October 30, 2002

Mr. Peter Hastings, Licensing Manager
Duke Cogema Stone & Webster
P.O. Box 31847
Mail Code: FC-12A
Charlotte, NC 28231-187

SUBJECT: RESPONSE TO DCS LETTER DATED JULY 9, 2002 (DCS-NRC-0001000)

Dear Mr. Hastings:

NRC staff has reviewed the information provided in DCS' July 9, 2002, letter in which DCS provided the results of its review of NRC's draft Safety Evaluation Report (DSER) dated April 30, 2002. The staff's review of DCS' response is described in the enclosure.

In most cases, NRC staff agreed with DCS' comments and will revise the DSER accordingly when a revised DSER is published in April 2003, however, NRC staff disagreed with some of DCS' comments for reasons stated in the enclosure. Additionally, there are some instances where NRC staff requests that DCS clarify its comment since it appears that the comment conflicts with information previously provided by DCS.

The staff has described the open items in its DSER, in a letter to DCS dated June 27, 2002, and in the enclosure to this letter. If further clarification is necessary, the staff would welcome a meeting, open to the public in accordance with NRC policy, with DCS staff to provide any needed clarifications.

On a related matter, in DCS' letter dated August 23, 2002, DCS provided a schedule for submitting additional information to NRC regarding open items in the staff's DSER. The staff notes that there are a number of open items for which DCS intends to submit additional information in January 2003.

Based on the January 2003 submittal dates, the NRC staff may not be able to complete its review of the additional information by April 2003, the date when the staff plans to issue a revised DSER. In order for the staff to be able to review the additional information by April 2003, DCS should submit the information earlier than January 2003.

Sincerely,

/RA/

Andrew Persinko, Project Manager
Special Projects Section
Special Projects and Inspection Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket: 70-3098

Enclosure: Response to DCS Letter Dated July 9, 2002

cc: Mr. James Johnson, DOE
Mr. Henry Porter, SC Dept. of H&EC
Mr. John T. Conway, DNFSB
Mr. Louis Zeller, BREDL
Ms. Glenn, Carroll, GANE

October 30, 2002

Based on the January 2003 submittal dates, the NRC staff may not be able to complete its review of the additional information by April 2003, the date when the staff plans to issue a revised DSER. In order for the staff to be able to review the additional information by April 2003, DCS should submit the information earlier than January 2003.

Sincerely,

/RA/

Andrew Persinko, Project Manager
Special Projects Section
Special Projects and Inspection Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket: 70-3098

Enclosure: Response to DCS Letter Dated July 9, 2002

cc: Mr. James Johnson, DOE
Mr. Henry Porter, SC Dept. of H&EC
Mr. John T. Conway, DNFSB
Mr. Louis Zeller, BREDL
Ms. Glenn, Carroll, GANE

DISTRIBUTION: ADAMS PUBLIC FCSS r/f SPB r/f DAyres, RII WGleaves
JHull,OGC TJohnson, SSteele, RWescott AMurray Hearing File
RHannah,RII PHiland,RIII DBrown TPowell WSmith HFelsher
MChatterton FBurrows JCalvert THarris JKramer WTroskoski
ML023030544
G:\SPB\AXP1\resptoDCSLtr 7-9-02.WPD *SEE PREVIOUS CONCURRENCE

OFC	SPIB*	E	SPIB*	E	SPIB*	E	SPIB*	E
NAME	APersinko:dw		KValloch		JGiitter		MLeach	
DATE	10 / 29 /02		10/ 28 /02		10/ 29 /02		10/ 30 /02	

C = COVER E = COVER OFFICIAL RECORD COPY

Response to DCS Letter Dated July 9, 2002

Section 1.3, Site Description

1.3-1	Disagree.	Population information should be updated using 2000 data and included in the license application.
1.3-2	Disagree.	The high alpha concentration could have worker risk. DCS should modify this section to acknowledge contamination under proposed site and provide rationale why health risk is acceptable.

Chapter 2, Financial Qualifications

2-1	Agree in part.	Design costs should be provided in same level of detail as construction costs. Design cost is currently presented as a single line item.

Chapter 5, Safety Assessment of the Design Basis

5-1	Agree.	Will revise DSER.
5-2	Agree in part.	Some amount of quantification is still required that is applicable to site workers and the public. For example, in response to NRC question 39 in the Request for Additional Information, DCS stated that it will provide a supplemental likelihood assessment for events that could exceed the threshold criteria for the site worker and the public. The likelihood assessment will demonstrate a target likelihood index comparable to a score of -5 as defined in Appendix A of the SRP.
5-3	Agree.	Will revise DSER.
5-4	Agree.	Will revise DSER.
5-5	Agree.	Will revise DSER.
5-6	Agree.	Will revise DSER.

5-7 Table 5-1 Comments:

- Agree. Will revise DSER.
- Agree. Will revise DSER.
- Agree. Will revise DSER. The applicant stated that it has no plans to use software programmable electronic systems in the emergency control system. If in the future, the design changes to include

software programmable electronic systems in the emergency control systems, then these regulatory guides and standards that are being removed would apply.

- Agree. Will revise DSER.
- Agree. Will revise DSER.
- Clarification needed. It appears that there is a discrepancy between CAR Tables 5.6-1 and 5.5-10 with respect to one of the safety functions of the Process Safety I&C PSSC, which is to isolate pressurization supplies. DCS should clarify the role of PSSCs in preventing the over/under pressurization of the glovebox (loss of confinement event) and revise the CAR or the DCS response as appropriate.
- Agree . Will revise DSER.
- Agree. Will revise DSER.

5-8 Section 5.4.1.3:

- Disagree (high temperature non-fire glovebox failure related event): The PSSCs listed in CAR 5.5.2.1.6.1 and 5.5.2.1.6.9 are specific to the accidents where the failure of the glovebox (or immediate containment) is postulated; the process safety I&C system and C3 confinement, and HDES for 3013 canister storage structure, respectively, are identified as PSSCs for these events. The staff agrees that for scenarios where the C3 confinement system is designated as a PSSC for protection of possible receptors, the design basis of the glovebox windows is not a part of the safety strategy. To clarify, these scenarios (CAR 5.5.2.1.6.1 and 5.5.2.1.6.9) are not related to the staff's postulated event and related questions.

  The postulated accident scenario of a high-temperature non-fire-related failure of a glovebox is more closely related to an event such as given in CAR 5.5.2.1.6.3, for small breaches in a glovebox confinement boundary. The event is not a fire, nor is it a result of a process upset; it is most aptly represented by the overheating of a window panel by an external heat source, such as a lighting fixture, motor, or electrical panel. In this case, the heating could change the material properties of the window and/or seals in such a way as to challenge the assumption of the maximum design basis for airflow velocity across a C4 opening. The staff believes that a postulated high temperature non-fire related failure of a MFFF glovebox window due to creep or material deformation may violate the C4 design basis 125 ft/min face velocity across two 8-inch glove ports or one bag-out port up to 24 inches in diameter. This is because cases of high

temperature creep or plastic deformation in glovebox windows may result in changes in material properties of the polycarbonate windows such that the windows may no longer meet their design bases. In these cases, it would be conservative to assume the failure of the entire area of the window, thereby possibly exceeding the C4 design bases. Based on knowledge of similar window construction at similar facilities, the staff believes that many glovebox windows at the proposed MFFF may exceed ~3.2 square feet in area and therefore may pose an unacceptable challenge to the C4 ventilation system if the appropriate design bases are not applied. (For the GB-4 event, the C4 active ventilation system protects the facility worker. No PSSCs are required for the site worker or public. The C3 system provides defense in depth for the site worker and public.)

Additionally, in August, 2001, DCS stated, "for the hypothetical condition, the temperature of the upper lateral polycarbonate panel in the handling and storage tunnel exceeds the thermal design criteria by approximately 10°F. However, more detailed calculations are expected to show that material limits are not exceeded. If necessary, cooling will be provided. This information will be provided in the ISA." With regard to this statement, the staff has the following concerns: 1) that there may be other local conditions throughout the MFFF, such as heat transferred from glovebox lighting units, hydraulic systems, and electrical equipment that may similarly challenge the glovebox window thermal design criteria, if so, DCS should provide this information, or steps that will be taken to ensure the validity of the environmental temperature assumption, 2) that DCS has yet to provide design basis information on the polycarbonate materials to be used (see previous NRC communications), and 3) if cooling is needed for specific applications, DCS has not supplied information on the cooling system design basis and possible designation of additional PSSCs.

During a phone call on September 17, 2002, DCS stated that it will show that its preventive strategy bounds events such as the loss of a entire window. It will consider long term effects of heating and heat cycling which can lead to the loss of the windows or the glovebox itself.

- Disagree (buildup of flammable gases): The applicant has not addressed AP-2 of the NRC letter of 6/27/2002 . Event AP-7 mentions explosions but does not consider hydrogen or other flammable gases generated by electrolysis. No PSSC and/or design bases are identified for addressing flammable gas accumulation from electrolysis and the scavenging air flow is based upon radiolytic gas generation only (see RAI Response 122). Hydrogen gas generation from electrolysis is greater than that generated by radiolysis. DCS needs to present a strategy to prevent or mitigate

the potential uncontrolled generation of flammable gases in the electrolyzer which may result in fires or explosions. The strategy needs to address all flammable gases and not just radiolytically generated hydrogen. In a phone call on September 17, 2002, DCS stated that it would provide information that (1) establishes a hydrogen and flammable gas limit (perhaps 25% of LFL); and (2) identifies chemical safety controls as the PSSC to control acid normality and hydrogen generation.

- Disagree. (hydrogen explosion outside of airlocks): This postulated event does not appear to be described by event PT-4 because the event would take place within the MFFF gloveboxes connected and adjacent to the sintering furnace airlocks. DCS has not shown that the safety strategy for an explosion within the sintering furnace or the sintering furnace room applies to an explosion in MFFF gloveboxes adjacent to the sintering furnace. Hydrogen accumulation in adjacent gloveboxes could occur due to a leak in the non-PSSC airlock seals, airlock, or a failure of the non-PSSC nitrogen system purge gasses. Such an event may not be prevented by interlocks that are controlled by the PSSC process I&C system. This concern follows the staff's assumption that, even though the sintering furnace and airlocks and associate hardware have a pressure design basis, they are not PSSCs and cannot be assumed to reduce the flow of hydrogen past the airlock or airlock seals, even when locked closed by the process I&C system. This concern also follows due to the fact that the nitrogen purging of the sintering furnace airlocks and the nitrogen atmosphere in the MFFF gloveboxes are not PSSCs and therefore cannot be relied upon to be present and available prior to an initiating event. Therefore, they cannot be assumed to reduce or eliminate the flow of hydrogen into the connected gloveboxes. This concern arises as a logical extension resulting from DCS' clarification that the nitrogen system is not a PSSC for the purposes of providing hydrogen purging in the sintering furnace airlocks.

  If hydrogen gas is able to pass the airlocks and enter other MFFF gloveboxes, the staff believes that an explosion in an AP/MP C3 glovebox area could exceed the intermediate consequence of concern to a facility worker. DCS has not shown this postulated event to be prevented. This open item is considered by NRC to be separate from other NRC open items on explosion scenarios and nitrogen cover gasses.

  NRC staff anticipates information from DCS on sensor placement (both inside and outside the sintering furnace, airlock, room, and any other sensor locations) and coverage, and DCS's review of industry standards (if applicable), and a clearer explanation of controls around the furnace and their design basis (December 18, 2001) DCS also stated in its letter dated April 23, 2002, that DCS

has completed an analysis, to be summarized in the CAR that demonstrates that the performance requirements of 10CFR70.61 are not exceeded.

- Disagree. (titanium fire) The applicant has not addressed item AP-3 of the NRC letter of 6/27/2002. As discussed in the draft SER, titanium in heat exchanger tubes and in packing has ignited in chemical process industry applications. In addition, each electrolyzer operates with several hundred amps of current and multiple tens of volts. This is more than enough to be an ignition source and is comparable to typical welding supplies. There are no PSSCs identified for electrical parameters on the electrolyzer.

  Titanium reactions and/or fires are not listed as examples in Event types GB-1 and AP-5 of the CAR. It does not appear that the PSSCs relied upon for events AP-5 and GB-1 (C-3 confinement system and a fire suppression system) will necessarily mitigate the effects of a titanium fire for the site worker and public due to the high temperatures involved (titanium burns at a higher temperature (over 2,000 C) than ordinary combustibles (less than 1,000 C is used in the CAR analyses); large "smoke" evolution and TiOx embers and their effects on the filters; and the rapidity of reactions and their effect on facility workers; all of these are likely to result in higher consequences. Finally, hot titanium may interact with other materials in the electrolyzer/glovebox area, including nitrates/nitric acid (mentioned in the titanium MSDS), water in the solutions (which would produce hydrogen), and plutonium dioxide.

  Further, suppression systems (e.g., CO2, inergen) may exacerbate the titanium fire condition due to chemical interactions. For example: (1) titanium combines readily with oxygen, nitrogen, and hydrogen at temperatures considerably below its melting point (3,140 F). In reference to the inadvertent use of water for titanium fire suppression or electrolyzer solution water contacting hot titanium, NFPA 481 states "the great affinity of high temperature titanium for oxygen will free a considerable amount of hydrogen, which can reach explosive concentrations in confined spaces." (2) the suppression system employed in glovebox areas is a clean agent (inergen). Inergen is composed of 52% nitrogen, 40% argon, and 8% CO2. As noted previously and in the fire protection literature, CO2 and nitrogen actually react with hot titanium. NFPA 2001 prohibits the use of clean agents on reactive metals, such as titanium, uranium, and plutonium, unless the clean agent has been tested to the satisfaction of the Authority Having Jurisdiction (AHJ).

  Documentation on the titanium fire open item was reviewed during an in-office review at the applicant's offices. The applicant intends to re-examine the titanium fire situation and include an

analysis and explanation in the revised CAR. The analysis and explanation should include soot loading effects on C3 filters and the ability of fire barriers to withstand titanium fires.

- Disagree. (nitrogen flow to calciner bearings): DCS stated that the nitrogen system is not a PSSC for the purposes of containment at the calciner bearing.

  The staff requires that DCS address a chemical release to a worker or public may occur as a result of a loss of containment in the calciner bearing and failure of the calciner glovebox. This postulated accident may allow a flow-path for chemicals from the AP system to bypass the offgas treatment system and enter the C3 & C4 systems that have no stated provisions for removing potentially hazardous chemicals (i.e., NOx, decomposing organics). Refer to page 11.2-9 of Section 11.2.1.2 of NRC's DSER for further discussion of the staff concern.

  In addition, without the benefit of the nitrogen cover gas, the oxygen atmosphere in the calciner may initiate reactions with the graphite bearing material, that may release high temperature and/or oxidizing particles of bearing materials, metals, and plutonium compounds. These materials may adversely impact the performance of the proposed mitigation strategy (C4 confinement). The staff requests DCS provide information that demonstrates that the postulated event is enveloped by other events, and describe those bounding events. Or DCS should provide information supporting its assertion that this is not a credible event. The staff also requests DCS submit any information related to design changes in the calciner, based on foreign experience, to be incorporated in the MFFF design, that relate to mitigating calciner confinement failure.

5-9 Agree. Will revise DSER.

Chapter 6, Nuclear Criticality Safety

6-1 Agree in part. The DSER should have stated, "As a result, USL-2 is normally significantly higher than USL-1, as it has ..." A determination that USL-2<USL-1 indicates insufficient administrative margin for USL-1. However, USL-2>USL-1 is necessary but not sufficient to demonstrate sufficient administrative margin. Will revise DSER.

6-2 Agree in part. The DSER refers to the comparison of the results between using the two USL methods rather than the values of the two USLs. For clarification purposes, the DSER should have stated, "Comparing the results of using the USL-2 method with using the USL-1 method, for EALF, H/Pu ratio, and ^{240}Pu content, the value of USL-2 was greater than the value of USL-1 and

		therefore the applicant determined that the use of 0.05 as the administrative margin was appropriate." However, USL-2>USL-1 is necessary but not sufficient to demonstrate sufficient administrative margin. Will revise DSER.
6-3	Agree in part.	Draft NUREG-1718 language rather than the final NUREG-1718 language was used in the DSER. Nevertheless, a minimum administrative margin of 0.05 is not acceptable without further justification, as has been discussed in recent conference calls. Will revise DSER.
6-4	Agree.	Will revise DSER.

Chapter 7, Fire Protection

7-1	Agree in part.	(Separation of electrical trains): Will partially revise DSER. Will not include "or enclosed raceway is used."
7-2	Agree.	(Entry of IROFS electrical trains): Will revise DSER
7-3	Under review.	(Backup power for detection/alarm system): DCS needs to confirm that the fire detection is not credited in any fire events. Staff continuing to review whether PSSC defense-in-depth systems should be supported by PSSC emergency power.
7-4	Disagree.	(Pressure cascade in airlocks): This wording reflects information in Section 7.2.5 of the CAR. DCS needs to revise the wording for clarification. NRC will revise DSER.
7-5	Agree in part.	(Independent ventilation for airlocks): DCS needs to clarify their wording in the CAR. NRC will revise DSER.
7-6	Agree in part.	(ignition sources in filter housings): DCS needs to revise this comment or clarify their response to RAI 146. DSER will be revised accordingly.
7-7	Under review.	(Reference to NFPA 20 and 22): Staff continuing to review.
7-8	Agree.	(portable CO2 bottles) Staff will revise DSER. It should be noted that CAR Section 7.2.4.3.2 discusses "portable CO_2 extinguishing systems for gloveboxes.
7-9	Agree.	(Nitrogen systems): Will revise DSER.
7-10	Agree.	(polycarbonate panels): will revise DSER
7-11	Agree.	(Smoke detectors): Will revise DSER.
7-12	Agree.	(Combustible liquids): Will revise DSER.

7-13	Agree.	(Fire barrier): Will revise DSER
7-14	Agree.	(Self-closing doors): Will revise DSER
7-15	Agree.	(Tertiary confinement): Will revise DSER
7-16	Agree in part.	(Extraneous references): References to NFPA 31 and 58 will be removed. See comment 7-7 regarding NFPA 20 & 22.
7-17	Under review.	(Exterior structural elements): Staff continuing to review.
7-18	Agree.	(Smoke detection) will revise DSER
7-19	Agree.	(fire barriers): will revise DSER

Chapter 8, Chemical Safety

8-1	Agree in part.	(laboratory explosions): Section 5.5.2.4.6.9 of the CAR does state "... safety strategy using both prevention and mitigation is adopted, etc." for the facility worker. However, Table 5.5.19 of the CAR does state that, for all receptors, laboratory explosions are mitigated by the C3 confinement system. This will be clarified in the next revision of the DSER by adding the appropriate text to page 8.0-6 . In addition, the DCS response states, "... safety strategy utilizing both prevention and mitigation is adopted. ... specific safety features will be adopted as part of detailed design." This is extremely general and does not identify the safety strategy, PSSCs, and design bases for protecting the worker from laboratory explosions. As stated in Section 8.1.2.1.2.3 of the draft SER, the staff expects the applicant to clarify the safety strategy and associated PSSCs/design bases for protecting the worker from laboratory explosions. During the in-office review on August 28, 2002, DCS stated that it will provide information in the revised CAR that will address laboratory explosions, most likely using administrative controls as PSSCs.
8-2	Agree in part.	(laboratory explosions): DCS misinterprets the staff finding at DSER section 10.2. In DSER section 10.2, the staff conditioned its acceptance of the overall safety strategy on the results of the staff's continuing review of the revised safety assessment results. A summary of the revised results were submitted by DCS on March 8, 2002. The focus of the staff's continuing review is the acceptability of parameter values used in the environmental protection consequence analysis. The staff has not, at this time, found these assumptions and results to be acceptable. Further, since the DCS consequence analysis is integral to the staff's finding of an acceptable overall strategy to prevent or mitigate consequences of concern, the staff's "concern about the overall

safety strategy for environmental protection" (DSER section 8.1.2.1.2.3) is, in fact, both consistent with the staff's finding in DSER section 10.2 and fully justified.

With regard to the quantity of material assumed by DCS to be involved in the laboratory explosion event, staff understands that an additional 500 grams of unpolished plutonium dioxide material would be indirectly at risk in an explosion. The staff will revise the DSER.

8-3 Under review. (chemical consequences): Staff is continuing its review of the DCS response with respect to the reagents building, operator actions outside of the control room, and delivery of chemicals.

Disagree The applicant discusses the aqueous polishing building (BAP) and states that the PSSCs for protection against radiological exposure or criticality also provide adequate protection for facility workers from chemical exposure from licensed materials and hazardous materials produced from licensed materials (the only exception is the ECR air conditioning system, discussed under 8-6). The staff notes that the list of PSSCs (CAR Table 5.6-1) does not identify safety functions for chemical releases. As discussed in Section 11.2 of the DSER, the staff concludes some chemical releases from radioactive materials will not be mitigated by PSSCs for radiological safety and could impact facility and site workers. Chemical release modeling is discussed further in 8-4.

8-4 Under review. (chemical consequences): Staff is continuing its review of the DCS response.

8-5 Agree in part. (N_2O_4): The original text of Chapter 8 said NOx - it was inadvertently changed to N_2O_4. N_2O_4 is part of NO_X. Will change it back to NO_X.

8-6 Disagree. (chem PSSCs and chem handled by Rad PSSCs): The applicant is referring to text taken from Section 8.1.2.4 of the draft SER, entitled "Chemical Accident Consequences." In the context of the section, only chemical (non-rad) releases are being discussed. The DSER text is referring to Section 5.5.2.10.6.1, page 5.5-44 of the CAR , "Events Involving Only Hazardous Chemicals," which identifies the Emergency Control Room Air Conditioning System as the PSSC; no other PSSCs are mentioned in this section of the CAR. The staff will explicitly add this reference to the text. As noted in Section 8.1.2.4, there are at least five chemicals that have the potential for severe effects at distances beyond 100 meters from the release and would likely impact the ECR habitability. The applicant has identified the ECR air conditioning system as including an acid gas cartridge and/or an organic vapor cartridge and HEPA filter cartridges (CAR Section 11.4.2.7.3). The other PSSCs listed in CAR Table 5.6-1 do not have identified

		safety functions for releases of these or other hazardous chemicals. The staff has identified open items in this area (see DSER page 8.0-26).
8-7	Agree.	Staff will review the additional information and the revised CAR when they become available.

Chapter 9, Radiation Safety

9-1	Disagree	In response to open item ES-1, DCS submitted a revised safety assessment summary on March 8, 2002. In this response, DCS states (pg. 54) "CAR Table 5.6-1 will also be revised to include a new principal SSC for fire events involving gloveboxes. This new principal SSC, 'Glovebox Fire Protection Features,' is used to describe design features and operating controls that ensure fires in fire areas containing gloveboxes are unlikely to result in intermediate consequences to the environment..." This is a prevention strategy. The safety strategy for the site worker, the public and the environment had previously involved the use of the C3 confinement system as the principal SSC to mitigate the consequences of the fire. However, the C3 confinement system alone did not adequately reduce the risk to the environment. NRC understands that the additional principal SSC, Glovebox Fire Protection Features, would serve to further reduce the risk to the environment. Therefore, the staff interprets these statements as commitments to <u>both</u> a preventive strategy (for the environment) and mitigative strategy (for the site worker and the public) for fires in the AP/MP C3 Glovebox Areas.
9-2	Agree.	Will revise DSER.
9-3	Agree.	Will revise DSER.

Section 11.2, Aqueous Polishing Process and Chemistry

<u>Section entitled "Clarification/Correction of Statements"</u>

11.2-1 Agree in part.	(Pu feedstock): Per the 7/9/2002 letter, DCS has indicated they are evaluating the effect of alternate feedstock materials and will submit any changes in the feed design basis in a future CAR revision. This is consistent with the DSER. Per NRC 6/27/02 letter AP-7, the staff remains concerned that physical parameters, such as morphology and matrix, may influence the design of the facility and safety design bases may be needed. DCS has not provided such design bases or has not justified why morphology and matrix are not design bases.
11.2-2 Disagree.	(electrolyzer): The statement is taken out of context; the NRC staff is not implying that the plutonium processing rate is a design

basis. Clarifying text will be added. As stated on pages 11.2-7 and 11.2-8 of the draft SER, and in items AP-1, AP-2, AP-3, and AP-4 of the NRC's 6/27/02 letter, the staff remains concerned that additional design bases and potential PSSCs in and around the electrolyzer may be needed. The applicant should provide such information or justify why none is required.

Section entitled "Disagreement with Conclusions"

11.2-3 Disagree. (electrolyzer): The statement is taken out of context on page 11.2-8 of the DSER. The staff notes that electrolyzers used in industry often have more safety items identified than just overtemperature. As stated on pages 11.2-7 and 11.2-8 of the draft SER, and in items AP-1, AP-2, AP-3, and AP-4 of the NRC's 6/27/02 letter, the staff remains concerned that additional design bases and potential PSSCs in and around the electrolyzer may be needed. The applicant should provide such information or justify why none is required.

11.2-4 Disagree. (electrolyzer): The statements are taken out of context from pages 11.2-8 and 11.2-9 of the DSER. On page 11.2-7 of the DSER, the staff notes a number of SSCs and actions performed by the applicant (e.g., limit voltage) that imply safety functions. In addition, the potential for flammable gas explosion due to non-plutonium radiolysis and other phenomena (electrolysis) is not addressed. As stated on pages 11.2-7 and 11.2-8 of the draft SER, and in items AP-1, AP-2, AP-3, and AP-4 of the NRC's 6/27/02 letter, the staff remains concerned that additional design bases and potential PSSCs in and around the electrolyzer may be needed. The applicant should provide such information or justify why none is required. (see also 5-8, bullets 1-4)

11.2-5 Disagree. (acute chemical exposure): See response to 8-3.

11.2-6 Disagree. (solvent recovery cycle): The statement is taken out of context from page 11.2-12 of the DSER. The statement is clearly discussing design bases specific to this unit, and, within the same sentence, mentions the concerns about red oil and HAN/hydrazine. The applicant has committed to providing more information - and design bases as necessary - for red oil, HAN/hydrazine, and solvent temperature.

11.2-7 Disagree. (oxalic precipitation): The statements are taken out of context from pages 11.2-14 and 11.2-17 of the DSER, where acidification is discussed as a potential safety function for loss of confinement events leading to a rad/chemical release. The open item is discussed in Section 11.2.1.2.. As stated on pages 11.2-14 and 11.2-17, the staff notes that the applicant is not relying upon concentration controls to prevent a nuclear criticality in these units.

11.2-8 Agree in part.	(calciner furnace bearing): Page 11.2-14, paragraph 6 contains the factual statement that the applicant has not identified nitrogen cooling as a safety function. The DSER refers the reader to Section 11.9 for a discussion about the open item on the designation of the nitrogen cooling system and to Section 11.2.1.2 for a discussion on the open item for loss of confinement leading to chemical releases. See discussion in 5-8 above.
11.2-9 Disagree.	(offgas unit and chemical releases): see the response to 8-3. For clarification, the staff will add text referring the reader back to the chemical consequence discussion in Section 8.

<u>Section entitled "Resolution of Open Items"</u>

11.2-6 Agree in part.	(electrolyzer design basis): The staff finds it helpful that the applicant has identified multiple redundant temperature sensors as part of the process safety I&C system, identified as the PSSC for "shut down process [electrolyzer] prior to exceeding temperature safety limits." The staff notes, however, that the applicant has not provided assurances that the source of heating corresponds to the location of the expected highest temperature in the electrolyzer. In addition, the applicant has not addressed the staff concerns about the potential for additional design bases and PSSCs for the electrolyzer areas or justified why none are needed (see AP-1, AP-2, and AP-3 in the NRC letter of 6/27/2002 and electrolyzer open items in DSER).

Section 11.4, Ventilation and Confinement Systems

11.4-1 Agree.	Will revise DSER.
11.4-2 Agree in part/ Clarification needed.	What is "unclear?"
11.4-3 Agree.	Will revise DSER.
11.4-4 Disagree.	If the words "for fire protection" are removed, then it is not clear what is used for fire protection.
11.4-5 Agree.	Will revise DSER.
11.4-6 Agree.	Will revise DSER.
11.4-7 Agree.	Will revise DSER.
11.4-8 Agree.	Will revise DSER.

Section 11.5, Electrical Systems

11.5-1	Agree.	Will revise DSER.

Section 11.6, Instrumentation and Control Systems

11.6-1	Agree.	Staff will add a sentence in the DSER to state that the utility control system is not a PSSC. Staff agrees with DCS that the "safety system" in the utility control system is not a DCS declared PSSC. Staff will review for consistency what will be written by DCS to clarify terms associated with "safety systems" when open item SA-1 is closed.
11.6-2	Agree.	Staff will delete the word "sensors" from the first sentence of DSER section 11.6.1.1.2.4. Staff will review future DCS change to see if the Profibus or some other data multiplexing method will be covered by a code or standard if a particular sensor is declared a PSSC by DCS.
11.6-3	Clarification needed.	The description of the ventilation system for the emergency control rooms that each control room has a single ventilation system that is independent disagrees with the CAR description on page 11.6-5, first paragraph. Statement regarding priority of controls disagrees with CAR description on page 11.6-5, first paragraph.
11.6-4	Agree.	Staff will add sentence "safety controllers in the utility control system are not PSSCs." Staff will review the DCS CAR amendment that will describe the location of the safety controllers as noted in DCS response last sentence.
11.6-5	Agree.	Staff will change the first sentence to "....PSSCs are the emergency control system and the AP and MP safety control subsystems...." Staff will review future submittal of DCS response to open item SA-1 for consistency with this DSER change.

Section 11.8, Fluid Transport Systems

11.8-1	Agree	Will revise DSER.
11.8-2	Agree.	Will revise DSER
11.8-3	Agree.	No change necessary.
11.8-4		Will review and revise DSER as necessary.

Section 11.9, Fluid Systems

11.9-1	Agree.	Will revise DSER.
11.9-2	Agree.	Will revise DSER.
11.9-3	Agree.	Will revise DSER.
11.9-4	Agree.	Will revise DSER.

Chapter 12, Human Factors Engineering for Personnel Activities

12.1	Agree.	Will revise DSER.

Chapter 15, Management Measures

15-1	Agree.	Will revise DSER.
15-2	Agree.	Will revise DSER.

Editorial Comments

General

E-1	Agree.	Will revise DSER.

Section 1.1, Facility and Process Overview

E-2	Agree.	Will revise DSER.
E-3	Agree.	Will revise DSER.

Section 1.3, Site Description

E-4	Agree.	Will revise DSER.
E-5	Agree.	Will revise DSER.

Chapter 5, Safety Assessment of the Design Basis

E-6	Agree.	Will revise DSER.
E-7	Agree.	Will revise DSER.
E-8	Agree.	Will revise DSER.
E-9	Agree.	Will revise DSER.

E-10	Agree.	Will revise DSER.
E-11	Agree.	Will revise DSER.
E-12	Agree.	Will revise DSER.
E-13	Agree.	Will revise DSER.
E-14	Agree.	Will revise DSER.
E-15	Agree.	Will revise DSER.

Chapter 6, Nuclear Criticality Safety

E-16	Agree in part.	While the second part of the second sentence is true, it is contained in the definition of double contingency principle. Will revise DSER.
E-17	Agree.	Will revise DSER.
E-18	Agree in part.	The word "methods" will be added after the phrase "criticality code validation." Additional text provided by DCS is not needed. Will revise DSER.
E-19	Agree in part.	Text will be added to reflect the fact that the values are the conservative modeled values; however, the values in the DSER will not be changed. Will revise DSER.

Chapter 7, Fire Protection

E-20	Agree	Will revise DSER.

Chapter 8, Chemical Safety

E-21	Agree.	Will revise DSER.
E-22	Agree.	Will revise DSER.

Chapter 9, Radiation Safety

E-23	Agree	Will revise DSER.

Chapter 10, Environmental Protection

E-24	Agree	Will revise DSER.

Section 11.1, Civil-Structural

E-25	Agree.	Will revise DSER.

E-26	Agree.	Will revise DSER.

Section 11.4, Ventilation and Confinement Systems

E-27	Agree.	Will revise DSER.

Section 11.5, Electrical Systems

E-28	Agree.	Will revise DSER.
E-29	Agree.	Will revise DSER.

Section 11.6, Instrumentation and Control Systems

E-30	Agree.	Will revise DSER.
E-31	Agree.	Will revise DSER.
E-32	Agree.	Will revise DSER.
E-33	Agree.	Will revise DSER.

Section 11.8, Fluid Transport Systems

E-34	Agree	Will revise DSER.
E-35	Agree	Will revise DSER.

Section 11.9, Fluid Systems

E-36	Agree	Will revise DSER.
E-37	Agree	Will revise DSER.

Chapter 12, Human Factors Engineering for Personnel Activities

E-38	Agree.	Will revise DSER.
E-39	Agree	Will revise DSER.
E-40	Agree	Will revise DSER.

Chapter 15, Management Measures

E-41	Agree	Will revise DSER.
E-42	Agree.	Will revise DSER.
E-43	Agree.	Will revise DSER.

Appendix A

E-44	Agree.	Will revise DSER.