrate/oxalate mixture release from the KCA unit which would bypass the Offgas Treatment System (e.g., releases from PREC 5000, PREC 6000, and FLT 7000), such a release would occur in a glovebox which protects the facility worker. Chemical releases from equipment inside gloveboxes are bounded by releases from large tanks in process cells. For a calciner gas release from the KCA unit (i.e., CO2, O2, N2, and H2O), such a release would occur in glovebox, a process cell, or inside a double walled pipe inside a C3 accessible area. Releases of these gases to outside receptors are also bounded by releases from tanks in process cells.

11.2-17. Section 11.2.1.3.6 , page 11.2-18 : The staff implies that a safety function be ascribed to the nitrogen system as a result of it providing protection to the bearings of the calciner from an oxygen-rich environment. The staff states that the calciner is likely to include components, such as bearings and seals that have requirements to maintain their integrity. These components may be adversely affected and lose confinement integrity if operated at above ambient temperatures in the presence of air or oxygen. The applicant has identified nitrogen cooling of the calciner bearings as a means to protect them, presumably from the oxygen-rich environment, but has not identified this as a safety function. {The issue of whether the nitrogen system is a PSSC because of its bearing cooling function has been discussed in Revised DSER Section 11.9.} As DCS has 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. Nitrogen cooling is provided to extend bearing life. Additionally, there are no open items identified in DSER 11.9. DCS believes this issue has been previously resolved and is closed.

11.2-18. Section 11.2.1.3.6 , page 11.2-18 : The DSER states "The applicant has not identified a design basis for the plutonium dioxide powder produced by oxalic acid precipitation and oxidation. The staff is concerned that, without controls, the oxide powder may be sub-stoichiometric or have entrained or absorbed solutions subject to radiolysis, and, thus, be pyrophoric and present a hazard."

As stated in Section 11.3.1.2.3, page 11.3-12 of the RDSER, the applicant has indicated that over-pressurization from the oxidation of plutonium (III) oxalate contained within the stored cans may be prevented through one of the following:

1. Controls on plutonium oxalate furnace (calciner) parameters, such as residence time and minimum temperature to ensure complete oxidation and moisture content of plutonium oxalate entering the furnace.

2. Experimental confirmation of the minimum water content accompanying plutonium (III) at the exit of the furnace to prevent any over-pressurization due to the energy liberated during re-oxidation (to plutonium (IV)).

3. Measurement of the plutonium (III) content in the plutonium dioxide powder.

The specific IROFS will be identified as part of the ISA. DCS understood that the staff found this acceptable for the construction permit stage.

11.2-19. Section 11.2.1.3.6 , page 11.2-18 : Last two paragraphs. It is not clear whether the staff finds this acceptable; no open item was identified and no conclusion is apparent.

11.2-20. Section 11.2.1.3.9 , page 11.2-19 : DSER states that DCS did not identify a red oil hazard for the following units: Oxalic Precipitation and Oxidation Unit (KCA) and Oxalic Mother Liquor Recovery Unit (KCD). These statements are not accurate. Table 5A-2 of the revised CAR identifies Event Number AP-39 as a "chemical explosion involving red oil formation" applicable to the following specific locations: Precipitation-Filtration-Oxidation (KCA) and Oxalic mother liquors recovery (KCD).

11.2-21. Section 11.2.1.3.10 , page 11.2-20 : Last bullet under first paragraph: "HEPA filtration of off gases from the calcination furnace (prior to stack release)." The off gases from the calcination furnace do not go through the KWG off gas system but go through the VHD system utilizing the HVAC system final filters before venting to atmosphere. Bullet should be deleted.

11.2-22. Section 11.2.1.3.12 , page 11.2-22 : Second paragraph in section indicates that "... the alkaline waste stream will be acidified in a separate neutralization tank prior to being mixed with the diluted uranium nitrate in the high alpha waste tanks." The diluted uranium nitrate waste stream is not mixed with the high alpha waste tanks nor the alkaline waste stream. Thus, diluted uranium nitrate should be removed from the above sentence.

11.2-23. Section 11.2.1.3.12 , page 11.2-22 : The second sentence of Paragraph 3 should be modified to read: "These are double walled stainless steel pipes seismically qualified and designed with leak detection and collection."

11.2-24. Section 11.2.1.3.12 , page 11.2-22 : The fifth sentence of Paragraph 2 should be modified to read: "Since the solubility limits of azides in alkaline media are lower, the alkaline media is acidified to increase the solubility limits."

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 11.3 Mixed Oxide Process System Description and Review

11.3-1. Section 11.3.1.2.4 , page 11.3-13 : Second paragraph. DSER states "The applicant further states that a cooling water leak will be demonstrated to be highly unlikely, specific items relied on for safety features will be identified for the humidifying loop, and relief valves will render steam pressurization of the cooling water loop to be highly unlikely." Should be revised to reflect that it would be highly unlikely for a cooling water leak to lead to a sintering furnace loss of confinement.

11.3-2. Section 11.3.1.2.4 , page 11.3-14 : The third paragraph, last sentence states: "In addition, hydrogen sensors in the airlocks and oxygen sensors in the furnace would detect their respective gases and terminate the hydrogen flow; all of these would be PSSCs." There are no hydrogen sensors in the furnace airlocks. Hydrogen is expected to be present in the airlocks under normal conditions when the airlocks are cycled open and closed.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 11.4 Ventilation and Confinement Systems

11.4-1. Section 11.4.1.1.1 , page 11.4-2 : In the first bulleted item on the page, the term "two-stage spark arrester" no longer applies. DCS is currently using a stainless steel roughing filter and stainless steel/glass fiber pre filter in place of the spark arresters. These two components are designed to remove hot embers and a large percentage of the soot in order to protect the final HEPA filters from fire damage and excessive plugging. This comment applies through out this document.

11.4-2. Section 11.4.1.1.1 , page 11.4-2 : 5th bullet states that the "The applicant proposed to use a release factor of 1E-04 for the final filter assemblies in its accident safety analyses (revised CAR Sections 5.5.3.2 and 11.4.9). The applicant based its proposal on having redundant HEPA filter banks in each redundant filter assembly with HEPA filters that have been tested to have an efficiency for removal of 0.3 micron particles of at least 99.97 percent." The second statement should be clarified to add the phrase "both two-stage stainless steel roughing and prefilter assemblies to mitigate severe conditions before they reached the redundant HEPA filter banks and" between the phrases "proposal on having" and "redundant HEPA". The two-stage stainless steel roughing filter and stainless steel/glass fiber prefilter assemblies built into the redundant HEPA filter bank design ensure that the redundant HEPA filter banks are not exposed to the severe environmental conditions that have damaged HEPA filters in the past. The stainless steel roughing and prefilter assemblies are completely noncombustible, structurally strong filter units designed to collect greater than 90% of the soot generated by the design basis fire at the design flow rate and to withstand the full differential pressure generated by the fans when completely clogged. The "two-stage roughing and prefilter assemblies" are new PSSC that replace the "two-stage spark arrestors" proposed in the original design. (See comment to Section 11.4.1.3, page 11.4-13, last paragraph.)

11.4-3. Section 11.4 , page Table 11.4-1 : C2 Confinement System, Controlling Parameters - revise: "System design in accordance with Regulatory Guide 3.12" to include: "except heat removal is by airflow dilution" to be consistent with C3.

11.4-4. Section 11.4 , page Table 11.4-1 : Process Cell Exhaust, Controlling Parameters - replace: "Two 100 percent capacity filtration stages (using electric heaters and two HEPA filter stages)" with "Two 100 percent capacity filtration units with two HEPA filter banks prior to discharge".

11.4-5. Section 11.4 , page Table 11.4-1 : Process Cell Exhaust, Controlling Parameters - revise: "System design in accordance with Regulatory Guide 3.12" to include: "except heat removal is by airflow dilution" to be consistent with C3.

11.4-6. Section 11.4 , page Table 11.4-1 : Emergency Control Room, Controlling Parameters - consider re-writing the first item as follows: "Redundant HVAC systems (trains A & B) each with an outside air intake with continuous monitoring for hazardous chemicals."

11.4-7. Section 11.4 , page Table 11.4-1 : Supply Air System, Controlling Parameters - delete: "HEPA filter design; and isolation dampers in accordance with ASME N509" and

"HEPA filter design and testing; ductwork and pipe flexible connections; and fan design, construction, and testing in accordance with ASME AG-1";

11.4-8. Section 11.4 , page Table 11.4-1 : Off Gas Treatment System, Controlling Parameters - This section is written like the other HVAC systems. It is not an HVAC system, it is a process vent system. The system is comprised of two separate trains, each with two sets of 100% capacity, two stage HEPA filter units with coolers and electric reheating coils on the filter inlets to reduce moisture carryover into the filters. The filters should have provisions for aerosol testing and be designed and tested in accordance with ASME N509 and N510. There are two sets of two 100% capacity exhaust fans, one set per train. Regulatory Guide 3.12, ASME AG-1 and ERDA 76-21 do not apply. All piping and valves will be in accordance with ASME B31.3.

11.4-9. Section 11.4 , page Table 11.4-1 : C4 Confinement System, Controlling Parameters - Revise two-stage spark arresters as described above.

11.4-10. Section 11.4 , page Table 11.4-1 : C3 Confinement System, Controlling Parameters - Revise two-stage spark arresters as described above.

11.4-11. Section 11.4 , page Table 11.4-1 : C2 Confinement System, Controlling Parameters - Revise two-stage spark arresters as described above.

11.4-12. Section 11.4 , page Table 11.4-1 : Process Cell Exhaust, Controlling Parameters - Revise two-stage spark arresters as described above

11.4-13. Section 11.4 , page Table 11.4-1 : Emergency Control Room, Controlling Parameters, line 5 - change "exhaust" to "pressurization". Add: "Four (4) battery room exhaust fans (two per train) and two (2) electronics room/battery room air conditioning units.

11.4-14. Section 11.4.1.3 , page 11.4-13 : Last paragraph states that the "The applicant proposed to use a release factor of 1E-04 for the final filter assemblies in its accident safety analyses (revised CAR Sections 5.5.3.2 and 11.4.9). The applicant based its proposal on having redundant HEPA filter banks in each redundant filter assembly with HEPA filters that have been tested to have an efficiency for removal of 0.3 micron particles of at least 99.97 percent." The second statement should be clarified to add the phrase "both two-stage stainless steel roughing filter and stainless steel/glass fiber prefilter assemblies to mitigate severe conditions before they reached the redundant HEPA filter banks and" between the phrases "proposal on having" and "redundant HEPA". The two-stage stainless steel roughing and prefilter assemblies built into the redundant HEPA filter bank design ensure that the redundant HEPA filter banks are not exposed to the severe environmental conditions that have damaged HEPA filters in the past. The stainless steel roughing and prefilter assemblies are completely noncombustible, structurally strong filter units designed to collect greater than 90% of the soot generated by the design basis fire at the design flow rate and to withstand the full differential pressure generated by the fans when completely clogged. The "two-stage

roughing and prefilter assemblies" are new PSSC that replace the "two-stage spark arrestors" proposed in the original design. (See comment to Section 11.4.1.1.1, page 11.4-2, 5th bullet.)

11.4-15. Section 11.4.1.3 , page 11.4-14 : Second paragraph states "Using the Ballinger correlation (see Reference 11.4.3.8), the applicant computed a maximum HEPA filter loading of 4.08 kg/filter at a differential pressure of 10.5 in. water gauge (WG). The largest fire loading was computed to be 3.5 kg/filter. Using the Ballinger correlation, the staff computed a maximum HEPA filter loading of 1.2 kg/filter for the proposed 1500 cubic feet per minute (CFM) sized HEPA filter at a 10 in. WG differential pressure (a differential pressure of 10 in. WG is the highest recommended loading for nuclear-grade HEPA filters)." In the revised CAR, DCS revised the HEPA filter design to redistribute the soot generated during a fire such that the soot is collected on the upstream two-stage stainless steel roughing filter and stainless steel/glass fiber prefilter assemblies instead of on the redundant HEPA filter banks. This redesign results in a very low soot load (between 1 and 10% or 35 to 350 grams) on the redundant HEPA filter banks. The current maximum soot load is much lower than any of the calculated capacities of the HEPA filters to account for uncertainties in the calculations. The lower soot load ensures that the HEPA filter banks are not exposed to severe differential pressure conditions as a result of a fire. To address the uncertainties in the calculations, DCS further committed to conduct a series of experiments to determine the specific soot load values applicable for the type of soot anticipated to be generated as a result of the combustible materials present in the facility and to adjust the number of filters required to maintain low soot loads.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 11.5 Electrical Systems

11.5-1. Section 11.5.1.1.2.2 , page 11.5-3 : Delete reference to 125 vdc batteries. This was deleted from the CAR to allow flexibility with the voltage rating when purchasing a vendor packaged system.

11.5-2. Section 11.5.1.1.2.2 , page 11.5-3 : Note that the revised CAR states "...storage of eight hours, up to 660 gallons..."

11.5-3. Section 11.5.1.1.2.3.1 , page 11.5-4 : Top of page. Note that the CAR states: "...storage of eight hours, up to 660 gallons..."

11.5-4. Section 11.5.1.1.2.3.1 , page 11.5-4 : First line on page. Add "... loss of normal and standby power or degraded voltage to its associated..."

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 11.6 Instrumentation and Control Systems

11.6-1. Section 11.6.1.1.2.1 , page 11.6-2 : Regarding the statement "Any channel in the safety control subsystem in the AP or MP process control system may be designated a PSSC as a result of the applicant's facility safety analysis." This is true, but could be misleading. If there is a safety channel, it will be a PSSC. Thus, all safety channels are a PSSC. If there is no need for a safety channel, it won't be there.

11.6-2. Section 11.6.1.1.2.2 , page 11.6-2 : In this paragraph, where "safety control"is used, it should be changed to "auxiliary control" (4 places).

11.6-3. Section 11.6.1.1.2.2 , page 11.6-2 : DCS recommends the following change to the 2nd sentence: "Specifically, the normal control subsystem controls operation of the support systems, the protective control subsystem protects personnel and equipment, and the auxiliary control subsystem is a backup to the normal utility controls systems and prevents challenges to the emergency control system."

11.6-4. Section 11.6.1.1.2.5 , page 11.6-4 : DCS recommends the following change to the last paragraph, last sentence: "These controls have priority over the normal, auxiliary, and protective controls."

11.6-5. Section 11.6.1.1.2.7 , page 11.6-4 : In the 2nd sentence, the words "the personnel and equipment protection (PEP) controllers, the safety controllers" should be deleted.

11.6-6. Section 11.6.1.1.2.7 , page 11.6-4 : In the 3rd sentence under Protective Controllers, the PLCs may be located near, not only in, the MCCs.

11.6-7. Section 11.6.1.1.2.7 , page 11.6-5 : Under Safety Controllers the 2nd sentence ("Safety controllers perform ..." should be deleted.

11.6-8. Section 11.6.1.1.2.7 , page 11.6-5 : The last paragraph under Safety Controllers should be labeled "Auxiliary Controllers" and the term safety controller" should be replaced with "auxiliary controller" (2 places). Also, the control room is the AP control room, not the "auxiliary utilities control room.

11.6-9. Section 11.6.1.1.2.7 , page 11.6-5 : Under Emergency Controllers, they may be solid state controllers or traditional logic relay circuits.

11.6-10. Section 11.6.1.1.2.9 , page 11.6-5 : Delete "realtime ".

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 11.8 Fluid Transport Systems

11.8-1. Section 11.8.1.1 , page 11.8-4 : As stated in the revised CAR (11.8.3.2), the 3rd sentence of the last paragraph should be revised as follows: "~~American Society for Testing and design of equipment to these standards means that the components are designed for the most Materials (ASTM) materials are also used for the fabrication of other components~~.ASTM materials are used for other components." The current sentence appears to be a fragmented sentence.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 11.9 Fluid Systems (Bulk Materials, Reagents, and Gases)

11.9-1. Section 11.9.1.1 , page 11.9-4 : DCS recommends adding the zirconium nitrate system and aluminum nitrate system to the Reagent Systems.

11.9-2. Section 11.9.1.1 , page 11.9-4 : DCS recommends that the 2nd sentence in the 2nd paragraph under Reagent Systems be changed as follows: "The acid is stored in tote tanks in the reagent processing building."

11.9-3. Section 11.9.1.1 , page 11.9-4 : DCS recommends that the 2nd sentence in the 3rd paragraph under Reagent Systems be changed as follows: "Silver nitrate, demineralized water, and 13.6N nitric acid are mixed in a preparation tank in the Reagent processing building and pumped to a distribution tank in the AP area."

11.9-4. Section 11.9.1.2 , page 11.9-8 : Top of page end of sentence fragment and fourth paragraph under heading "Evaluation of Seismic Isolation Valves." Delete "and the emergency control room." Valve position indicators are not in the emergency control room.

11.9-5. Section 11.9.1.2 , page 11.9-8 : The 2nd paragraph of the "Evaluation of Seismic Isolation Valves" section states that "*all* piping penetrations in the facility process building walls that could pose a fire, explosion, confinement, or flooding risk, or that could lead radioactive materials into the environment will be isolated by redundant, automatic, seismically qualified isolation valves." From this discussion, one could infer that even firewater lines have seismic isolation valves, which is not correct. Firewater lines do not have seismic isolation valves in order to ensure firewater remains available after a seismic event. Therefore, the word "all" needs to be removed from the beginning of this statement.

11.9-6. Section 11.9.1.2 , page 11.9-9 : First paragraph. Change sentence to read "...in the event of a failure of the valve actuator, or the air supply, or on loss of power."

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 12 Human Factors Engineering

12-1. Section 12.1.1 , page 12.0-2 : Second paragraph. The DSER states: "... given that industrial safety requirements are important, considered and evaluated the potential for personnel errors of commission that might result in overriding or defeating safety systems," is very confusing. The industrial safety controls are not related to the nuclear safety controls. The protective control system can not prevent the defeat or override of a safety control.

12-2. Section 12.1.1 , page 12.0-2 : First paragraph. The DSER states: "The applicant also committed to using the Design Review Checklist in NUREG/CR-6636 ..." In DCS' 7 January 2002 letter to the NRC it was stated that "...DCS will review these criteria for applicability to the digital controls of the principle SSCs..." Enclosure A, page 21 .

12-3. Section 12.1.1 , page 12.0-2 : First paragraph. The DSER states "all of the NUREG/CR references in Chapter 12.0 of NUREG-1718 would be used as guidance ..." In DCS' 7 January 2002 letter it was stated that the NUREGs would be reviewed for applicability to the MFFF. NUREG 6636 is not applicable to the MFFF because it has to do with modifications and upgrades to existing facilities. The noted NUREGS were written for the specific purpose of guiding the development of NUREG 0700 Revision 2, not designing a new facility. Revision 2 of NUREG 0700 has been issued and it contains the appropriate information previously contained in the noted NUREGs.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Chapter 14 Emergency Management

14-1. Section 14.1 , page 14.0-1 : With respect to the BDC discussion in the second bullet, the following paragraph on this page of the DSER and the earlier comment (number 11.0-1), the reference to a presentation on 4 January 2001 between NRC staff and DCS is unnecessary. The DCS commitment regarding emergency management is as stated in Chapter 14 of the CAR. The 4 January 2001 meeting was informative.

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Editorial Comments

E-1. Section Acronyms , page x : EFT" should read "ETF" in the Acronyms section of the DSER.

E-2. Section 1.3.1.5.1 , page 1.3-8 : End of first paragraph. The reference for Lee, et al 1997 is not provided in this format in the References section.. This is likely Lee, Maryak and McHood, SRS Seismic Response Analysis and Design Basis Guidelines, SRS/Westinghouse, WSRC-TR-97-0085 which is shown in the References section as 1.3.3.36.

E-3. Section 1.3.1.5.1 , page 1.3-9 : Last sentence on page states "basis geologic and seismic characteristics ..." This should be "basic geologic and seismic characteristics ...".

E-4. Section 1.3.1.6.1 , page 1.3-16 : Fifth paragraph. The second sentence cites "two facility site geotechnical reports (Reference 1.3.3.14)". It appears that this should be References 1.3.3.14 & 15; i.e., Revisions C & A of the MFFF Geotechnical Report.

E-5. Section 1.3.3, References 1.3.3.14 and 1.3.3.15, page 1.3-20 : These References in the DSER are identified as the MFFF Geotechnical Report as NTE-G-0005-C & A. The correct number is NTE-G-00005-C and A, respectively. This same comment applies to Reference 11.1.3.11.

E-6. Section 5.0 Table 5-2 , page : Under the table entry "Principal SSCs and Design Bases Functions and Values Developed from the Safety Assessment" under the PSSC "Criticality controls (continued)." Delete "(continued)".

E-7. Section 5.0 Table 5-2 , page 5.0-78 : Replace "atmoshere" with "atmosphere."

E-8. Section 8.1.2.5.3.2 , page 8-28 : In the paragraph beginning "Energetic decomposition ..." There is a typographical error. Change: "... with hyrazoic acid:" to : "... with hydrazoic acid:"

E-9. Section 9.1.1.3 , page 9.0-4 : Second paragraph. There is a partial last sentence at the end of the paragraph that begins "Given a MFFF design". This sentence is a fragment that should be deleted. The sentence is actually contained in entirety below Table 9.1-1.

E-10. Section 9.1.1.3 , page Entire section : The term "plutonium applicant" and "uranium applicant" is used throughout this section. It appears that these terms have been inadvertently used to replace "plutonium oxide" and "uranium oxide" within this chapter of the DSER.

E-11. Section 11.1.1.3.1 , page 11.1-3 : The reference in the second paragraph to ACI 349.1R should be ACI 349-97.

E-12. Section 11.2.1.1 , page 11.2-2 : Item Number 1. Change to "...Dissolution is complete ~~and rapid~~, with the rate determined by the generation of the silver(II) ions, at relatively mild temperatures (68°-104° F [20°-40° C] nominal temperature 86°F (30°C)).

Dechlorination is required prior to dissolution for those powders containing chlorides (for AFS feedstock).

E-13. Section 11.2.1.2.11 , page 11.2-8 : Changes to be consistent with revised CAR.

3rd Bullet: Replace the phase "purify the overhead product" with "remove plutonium from the distillates."
4th Bullet: Replace the word "overhead" with "distillates."
5th Bullet: Replace the phrase "at a controlled rate" with "by batch."

E-14. Section 11.2.1.3.12 , page 11.2-23 : First paragraph, what is the meaning of the asterisk "*" at the end of the paragraph? There are no footnotes, so the asterisk should be deleted.

E-15. Section 11.2.1.3.12 , page 11.2-23 : Third paragraph, delete the first "provide" in the 4th sentence.

E-16. Section 11.2.1.3.13 , page 11.2-24 : First paragraph, correct spelling of handling in the 3rd sentence and delete stray "to" in 4th sentence.

E-17. Section 11.4 , page Table 11.4-1 : C4 Confinement System, System Function - Consider changing: "Maintain negative glove box pressure in small breaches" to Maintain confinement air flow after small breaches".

E-18. Section 11.4 , page Table 11.4-1 : C3 Confinement System, System Function - Consider changing: "Provide cooling air to electrical rooms" to: "Provide cooling air to electrical rooms that support the C4 and C3 exhaust system fans."

E-19. Section 11.5.1.1.1 , page 11.5-2 : Add "system," after exhaust.

E-20. Section 11.5.1.1.2.1 , page 11.5-2 : Fourth paragraph. Add "with" after "...failure along with ..."

E-21. Section 11.5.1.1.2.3.2 , page 11.5-4 : Last sentence. Change to "...charger failure along with battery voltage..."

E-22. Section 11.5.1.1.2.4 , page 11.5-5 : Third paragraph, first bullet. Typographical error – Savannah.

E-23. Section 11.9.1.1 , page 11.9-3 : DSER states: "The plant water system consists of a supply header the supplies industrial-grade water from SRS to utility, MOX Processing (MP), and AP users." Correct typographical error in sentence as follows: "The plant water system consists of a supply header that supplies industrial-grade water from SRS to utility, MOX Processing (MP), and AP users."

Enclosure 1
DCS Comments on NRC Revised Draft Safety Evaluation Report
Editorial Comments

E-24. Section 11.9.1.1 , page 11.9-7 : DSER states: "The gas is will be found in the gas storage area and the laboratory." Correct typographical error as follows: "The gas is found in the gas storage area and the laboratory."

E-25. Section 11.9.1.2 , page 11.9-10 : In the 4th sentence of the "Design Basis of the Emergency Diesel Generator Fuel Oil System", revise the start of the sentence as follows: "Each EDG fuel oil system has a ..."

E-26. Section 12.2 , page 12.0-6 : Last line on page. It appears that "processed" should be "processes."

E-27. Section 15.6 , page 15.0-24 : In Section 15.6 Audits and Assessments, the first sentence in the first full paragraph on the page appears to be either incomplete or overly complete. As written it states "*Audits and assessments of SSCs commensurate will be scheduled to provide coverage, consistency and coordination with ongoing work and at a frequency commensurate with the project status and importance of the work.*" DCS recommends deletion of the first occurrence of the word commensurate identified by underline.

E-28. Section 15.7.2.1 , page 15.0-27 : Section 15.7.2.1 appears to be numbered incorrectly. Since it precedes Section 15.7.2, it should probably be 15.7.1.1.