Entergy

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Jerry C. Roberts
Director
Nuclear Safety Assurance

June 29, 2000

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Grand Gulf Nuclear Station
Docket No. 50-416
License No. NPF-29
Response to Request for Additional Information Related to Amendment Request for Implementation of the Alternate Source Term (TAC NO. MA8065)

Reference:

1. Grand Gulf Nuclear Station, Unit 1 – Request for Additional Information Re: Amendment Request for Implementation of the Alternate Source Term (TAC No. MA8065) (GNRI-2000/00047)

2. GGNS Pilot Full-Scope Application of NUREG-1465 Alternative Source Term Insights, LDC 1999-082 (GNRO 2000/20005)

GNRO-2000/00052

Ladies & Gentlemen:

As discussed with Mr. Jerry Roberts and later followed up by Reference (1), Entergy Operations Inc is providing the following response to your Request for Additional Information (RAI). The following response only addresses those items not affected by the reanalysis required to correct the $\chi$/Q errors in the original submittal Reference (2).

As discussed with the Grand Gulf Project Manager our intent is to respond to as many questions, as possible, in order to keep the licensing review process moving forward. During this discussion Grand Gulf stated that a supplemental response would be prepared and submitted by the end of July correcting the identified erroneous information.

Based on our review of the RAI and the impact of the identified errors we are only able to respond to questions one through nine of the original fourteen questions documented in Reference (1).

| COMMITMENT | TYPE (Check only one type) ONE-TIME ACTION | CONTINUING COMPLIANCE | SCHEDULED COMPLETION DATE (If Required) |
|---|---|---|---|
| **Provide a supplemental response correcting the erroneous information in the original amendment request.** | **Yes** | **No** | **July 31, 2000** |
| **Provide any changes to the original assumption in the supplemental response, per response to question 4.** | **Yes** | **No** | **July 31, 2000** |
| **Revise the applicable emergency procedures to call for a ph test in the event the suppression pool water contains substantial amounts of iodine in the late phases of the accident.** | **No** | **Yes** | **After approval of request.** |

Yours truly,

LFD

Attachment: Grand Gulf Nuclear Station Response to Request for Additional Information Dated May 9, 2000

cc:

J. L. Dixon-Herrity (GGNS Senior Resident) (w/a)
D. E. Levanway (Wise Carter) (w/a)
N. S. Reynolds (w/a)
L. J. Smith (Wise Carter) (w/a)
H. L. Thomas (w/o)

Mr. E. W. Merschoff (w/2)
Regional Administrator
U.S. Nuclear Regulatory Commission
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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

bcc:

C. G. Anderson (ANO-VP)
C. A. Bottemiller (GG-NSAPL)
M. K. Brandon (W3-NSAPL)
C. M. Dugger (W3-VP)
W. A. Eaton (GG-VP)
R. K. Edington (RBS-VP)
D. E. James (ANO-NSAPL)
R. J. King (RB-NSA)
M. A. Krupa (ECH-NSL)
C. W. Lambert (GG-ENG)
J. W. Leavines (RB-NSAPL)
E. P. Perkins (W3-NSA)
J. C. Roberts (GG-NSA)
W. M. Shelly (GG-TRNG)
J. D. Vandergrift (ANO-LIC)
J. E. Venable (GG-GMPO)
GGN Central File (16)
GGN Plant Licensing

1. You have proposed that the maximum allowable main steam isolation valve (MSIV) leak rate be increased to less than or equal to 100 standard cubic feet per hour (scfh) per main steam line with a total leak rate through all four main steam lines of less than or equal to 250 scfh. In the current Grand Gulf Nuclear Station, Unit 1 (Grand Gulf) updated final safety analysis report (UFSAR), Section 6.7, you stated that the air blower in the outboard MSIV leakage control system (LCS) is rated at 100 standard cubic feet per minute (scfm) and the MSIV-LCS adds about 50 scfm to the standby gas treatment system (SGTS). Reevaluate the MSIV-LCS design and operation to ensure that the existing MSIV-LCS is capable of processing 250 scfh leak rate through the SGTS.

   Response:
   EOI has confirmed the capability of the GGNS MSIV-LCS to process up to 100 scfh of MSIV leakage per steamline. This evaluation reviewed the capacities of both the inboard and outboard MSIV LCS subsystems and confirmed that each system can process the proposed MSIV leakage rates. The outboard system is supplemented with blowers that are sized to adequately handle this additional MSIV leakage while maintaining sub-atmospheric pressures in the steamlines. The inboard system has been determined to have the capability of processing up to 150 scfh per steamline. Since this inboard value would include back-leakage from the condenser past the outboard MSIV, EOI will implement the proposed Technical Specification in the Local Leakage Rate Testing program with a maximum of 150 scfh per steamline and a maximum MSIV leakage rate of 100 scfh. This evaluation also confirmed the MSIV LCS capability to process the proposed 250 scfh total leakage rate. No design or operational modifications to the MSIV LCS are required to accommodate these increased leakage rates.

2. In Section 6.7 of the UFSAR, you stated that the MSIV-LCS adds approximately 100 lbs of steam to the auxiliary building volume served by the SGTS. Reevaluate the SGTS to ensure that the existing design and operation are capable of processing additional steam, resulting from the higher MSIV leak rate you proposed, without affecting aerosol and iodine removal efficiencies. The staff assumes that the MSIV-LCS releases are routed directly to the SGTS air intake.

   Response:
   EOI has confirmed that the SGTS is capable of processing the additional steam associated with the higher MSIV leak rates. As described in SAR 6.5.3, the SGTS filter trains are equipped with demisters and heaters that are sized to reduce the humidity of the incoming flow from 100 to 70 percent with significant additional margin in the heaters. Consequently, the steam released from the additional MSIV leakage would not impact the SGTS aerosol or iodine removal efficiencies.

3. You have proposed that the maximum allowable unfiltered air in-leakage into the control room be increased to 1200 cubic feet per minute (cfm) from the current limit of 590 cfm. The staff is currently participating in a NRC-industry initiative to resolve generic issues related to control room habitability; in particular, the validity of control room unfiltered air infiltration rates assumed by licensees in their control room habitability assessment. Meanwhile, the staff will consider the proposed unfiltered air in-leakage rate into the control room for review of this amendment request, which may be completed prior to the resolution of the control room habitability generic issues. However, the review and approval of this amendment does

not exempt Grand Gulf from regulatory actions that may be implemented in the future as generic issues are resolved. State your adherence to the NRC-industry initiative effort.

Response:
Grand Gulf is an active member of the Nuclear Energy Institute (NEI) Taskforce developing the revision to the NEI guidance document NEI 99-03. As such, we are continually aware of the industry efforts on going to resolve this issue.

Entergy will consider the implications of the final resolution on this matter and evaluate any formulated guidance published either by the industry or the Commission as part of the resolution of the concern. Until such time as final guidance or regulation is formulated Entergy will continue to work closely with the industry efforts and the staff on this issue.

4. The staff issued draft regulatory guide DG-1081, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," for public comment. This draft guide provides, among other things, guidance on the assumptions and methods to be used in the design basis accident (DBA) radiological consequence analyses in conjunction with new accident dose criteria. State if you made any exceptions or deviations from the guidance provided in this draft regulatory guide.

   Response:
   EOI has reviewed the most recent available revision of DG-1081 (September 1999) which was included as Attachment 2 to SECY-99-240 and the following deviations were identified.

Section 5.7 of Appendix A to DG-1081

This section reports that the iodine released from ESF liquid leakage should be assumed to be 97% elemental and 3% organic. The GGNS calculations assume this release is 100% elemental based on earlier Staff guidance. This assumption of iodine species makes no differences on the results of the calculation since the SGTS charcoal efficiencies for the removal of organic and elemental iodine are equivalent.

Section 1.3 of Appendix B to DG-1081

This section reports that the iodine released from the fuel should be assumed to be 99.75% in the elemental form and 0.25% in the organic species. The GGNS evaluation applies this distribution; however, in light of current Staff positions, GGNS is currently considering the impact of a larger fraction of the iodine in the gap to be in the aerosol species and the potential for long-term iodine re-evolution. Any changes to this assumption will be highlighted in the upcoming July 2000 submittal.

Section 2 of Appendix B to DG-1081

The GGNS analysis applies the reported decontamination factors for elemental and organic iodine of 500 and 1, respectively. In addition, the particulate iodine are assumed to be retained in the pool water consistent with Section 3 of Appendix B to DG-1081. Considering the iodine species distribution of 99.75% in the elemental form and 0.25% in the organic species, the overall effective decontamination factor can be calculated to be 222. A value of 222 was applied in the GGNS fuel handling accident instead of the overall effective value of 200 reported in DG-1081.

$$\text{Overall Iodine DF (23 feet)} = \frac{1}{\underset{\text{elem.}}{\frac{0.9975}{500}} + \underset{\text{org.}}{\frac{0.0025}{1}}} = 222$$

As described above, GGNS is currently considering an updated iodine species distribution, which can impact this decontamination factor. Any changes to this assumption will be highlighted in the upcoming July 2000 submittal.

<u>Section 3.6 of Appendix C to DG-1081</u>
This section reports that the iodine released from the condenser should be assumed to be 97% elemental and 3% organic. The GGNS calculations assume this release is 100% elemental based on earlier Staff guidance. This assumption of iodine species makes no differences on the results of the calculation since this turbine building release is not exposed to any type of filtration.

5. You assumed the engineered safety features (ESF) system leakage to begin at 10 minutes after the accident (or 8 minutes after the beginning of the gap release) and a total leakage rate from the full complement of ESF systems during its recirculation phase to be 2.32 E5 cubic centimeter per hour (cc/hr). Provide the bases for this assumption. State how this requirement is monitored during plant operation and what action(s) are required if the leakage exceeds this limit.

   Response:
   EOI interprets this leakpath as any potential path through which suppression pool inventory can leak into the Auxiliary Building atmosphere. A review of the containment penetrations identified one leakpath associated with the refueling water transfer pumps through which suppression pool inventory could enter the Auxiliary Building atmosphere in the event of a break in non-safety piping. The maximum leakage rate associated with this path is assumed to be 1 gallon per minute and is confirmed via testing of the penetration's containment isolation valves under the GGNS Appendix J Testing Program. Excessive leakage results in a Condition Report and valve maintenance as appropriate.

   The potential leakage associated with the operation of a full complement of ESF systems was evaluated through a detailed review of the potential leakage points in the ESF systems, specifically valve stems and pumps seals. This review resulted in a maximum total ESF liquid leak rate from all ECCS of 1.25 gallons per hour (~0.02 gallons per minute). The integrity of these systems is confirmed via the ASME Section XI Pressure Testing program and periodic walkdowns associated with the Leakage Reduction program.

   The leakage reduction program is implemented to reduce leakage from systems outside the Primary Containment that could contain highly radioactive fluids following an accident. Program elements include design features to minimize leakage; instrumentation to detect gross leakage within the Reactor Building; visual examinations during system operation; periodic leakage tests; a corrective action program to correct leakage problems; and preventative maintenance activities. The purpose of the program is to detect and correct degradation of the pressure boundaries of the systems, thereby reducing potential post-accident releases and resultant dose consequences. The corrective action process would identify any excessive leakage and prioritize corrective actions accordingly.

Based on these two leakpaths, a total liquid leakage of 1.02 gpm (2.32E5 cc/hr) from the suppression pool to the Auxiliary Building is assumed in the GGNS LOCA analysis.

Considering the proposed scenario of a large-break unmitigated LOCA, the ESF systems are assumed to be unavailable for mitigating the core damage for approximately 2 hours after the accident. However, the containment spray system could potentially be automatically initiated to spray the containment within 10 minutes of the accident if high containment pressure is sensed. As such, this calculation conservatively assumes that the ESF system leakage begins at 10 minutes after the LOCA. The airborne containment leakage analysis conservatively credits a delayed containment spray initiation at 30 minutes.

6. Cesium iodine, entered into the primary containment after a postulated DBA, will dissolve in the suppression pool water forming iodide in solution. The radiation-induced conversion of iodide in the suppression pool water into elemental iodine is strongly dependent on pH. In NUREG-1465, the staff stated that if credit is to be given for long-term retention of iodine in the suppression pool, maintenance of the suppression pool water pH at or above a level of seven must be demonstrated. Describe the capability of your post-accident sampling system to monitor or analyze long-term suppression pool water pH during late-phase of the postulated DBA.

   Response:
   As described in SAR Section 9.3.2.2.4, the GGNS Post-Accident Sampling System (PASS) has the capability to take grab samples from the suppression pool water and to perform chemical analyses. Although these laboratory analyses include pH determination, this test is not currently performed since it gives no indication of the extent of core damage. Considering the role of pH in predicting a late-term iodine release, GGNS will revise the applicable emergency procedures to call for a pH test in the event the suppression pool water contains substantial amounts of iodine in the late phases of the accident.

7. Discuss in detail the capability and potential use of the standby liquid control system (SLCS) for controlling and maintaining long-term suppression pool water pH levels to seven or above if needed during late-phase of the postulated DBA.

   Response:
   As described in SAR 9.3.5, the GGNS SLCS was installed to mitigate an anticipated transient without scram (ATWS) event in compliance with 10CFR50.62. This system was designed to be initiated in the event that reactor shutdown could not be maintained with the control blades. The application of this system was reviewed in detail for this new application of controlling post-accident suppression pool pH.

   The SLCS equipment essential for injection is designed as seismic Category I and the essential electrical components are powered from the standby ac power supply. The system is manually initiated by key-locked switches in the control room. The system components including the SLC tank, pumps, and valves are located in the containment and the liquid is piped to the HPCS discharge piping from which it is injected into the reactor vessel via the HPCS sparger. However, since the original SLC function was for ATWS mitigation, which does not include significant source term releases, these SLC components are not currently addressed in the GGNS Environmental Qualification program.

In the event of an unmitigated LOCA and the associated core uncovery, the GGNS Severe Accident Procedures would call for the injection of SLCS into the reactor, as well as any other available water source. Although this solution is directed into the reactor vessel, it would eventually make its way out the break and into the suppression pool. The operation of the ECCS would maintain the suppression pool well-mixed ensuring the sodium pentaborate was distributed throughout the pool. Since the saturation temperature of the sodium pentaborate solution is 70 °F at the maximum injection concentration, precipitation of the diluted SLC solution would not be anticipated in the post-accident suppression pool.

8. State if it is amenable to include the potential use of the SLCS for controlling and maintaining long-term suppression pool water pH levels in the Grand Gulf accident management procedure as a accident mitigation strategy to minimize on-site and off-site radioactivity releases following the postulated DBA.

   Response:
   As discussed above, the GGNS Severe Accident Procedures would call for the injection of SLCS into the reactor, as well as any other available water source. Since this SLC solution would eventually end up in the suppression pool, mixed by the ECCS systems, EOI feels that this system provides additional assurance that the GGNS suppression pool will not experience a late-term pH transient in this accident scenario. Consequently, EOI is amenable to including the potential use of the SLCS as a backup method for controlling suppression pool pH levels as long as environmental qualification of the SLCS components is not necessary.

9. Discuss any other alternative accident mitigation strategies to ensure the control and maintenance of long-term suppression pool water pH levels, such as use of the condensate storage tank by adding pH control chemicals directly to the tank after the postulated DBA, and making it available to the reactor vessel injection systems.

   Response:
   GGNS has a variety of means of introducing aqueous pH control chemicals from outside sources into the containment in the event they are necessary. GGNS Emergency Procedures currently contain instructions on how to mix up a batch of sodium pentaborate in the CST with chemicals available in the warehouse and inject this solution into the reactor vessel with HPCS or RCIC. The HPCS system can also be aligned to inject this solution directly into the GGNS suppression pool. If available, the non-safety condensate and refueling water transfer pumps can also be used to inject dissolved pH control chemicals from the condensate and refueling water storage tanks into the containment.

## NRC SUBMITTAL REVIEW FORM

GNRO: 2000/00052

RESPONSE DUE: 6/30/2000

**Subject:** Response to Request for Additional Information dated May 9, 2000. Request deals with amendment requesting implementation of alternate source term.

SECTION I **Commitment/Licensing Document Update**

| | |
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| **Does this package contain any information or analyses of new safety issues performed at NRC request or to satisfy a regulatory requirement? If Yes, reflect requirement to update the UFSAR in Section II.** | NO |
| **Does this package request NRC approval of a change that will require UFSAR, TS Bases or other Licensing documents to be updated if approved? If Yes, reflect requirement to update the applicable Licensing document in Section II.** | NO |
| **Does this letter contain commitments or require procedure changes? If Yes, Reflect information in the Section II.** | YES |

SECTION II **TO DO LIST FOR LETTER ISSUANCE**

| ACTION(s) NEEDED<br>*NOTE: ACTION NEEDED UPON APPROVAL WILL BE REFLECTED IN THE LDC IMPLEMENTATION CHECKLIST OR OTHER APPROVED IMPLEMENTATION PROCESS.* LIST ANY DUE DATES BELOW. | Location In Submittal (para#/page#) | RESP DEPT or REVIEWER | ACTION PERFORMED or ACTION NEEDED UPON APPROVAL MANAGEMENT SIGNOFF/DATE (PRINT NAME/SIGNATURE) signature, electronic review, or telcon |
|---|---|---|---|
| Certification | Cover Letter as a whole | Safety Analysis | Greg Broadbent G.E. Broadbent |
| Certification | Response to question no. 1. | Safety Analysis | Greg Broadbent G.E. Broadbent |
| Certification | Response to question no. 2. | Safety Analysis | Greg Broadbent G.E. Broadbent |
| Certification | Response to question no. 3. | Nuclear Safety & Licensing | Lonnie Daughtery [signature] |
| Certification | Response to question no. 4 | Safety Analysis | Greg Broadbent G.E. Broadbent |
| Certification | Response to question no. 5 paragraph #2 last sentence and paragraph #3. | Engineering Programs | Kevin Christian SEE ATTACHED |
| Certification | Response to question no. 5 remaining portion | Safety Analysis | Greg Broadbent G.E. Broadbent |
| Certification | Response to question no. 6 sentences #1 and #2. | Chemistry | Keith O'Neal See ATTACHED |
| Certification | Response to question no. 6. | Safety analysis | Greg Broadbent G.E. Broadbent |

| | | | |
|---|---|---|---|
| Certification | Response to question no. 7. | Safety Analysis | Greg Broadbent<br>G.E. Broadbent |
| Certification | Response to question no. 8 | Safety Analysis | Greg Broadbent<br>G.E. Broadbent |
| Certification | Response to question no. 9. | Safety Analysis | Greg Broadbent<br>G.E. Broadbent |
| Management Review | Entire letter. | Safety Analysis | Mike Withrow<br>for M.D. Withrow |
| Management Review | Entire Letter | Plant General Manager | Joe Venable<br>6/29/00 |
| Management Review | Entire letter | Director Engineering | Craig Lambert<br>6/29/00 |
| FINAL DOCUMENT SIGNOFF | N/A | NSA DOCUMENT PREPARER | 6/29/00 |
| FINAL DOCUMENT SIGNOFF | N/A | Director NSA | Jerry C Roberts<br>6/29/00 |

| COMMENTS |
|---|
| ~~N/A~~ indent title on page 2 that starts with "Section 5.7..." to be consistent with others. -G.E.B. |

Attachments: Certification Forms

# NRC SUBMITTAL REVIEW FORM

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| Certification | Response to question no. 5 paragraph #2 last sentence and paragraph #3. | Engineering Programs | Kevin Christian<br>Kevin [signature]<br>6/29/2000 |
| Certification | Response to question no. 5 remaining portion | Safety Analysis | Greg Broadbent |
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| Certification | Response to question no. 6 sentences #1 and #2. | Chemistry | Keith O'Neal<br>Keith O'Neal |
| Certification | Response to question no. 6. | Safety analysis | Greg Broadbent |

# CERTIFICATION FORM

**METHOD OF CERTIFICATION:** ☒ Objective Evidence ☐ Peer ☐ Both

RESP DEPT: Engineering/Safety Analysis

## SUBJECT OF WHAT IS BEING CERTIFIED AND REFERENCES

Various sections (as defined by the review form) of GNRO-2000/00052, the response to the RAI on the alternative source term submittal in GNRO-2000/20005, is being certified. See attached discussion and references for certified information.

**Initiator**

| (Printed Name/Signed Name) | DEPT | DATE |
|---|---|---|
| G.E. Broadbent / G.E. Broadbent | Eng/SA | 6/29/00 |

Signature indicates that a thorough review has been conducted of the submittal content, as applicable to your department, and is the basis for the certification. This signature certifies that a review has been performed to confirm the technical content of the information being certified is accurate and complete.

**Peer Review***

| (Printed Name/Signed Name) | DEPT | DATE |
|---|---|---|
| N/A | | |

*Peer review signature is required if objective evidence is not available.
If substantiating objective evidence is the only review method; This block may be marked "NA". This signature certifies that an independent review has been performed to confirm the technical content of the information being certified is accurate and complete.

1. Per Guy Spikes:
The MSIV Leakage Control System (LCS) consists of two independent subsystems, inboard and outboard, each capable of performing the intended system function. The inboard subsystem contains one leakage path per steam line. Each leakage path discharges to an area of the auxiliary building served by the SGTS. The single leakage path is capable of handling both the initial depressurization of the steam line and the long-term leakage from the MSIV's. Currently, the maximum allowable steam line leakage rate is 100 scfh total for all four steam lines. However, leakage past the inboard and outboard MSIV's is administratively controlled to ≤25 scfh per valve. Therefore, the inboard MSIV LCS subsystem is currently required to maintain subatmospheric pressure in the main steam line for long term leakage rates up to 50 scfh per steam line (25 scfh/MSIV x 2 MSIVs).

The proposed allowable MSIV leak rate limit is 100 scfh total per main steam line. Therefore, one steam line could see as much as 100 scfh total leakage. The inboard MSIV-LCS subsystem has been re-analyzed for this increased leakage rate and found to adequately process the increased leakage, maintain subatmospheric pressure in the steam line, and satisfy all other design criteria for the leakage control system.

The outboard MSIV LCS subsystem operates in two process modes: depressurization and long-term bleedoff. This subsystem contains one depressurization and one leakage path for all four steam lines. During depressurization mode, steam in the main steam lines between the outboard MSIV and turbine shutoff valves is discharged to an area of the auxiliary building served by the SGTS. During the long-term bleed-off mode, leakage is diverted to two parallel blowers that discharge to a building volume served by SGTS. The blowers establish the required subatmospheric pressure in the steam lines. A dilution air line upstream of the blower suction is provided to reduce the temperature of the gases discharged within the SGTS boundary during bleed-off mode.

The GGNS USFAR states that the outboard subsystem blowers are rated at 100 scfm each. The blowers are actually rated at 100 scfm at –60 inches of water and 120 scfm at –50 inches of water. For the current MSIV leakage limits (100 scfh total), the outboard MSIV-LCS subsystem will see leakage flows (in long-term bleed-off mode) of up to 240 scfm (14,400 scfh): 2400 scfh total steam line leakage (100 scfh MSIV leakage plus 2300 scfh stop valve leakage) plus dilution air flow equal to 5 times leakage flow (12,000 scfh). Thus, each blower handles 120 scfm flow. The proposed leakage limits (250 scfh total) add 150 scfh leakage, resulting in an increase of 7.5 scfm (6.25%) flow at each blower. The outboard subsystem will need to process up to 255 scfm leakage, or 127.5 scfm per blower. The blowers will deliver 127.5 scfm at about –46 inches of water. Therefore, the outboard subsystem and blower should adequately process the increased leakage, maintain subatmospheric pressure in the steam lines, and satisfy all other design criteria for the leakage control system.

The 50 scfm quoted in the GGNS UFSAR as added to the SGTS by the MSIV LCS is the load added to SGTS during the exhaust phase, or during steam line depressurization. Due to the short duration of the MSIV-LCS depressurization mode (6 minutes for the outboard subsystem and 1.5 minutes for the inboard subsystem), this flow rate, and the load on the SGTS, is largely unaffected by the small (2.5 scfm) increase in proposed MSIV leakage

2. Per Guy Spikes:
The MSIV Leakage Control System (LCS) releases are routed to areas of the auxiliary building served by the SGTS (i.e., are within the SGTS envelope). The SGTS flow rate after initial drawdown is limited to 4000 cfm by a flow controller to maintain a 99% efficiency rate for the charcoal filters. This flow rate is unaffected by the proposed higher MSIV leak rates and subsequent additional load on the SGTS from the leakage control system.

The SGTS filter trains are provided with demisters to remove any entrained water droplets in the inlet air stream. They are also equipped with heaters to reduce the relative humidity of the entering air stream to less than 70%. The worst possible situation would be for the heater to see 100% RH air. However, the heaters have in excess of 200% of the required capacity to reduce the humidity in the inlet air to the carbon bed to 70%. Therefore, the existing SGTS is capable of processing the additional steam due to the proposed higher MSIV leakage limits without affecting the aerosol and iodine removal efficiencies of the charcoal filter trains.

4. These deviations were based on a review of Calculations XC-Q1111-98017 (LOCA), 98016 (CRDA), and 98019 (FHA) versus the requirements in DG-1081 as posted on the NRC's website under SECY-99-240. (http://www.nrc.gov/NRC/COMMISSION/SECYS/secy1999-240/1999-240scy.html). DG-1081 is included as an adobe acrobat attachment to this webpage.

5. Per 17-S-05-1, "Local Leak Rate Test Program", Table 1, the acceptance criteria for the P11-F130 and 131 valves is 3785 ml/min, which is 1 gpm. The failure of this acceptance criteria would require a CR and corrective actions. Technical Specification 3.6.1.3.9 would not necessarily be violated since it is the sum of all penetration testing. Per Safety Evaluation 2000-004-R00, "those physical barriers that are explicitly credited by the accident dose analyses to limit liquid leakage from the suppression pool to secondary containment are evaluated by the Leakage Reduction program and the ASME Section XI pressure testing program..."

The additional 0.02 gpm is based on the review in Calculation XC-Q1J11-96007. The basis for the 10 minute initiation assumption in reported in Section 6.1.3 of the AST LOCA dose evaluation, Calculation XC-Q1111-98017.

6. The GGNS capability to evaluate post-accident pH is documented in SAR 9.3.2.2.4. The accident assessment procedure in 10-S-01-35 can be revised to include a step to call for a pH test of the next grab sample in the event that post-accident suppression pool chemistry samples indicate high concentrations of iodine in the pool at later periods in the accident. Based on the pH calculation, this timeframe may be after approximately 4 days depending on cesium hydroxide behavior.

7. The SLC discussion is based on SAR 9.3.5. The lack of EQ qualification is based on ES-19 and discussions with Gerald Lantz. Per Gerald, the GGNS SLC system was exempted from the EQ program via correspondence in AECM-81/335, MPB-85/0362, and MPB-82/144.

8. Per the SAPs in 05-S-01-SAP-1, an unmitigated LOCA would eventually put the plant in SAP-5. Step 32 of this SAP calls for RPV flooding with any available water sources including the SLC boron tank.

9. 05-S-01-EP-2, Attachment 28 "Alternate SLC Injection" provides the directions for injecting sodium pentaborate into the RPV. With HPCS or RCIC. RCIC would not be available in a large-break LOCA. HPCS can inject this directly into the suppression pool by not opening the injection valve and opening E22-F012. Since the procedure is directed at injecting this solution into the RPV, it directs opening the breaker to the F012 valve to ensure it stays closed per Step 2.10 in the procedure. Injection directly into the pool would be a deviation from this procedure. Either way, the borate solution will eventually end up in the suppression pool. Attachment 25 addresses injection into RPV with condensate transfer pumps; however, these non-safety pumps may not be available in the design basis LOCA.