50-416

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 17, 1996

LICENSEE: ENTERGY OPERATIONS, INC.

FACILITY: Grand Gulf Nuclear Station, Unit 1

SUBJECT: SUMMARY OF AUGUST 27, 1996, MEETING ON THE GRADED QUALITY ASSURANCE INITIATIVE

A meeting was held on Tuesday, August 27, 1996, for the Nuclear Regulatory Commission (NRC) staff and the licensee to discuss the staff's questions, comments, and preliminary conclusions on criteria for determining the safety significance of structures, systems and components (SSCs) that were contained in the staff's letter of July 15, 1996. The meeting was held at the request of the NRC at NRC headquarters in Rockville, Maryland. A notice of this meeting was issued on July 26, 1996.

Attachment 1 is the list of attendees. Attachment 2 is a summary of the licensee's presentation in response to the staff's questions, comments, and preliminary conclusions. Attachment 3 is the licensee's expert panel guidance document. There were no handouts by the staff.

The meeting was conducted for the staff to understand the licensee's views on the staff's questions, comments, and preliminary conclusions. No decisions were made by the staff during the meeting.

BACKGROUND:

On July 15, 1996, the staff issued a letter to the licensee as part of the Graded Quality Assurance (QA) Initiative between the NRC and the nuclear power industry for the past two years. Grand Gulf Nuclear Station, Unit 1 (GGNS) is one of several plants voluntarily participating in the initiative. As part of this initiative, the licensee participants and the NRC staff exchange information on the application of risk assessments to QA plan practices. For GGNS, this has meant that the staff has also sent letters of January 24, May 29, and July 18, 1996, to the licensee.

The letter of July 15, 1996, to the licensee was not a request for additional information because there is no application from the licensee for the staff to review and approve. The licensee has voluntarily agreed to address the staff's questions, comments, and preliminary conclusions on the licensee's document entitled "Criteria for Determining the Safety Significance of Plant Structures, Systems and Components for the Grand Gulf Graded Quality Assurance Program," dated October 11, 1995. This document provides the licensee's criteria for determining the safety significance of SSCs as part of grading issues in the licensee's QA program.

The document was attached to the staff's meeting summary issued December 11, 1995, which documented the meeting on October 24, 1995, between the staff and the licensee on procurement of low safety significance components.

The changes to the QA program at GGNS to implement graded QA must conform to regulatory requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," of 10 CFR Part 50 and be consistent with 10 CFR 50.54(a)(2), in that if the changes reduce the commitments in the program they must be submitted to the staff for review and approval.

MEETING SUMMARY:

The agenda for the meeting was for the licensee to have the opportunity to make introductory remarks and then to provide its response to each of the staff's 59 questions, comments, and preliminary conclusions in the staff's letter of July 15, 1996. There would be a discussion after the licensee addressed each question, comment, or preliminary conclusion.

The licensee stated that the questions, comments, and preliminary conclusions may need clarification during discussions, that the staff should in some cases already know the answers, and that in some cases they may involve policy questions that should be properly put to the Commission. The licensee stated that the probablistic risk assessment (PRA) used for GGNS is the Individual Plant Examination (IPE) submitted by the licensee in response to Generic Letter 88-20 and is addressed in the staff's letter of March 7, 1996.

A summary of the licensee's presentation in response to each of the staff's 59 questions, comments, and preliminary conclusions is in Attachment 2. The presentation of the licensee's responses does not imply either agreement or disagreement by the staff with the responses presented by the licensee. This summary documents what was stated by the licensee in the meeting and is not an evaluation of the acceptability of the information that was presented by the licensee.

The licensee stated that the systems and components that are modelled in the IPE that are risk significant are classified QA safety significant (QASS). Systems are also classified QASS if any component in the system is classified QASS, and, if a system has been classified as QASS, all components in the system are also classified QASS. As a result of this process, no low ranked components modelled in the IPE support QASS systems.

After this discussion, the meeting ended.

Docket No. 50-416

Attachments:
1. List of Meeting Attendees
2. Responses to the Staff's Questions, Comments, and Preliminary Conclusions
3. Licensee's Expert Panel Guidance Document

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12/17/96

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ATTENDEES AT MEETING OF AUGUST 27, 1996

ON THE GRADED QUALITY ASSURANCE INITIATIVE

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G. Smith	EOI - Grand Gulf
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S. Black	NRC/NRR/HQMB
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E. Ford	NRC/NRR/HQMB
L. Campbell	NRC/NRR/HQMB
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J. Peralta	NRC/NRR/HQMB
M. Rubin	NRC/NRR/SPSB
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R. Isasia	NRC/NRR/SPSB
R. Woods	NRC/RES/PRAB
O. Gormley	NRC/RES/GSIB
J. DeBore	NRC Contractor (SEA)
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I. MacFarlane	Global Supply Group
M. Knapik	McGraw-Hill

where:
EOI = Entergy Operations, Inc.
NRC = Nuclear Regulatory Commission
NRR = Office of Nuclear Reactor Regulation
RES = Office of Nuclear Regulatory Research
SEA = Science & Engineering Associates
SAIC = Science Applications International Corporation

ATTACHMENT 1

MEETING OF AUGUST 27, 1996, ON GRADED QUALITY ASSURANCE INITIATIVE

RESPONSES TO THE STAFF'S QUESTIONS, COMMENTS, AND PRELIMINARY CONCLUSIONS

GRAND GULF NUCLEAR STATION, UNIT 1

DOCKET NO. 50-416

The following is a summary of the presentations made by Entergy Operations, Inc. (the licensee) in response to the staff's questions, comments, and preliminary conclusions on criteria for determining the safety significance of structures, systems and components (SSCs) in the staff's letter of July 15, 1996. The following will include the discussion held with the staff on each question, comment, or preliminary conclusion.

The words "report" and "document" used in this attachment refer to the licensee's document entitled "Criteria for Determining the Safety Significance of Plant Structures, Systems and Components for the Grand Gulf Graded Quality Assurance Program," dated October 11, 1995. There are many places where there is a reference to a table, page number, or criterion. These are references to the licensee's document.

Section 2 of the report discusses criteria for assigning the quality assurance (QA) safety significant (QASS) classification to systems (i.e., 6 criteria numbered 1 through 6) and Section 3 discusses criteria for assigning the QASS classification to components in QASS systems (i.e., 5 criteria numbered H1 through H5). Appendix A discusses the application of the maintenance rule, fire risk analysis, safety significant systems during outages, safety significant systems that mitigate radionuclide releases, and safety function success criteria. Appendix B discusses criteria to confirm that (1) systems are appropriately classified non-QASS (i.e., 6 criteria numbered a to f) and (2) non-QASS components should be classified non-QASS (i.e., 4 criteria numbered L1 to L4).

The probablistic risk assessment (PRA) used by the licensee for GGNS is the Individual Plant Examination (IPE) submitted by the licensee in response to Generic Letter 88-20 and is addressed in the staff's letter of March 7, 1996.

The responses below apply only to the Grand Gulf Nuclear station, Unit 1 (GGNS).

1. The term "QA safety significant (QASS)," as used throughout the report, needs to be defined.

On pages 2 and 3 of the report, it is stated that the term QASS refers to a combination of deterministic and probablistic criteria. Section 2 is the criteria for assigning QASS classifications to plant systems, and Section 3 is the criteria for assigning QASS classifications to components in QASS systems. The criteria in the report is used to assign structures, systems, and components (SSCs) to one of following two QASS classifications: (1) QASS SSCs or (2) Non-QASS SSCs.

2. Clarify the statement: "The *non-QASS* label does not remove any other design requirements" on page 3.

The licensee stated that the phrase "any other" can be deleted from the above sentence. Graded QA (GQA or graded QA) applies only to the requirements and commitments under Appendix B to 10 CFR Part 50. Requirements from other regulations can not be changed by graded QA; they must be changed using the appropriate change mechanism specified in the regulations.

3. Of those "Non-QASS Systems" shown on Figure 2-1, page 4, what percentage are safety-related per regulatory requirements?

The licensee stated that the systems are listed on pages 14 to 16, Table 4-1, of the report. Of the 42 systems, two are pseudo-systems (i.e., systems Bxx, Reactor Coolant Pressure Boundary and Containment Penetration Piping, and Mxx, Containment Isolation). Of the remaining 40 systems, 34 systems (85%) contain safety-related components and six systems (15%, i.e., containment, drywell/suppression pool/upper containment pool, service water radial well, fire detection, 6.9 Kv transformers, and 500 Kv circuit breakers) do not contain safety-related components. Also, of the 40 remaining systems, 31 systems (77%) are designated as "QASS" systems and nine systems (23%) are "Non-QASS" systems.

4. There seems to be an implicit assumption in the document that GQA means reduced QA. Does GGNS agree that the ranking system should allow for the possibility of QA requirements that exceed those now applied to "safety-related" items? Of course, there may not be any "safety-related" equipment for which it is reasonable to increase QA beyond present levels, but the possibility should not be excluded a priori by the ranking system.

The licensee stated that the report is silent on the QA requirements applied to SSCs and whether the QA requirements increases or decreases. The report is focused on the criteria which determines whether the SSC is safety significant and this could result in applying QA requirements in excess of current requirements, that is the application of QA requirements for non-safety related components. The licensee also stated that it could also result in the opposite effect of applying no QA requirements to safety-related components; it would depend on the safety significance of the components. The licensee stated that approximately 550 non-safety-significant components were classified QASS, and that about 10,000 (out of a total of 20,000) safety-related components were classified as non-QASS.

5. How does Grand Gulf intend on ranking passive items like pipes, fittings, supports, etc.

The licensee stated that this would be addressed as part of the discussion on item number 39.

6. The approach used for QA ranking focuses on the functions of equipment and on the consequences of failure to perform a design function. Before reducing QA requirements for any equipment, it is necessary to consider all failure modes, any secondary or consequential failures, and all common-cause failures. Has GGNS considered an analysis of the consequences of all failure modes, such as might be documented by a failure modes and effects analysis (FMEA) before proposing equipment for reduced QA?

The licensee stated that the approach used for QA ranking does not focus in this manner, but that it goes beyond the design basis. The approach would focus this way if it was only deterministic and based on the Updated Final Safety Analysis Report (UFSAR). Because the approach is based on the IPE, the approach takes into account the issues identified in the second and third sentence of the question. The IPE does a failure analysis which is essentially that of an FMEA. Each SSC is properly considered in the IPE and, therefore, it was not necessary to go further.

7. Grand Gulf's safety significance determination process is based on a qualitative extension and refinement of initial system and SSC importance as determined by the GGNS probablistic safety assessment (PSA). Please explain by what process is the PSA considered to have been validated for purposes of application to GQA?

The licensee explained that the GGNS PSA is the IPE conducted to meet Generic Letter 88-20. The IPE was based on the methodology used in NUREG-1150 by the staff and was validated by the following methods: (1) an internal review process during the development of the IPE, (2) a subsequent comparison with other BWR-6 Mark III plants, and (3) while performing the system ranking process during the implementation of the GQA effort.

8. The application of Graded QA will change some SSC reliabilities and availabilities. How does [the licensee] plan on insuring that non-linear effects due to the aggregate change from reducing QA controls on all low ranked SSC does not result in an unanticipated risk increase [for GGNS]?

The licensee stated that the systems and components that are modelled in the IPE that are risk significant are classified QASS. Systems are also classified QASS if any component in the system is classified QASS, and, if a system has been classified as QASS, all components in the system are also classified QASS. As a result of this process, no low ranked components modelled in the IPE support QASS systems. The licensee further stated that other low ranked components are either not modelled in the IPE or do not support a modelled component, and reducing the QA controls on low ranked components will not result in any quantifiable increase in risk.

9. Is the technical analysis that shows that the plant can tolerate a loss of engineered safety feature (ESF) Electrical Switchgear and Battery Room Ventilation function for up to 24 hours without affecting risk (as stated on Page 47) within the design bases for GGNS and thus supported by a staff safety evaluation report (SER)?

9. continued.

The licensee stated that there is no SER for the situation described in the question because that situation is not within the design basis for GGNS. The statement in the technical analysis is based on a realistic analysis that was performed for the IPE and showed that the room temperatures did not exceed values which would realistically be expected to cause equipment failure.

10. What were the bases for concluding, on Table B-4, Page 47, that System Z77 (Emergency Switchgear & Battery Rooms Ventilation) has "a Potential Role in Risk Management, but with a Very Low Failure Probability"?

The licensee stated that the basis for the statement in the question is the IPE assumption that ventilation was not required for those rooms for at least 24 hours. This is consistent with assumptions about GGNS in NUREG/CR-4550 and NUREG/CR-6143 (Vol. 2, Part 1, page 8-53).

11. Criterion 7 identifies systems that are considered risk significant by the collective judgement of the expert panel.

    The report provides no details concerning the deliberative process of the expert panel. Therefore, without additional information, the staff cannot comment on the rigor of the expert panel process.

The licensee stated that the document was intended to describe the criteria to be used and was not intended to document the deliberate process of the expert panel. Also, the licensee believed that it is inappropriate to imply that the expert panel process lacked rigor when the staff attended a meeting of the expert panel held in July 1995 and witnessed their deliberative process. It should also be recognized that at some point the expert panel will use their judgement.

12. [On] Page 4: The flow chart (Figure 2-1) depicts that one system was added due to expert panel judgement, yet page 10 lists two systems added by the expert panel. Please reconcile this.

The licensee stated that the panel only added System Z51, Control Room HVAC, to the QASS list. This is the one system for Figure 2-1. The additional system listed in Table 2-7, System E61 Combustible Gas Control, is in error. System E61, which includes the hydrogen igniters, was placed on the QASS list because of QASS Criterion 3 and is included in Table 2-3.

See Table 4-1 on pages 14 and 16. System Z51 was placed on the QASS list through the "Other QASS" column, the expert panel; however, System E61 was placed on the list because of Criterion 3. The "Other QASS" judgement was incidental.

13. [On] Page 4/10: For the one or two systems added by expert panel judgment, are there any deterministic criteria that could be extrapolated from that decision to add to the flow chart on page 4? In other words, the existing six criteria were not sufficient to delineate all of the QASS systems. Can the expert panel decision be evaluated to ascertain what criteria could be added to the flow chart (Figure 21) to envelop the systems that were added so that when the criteria are applied at another site, similar categorizations would result?

The licensee stated that there are no deterministic criteria that could be extrapolated from the expert panel's judgement to add System Z51 to the QASS list. In following up on Question 11, the licensee further stated that it is not fair to imply that by the panel using their technical judgement to add another system to the list that something is wrong in the six criterion. The panel developed the six criterion; however, it should be recognized that at some point the expert panel may have to fall back on their judgement and the "Other QASS" measure allows for this. This process can not be reduced to a simple cookbook approach. It should be remembered that this measure is not used to remove an item from the QASS list, but to add it to the list.

14. Give GGNS's view on whether or not a concern on the part of any one expert should be sufficient to prevent the categorization of equipment as non-QASS until further deliberations are carried out to address that expert's concern.

The licensee stated that no single expert panel member can prevent the application of the six criterion to add a system to the QASS list. The licensee believes these criteria are the most important part of the ranking process. Having applied the criteria, the other remaining factor is the panel discussion to determine if their collective judgement should add a system not meeting the criteria to the QASS list. This would be a consensus judgement by majority rule. Therefore, a judgement by a majority of the panel would be necessary to decide that a system is non-QASS.

15. The document should provide more information about the use of expert panels, including at least answers to the following questions:

    a) What qualifications are required of panel members?

    b) How is diversity of expertise assured?

    c) What guidelines are provided to a panel to clarify the distinction between QASS and non-QASS?

    d) Were supporting data, such as PRA/IPE documentation, is provided to panel members?

    e) What process is used to arrive at the panel's recommendations?

    f) Are measures taken to prevent undue influence by dominant personalities of panel members?

The licensee again stated that the purpose of its document was not to explain how an expert panel works, but to document the technical criteria used by the panel to determine what systems are QASS. The licensee handed out its expert panel guidance document. This is Attachment 3 to the meeting summary.

16. Completeness of Component-Level Criteria: The document does not provide a technical explanation for the inclusion or exclusion of any criterion, nor does it provide any technical basis for the adequacy of the set of criteria. The technical basis for the choice of the particular set of component-level criteria needs to be provided.

The licensee stated that pages 11 and 12 of the document provides a technical explanation for each criterion. The licensee further stated that the one basis for all the component-level criteria is that the criteria will identify components that have a measurable impact on risk at the plant. To have a measurable impact, an item must be in a QASS system in the IPE or have some direct relationship to a QASS item in the IPE. In addition to the IPE, other risk studies were reviewed (i.e., fire protection, shutdown risk, and IPE for external events).

17. Components in Non-QASS Systems: How is the procedure for classifying a system as non-QASS adequate to conclude that a failure of a component in that system would not adversely impact the functioning of another system?

The licensee stated that this question was the same as question 2 above. Component failures that lead to these types of impacts on the functionality of another system are covered under other regulations, requirements, or commitments which exist and must be complied with independent of the Graded QA ranking.

18. Based on the information provided, we could not conclude that the GGNS method for classify QASS components was reasonable. We need additional information including representative results that are obtained after applying these component classification criteria. We reviewed the criteria for determining whether components in a QASS system should be classified as QASS and questioned, or noted, the following:

    a) The rigor and review associated with classifying a component is significantly less than associated with classifying a system. Numerical criteria are not used, risk is considered in a qualitative, not [a] quantitative manner, and an expert panel is not used (one person (an engineer familiar with the PSA) can essentially make the determination for Criterion H1 and H2). Is this an accurate interpretation?

    b) For Criterion H2, it is not clear that an engineer familiar with the PSA has the appropriate experience and knowledge to determine components that are needed to support components modeled in the PSA.

c) Criterion H4 concerns components that support operator actions for previously determined QASS systems. As with Criterion 6 of the system criteria, we recommend that all operator actions that are modeled in the PRA be evaluated regardless of whether the actions are associated with a QASS designated system. What is the basis for the conclusion that all operator actions concerning non-QASS systems are unimportant from a risk perspective?

d) Criterion H5 uses the term "risk significant function." GGNS appears to define a term that is unclear. The criteria states: "If a component is not modeled in the PSA, but is required to perform a risk significant function in other plant risk studies..." We concluded that if a component is important in any other plant risk study, the fact that it is, or is not, modeled in the PSA has no relevance for this criterion.

The licensee stated that it has made available, to the staff during meetings, copies of the system component lists which include the results of component level reviews. For the separate items above, the licensee provided the following information:

a) The licensee disagreed with the staff's interpretation. The rigor associated with component-level classification exceeds that done at the system level. Conservative criteria are applied to ensure that more QASS components will be identified than would occur using a PRA approach. PRA analysts apply Criterion H1 to match system components with basic events. System engineers are needed for the remaining criterion and will be trained in using the risk studies and the risk-ranking criteria in the document. After their initial determination, design engineering will do a check with respect to the criterion.

b) The licensee agreed with the comment and stated that the system engineers will apply Criterion H2 through H5.

c) The licensee agreed with the comment for application to procedures, but disagreed with the application to systems and components. Operator action involves manipulating components and systems, and if the components and systems are not important then the operator actions are also not important.

d) The licensee agreed that whether or not a component is modeled in the IPE is relevant to Criterion H5. In order for a component to be considered for Criterion 5, the engineer would have determined that the component is not directly or indirectly modeled in the IPE (i.e., Criterion H1 and H2). Criterion H5 brings into consideration the other plant risk studies.

19. We reviewed the confirming criteria in Appendix B.2 and concluded that, considering the concerns with the classification criteria, the validity of these confirming criteria cannot be determined. Confirming criteria

19. Continued

that are based on lack of PSA detail or accepting failures that are only "small flow diversions," will require additional justification and clarification from GGNS. Confirming criteria based on a defacto determination that a component is "highly reliable" are not considered by the staff to be acceptable within the current risk informed framework and are more fully discussed in Question 21.

In Section B.1 of Appendix B on confirming criteria, it states that the confirming criteria in the appendix are used to confirm a system is Non-QASS after concluding the system does not meet the 6 criteria in Section 2 of the document.

The licensee stated that the confirming criteria are a "sanity" check, or second look, to evaluate that a system is not a QASS system. They represent a best guess list of reasons why a system or component would have little or no safety importance. The confirming criteria are a secondary look and do not need to be complete; the primary evaluation is provided by the 6 criteria which are used to determine whether a component or system to be QASS (i.e., the 6 criteria) and this must be complete.

20. We reviewed the confirming criteria in Appendix B for non-QASS systems and determined that, in general, the criteria were reasonable.

The licensee agreed with the statement by the staff.

21. Confirming criteria (d) and (e) concern systems whose failure probability is considered "very low" or "too weak to quantify." The staff's current position is that there is a certain level of safety significance best measured by the consequence of failure, such that systems or SSCs above this level should be categorized as "high" regardless of their assumed reliability. This position is reflected in GGNS's own Criteria 4 which explicitly includes highly reliable yet highly risk significant fission product barriers as "high" safety significant. A trial measure of RAW > 10 for components is under consideration. Please provide your thoughts on this criterion as well as any suggestion you may have on a system level criterion.

The licensee stated that the confirming criteria can not make a system low safety significant. The confirming criteria is a check that the non-QASS classification has been properly applied. If the system or component is risk significant in the IPE, or any other plant risk study, then it will have the QASS classification per Criterion H5, of the criteria for assigning QASS classifications to components in QASS systems regardless of the numerical importance of the measure valves.

22. We noted that plant annunciators were considered to have a low failure probability, did not meet the criteria for QASS, and, therefore, were considered non-QASS. Without the benefit of additional details concerning the deliberations of the expert panel, it is unclear why plant

22. Continued.

annunciators are considered non-QASS while control room heating, ventilation, and air conditioning (HVAC) is considered QASS. Both these systems have importance from a human performance perspective. What was the basis for these classifications?

The licensee stated that the annunciators did not meet any of the "H" criteria (i.e., criteria for assigning QASS classifications to components in QASS systems). Annunciators are not associated with an operator action. They were determined to be of low safety significance because other instrumentation is relied upon by the operators and the annunciators are not associated with an operator action that was modeled in the IPE. The HVAC system was classified as QASS, by qualitative judgement through the "other QASS" considerations shown in Table 4-1, because it has applications in many accidents.

23. B1.3, "Confirming Criterion (C)" states: If a system is not modeled in the PSA and does not meet the Maintenance Rule's screening criteria for risk significance, and meets no other expert panel test for safety significance, then it can be classified as non-QASS." What criterion is used for the "expert panel test for safety significance"?

The staff stated that this question has been addressed in the previous discussions.

24. B1.6, "Confirming Criterion (f)" states: If a system is either (i) a highly reliable structure, or (ii) a passive system with other requirements besides QA that are sufficient to assure reliability during accidents, then it can be classified as non-QASS.

Please provide examples of these non-QA requirements that assure reliability. Many of the items listed in Table B-6 are highly reliable because of the QA that was applied during their design, procurement, and construction of the item. Even though design requirements were applied, QA was still required to verify that the materials of construction, construction techniques, configuration, et cetera, were in accordance with the design requirements. If some of the items in Table B-6 were repaired, replaced, or modified, and the item was classified as non-QASS, would the same level of QA controls applied to the original design, procurement, manufacturing, and construction activities be applied to the repair, replacement, or modification of the item? If not because the item is now classified as non-QASS, then how will it be determined whether it will continue to be highly reliable? This criterion should not be applied to the repair, replacement, or modification of such items as those listed in Table B-6. We do not believe that high reliability provides adequate justification to classify a system as non-QASS.

The licensee stated that the staff is misinterpreting the use of confirming criterion (f). Confirming criteria is used to assure that a system should be non-QASS after it has been classified non-QASS by the failure of the system to

meet the H1 through H5 criteria. It is application of the H criteria, not the confirming criteria, that classifies the system as non-QASS. High reliability is not used as a justification for classifying a system non-QASS and does not appear in the H criteria.

25. Concerning Confirming Criterion (d) on page 47: Why is it acceptable to accept an analysis up to 24 hours only? What is the basis for selecting 24 hours, and why not a longer time span?

In confirming criterion (d), the following is stated: A reason for why a system's failure probability is low is because there is a technical analysis showing that the plant can tolerate a loss of the system's function for up to 24 hours without affecting risk. The licensee stated that 24 hours is the time frame usually used in PRA studies for allowing repairs and is a standard PRA assumption.

26. Concerning Confirming Criterion (d) on page 47: What are some examples of what "other requirements besides QA requirements" that are being considered? Does this refer to technical codes and/or surveillance testing?

The licensee stated that requirements other than Appendix B to 10 CFR Part 50 include the remaining Code of Federal Regulations, the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, the design codes and standards that are committed to in the Final Safety Analysis Report and not within the QA program, and any other licensee commitment that are not contained in the QA program.

27. Concerning Confirming Criteria (f) on page 48: Does this criteria duplicate criterion (d) in that credit is being taken for other design requirements beyond Appendix B [to 10 CFR Part 50] that assure the chance of equipment failure remains low?

The licensee agreed that the criterion overlap and there is some duplication. This is shown in the example tables given below each criterion in the report. Criterion (f) generally applies to passive systems including cables, raceways, and buildings. Criterion (d) generally applies to active systems, but where an analysis shows that the plant can tolerate the loss of the system for 24 hours.

28. Confirming Criteria for Non-QASS Systems: It is clear that a system would not be classified as non-QASS if it satisfied any of the Criteria [H]1 through [H]6. Given that it satisfies none of those criteria, it would also be evaluated against confirming Criteria a through f. What is not clear is whether a system must satisfy all of the confirming criteria, or just one confirming criterion, to be classified as non-QASS. The ranking document is not clear on this point.

The licensee stated that the system must fail all of the H criteria, the criteria for assigning QASS classification to components in QASS systems, to be classified non-QASS. To confirm that the system is non-QASS, the system must only meet one of the confirming criteria; however, it is not the application of the confirming criteria that makes the system Non-QASS. The staff stated that it is good practice that, if a system perhaps falls through the application of the H criteria and misjudged a non-QASS system, this judgement will be reconsidered through the use of the confirming criteria.

29. B.2 "Confirming Criteria for Non-QASS Components" states: "The criteria below is used to confirm a component as non-QASS. These criteria are designed for use only after concluding that a component meets none of the criteria in Section 3.1 (except for the "catch all" criteria described in Section 3.1.3)."

    There is no Section 3.1.3. Also, what is the "catch all" criteria and is Criterion H3 the "catch all" criterion? This is confusing because it permits a method to classify an item as non-QASS without guidance to the user. Please provide clarifying information.

The licensee stated that the reference to Section 3.1.3 is a typographical error. The reference should be to Section 3.3 which defines criterion H3. The report states that criterion H3 means that Grand Gulf will continue to classify components as QASS until a specific basis is established to classify components as non-QASS. Criterion H3 is a default criterion because, if the reviewer has any doubts about the components, the component should be classified QASS under this criterion. This criterion would be the default classification for any component, when the reviewer is uncertain in reaching a conclusion with respect to the other H criteria.

30. Please confirm that if, using Section 3, "Criteria for Assigning QASS Classifications to Components in QASS Systems," a component is classified as QASS, one cannot use the Criteria in Appendix B of the document to reclassify this item as Non-QASS.

The licensee stated that this is correct because the confirming criteria in Appendix B is used only to confirm if a system that is classified non-QASS using the criteria in Section 3 is appropriately classified as non-QASS.

31. Criterion H2, Supports Component Modeled in PSA: This criterion is reasonable if it is changed to "needed to support another component or supercomponent identified by Criterion H1." What are your staff's views on the change to the criterion?

The licensee agreed with the staff, but stated that it believed that this is what they stated in their own words.

32. Confirming Criteria for Non-QASS Components: It is clear that a component would not be classified as non-QASS if it satisfied any of the Criteria H1, H2, H4, or H5. Given that it satisfies none of those

criteria, it would also be evaluated against Confirming Criteria L1 through L4. As with Item 29 [above] on Non-QASS Systems, it is not clear whether a component must satisfy all of the confirming criteria, or just one confirming criterion, to be classified as non-QASS. Does GGNS intend to revise the document to clarify whether a non-QASS component must meet all of the confirming criteria, or just one?

The licensee stated that a component is classified "non-QASS" by not meeting the H criteria. The confirming criteria is simply a check that the non-QASS classification is correct and, in this check, the component must only meet one of the confirming criteria. The confirming criteria is to confirm the non-QASS classification is correct. If there is to be a revision to the report, it would be to delete Appendix B ("Confirming Criteria for Non-QASS Systems") because the use of confirming criteria appears to confuse the staff.

33. Concerning Criterion H5 (performs risk-significant function for IPEEE [individual plant examination - external events] or shutdown): This is an appropriately conservative treatment of components for which no numerical measure of risk significance is available.

The licensee stated that it agreed with the statement made by the staff; however, in some cases, there are numerical measure of the risk (e.g., fire and shutdown PRA). The licensee, at this time, has chosen not to employ numerical measures from the fire and shutdown PRA (See also Item 38 below).

34. Does the statement of the first paragraph on page 5, "Although Figure 2-1 suggests a sequential process, it is important to apply each criterion [1 through 6] to each plant system," contradict Footnote 1 on Page 10 [which states that "This criterion {Criterion 6} should be applied after Criteria 1-5. It applies only to the non-QASS systems remaining."]?

The licensee stated that the footnote does not contradict the statement that all of the criteria is to be applied to all of the systems, as shown in Table 4-1 on page 14 of the report which shows each criterion that a system met. The footnote emphasizes the progression shown in Figure 2-1 where Criterion 6 is applied after a system has not meet any of the 5 previous criterion. Criteria 5 and 6 do logically follow the previous 4 criteria.

35. Explain how Criterion 5 (as described on pages 8 and 9) "establishes a minimum QA requirement for each safety function."

The licensee stated that Criterion 5 establishes a minimum QA requirement for each safety function by assuring that at least one QASS system for each safety function in that Criterion 5 "identifies a minimum acceptable complement of systems needed to perform the safety functions that prevent core damage." The safety functions are modeled in the IPE. Therefore, at least one system will have the full Appendix B requirements applied for each safety function.

36. Concerning Criteria H1, H2, H4, and H5 (on pages 11 and 12): Do they include the fire risk Level 2 PSA? Assuming Criterion H5 encompasses more than seismic and shutdown risk analyses, shouldn't this be clarified in the document?

The licensee stated that there is a fire risk level 1 PSA for GGNS, but not a fire risk level 2 PSA. The Criterion H5 includes other plant risk studies and it was written in general terms because there may be future risk studies completed for GGNS.

37. Does Criterion H3 (on page 11) mean that if one of the other 4 criteria cannot be used to designate something as LSSC that it will automatically remain QASS?

The licensee stated that the answer is yes. See the licensee's response for Item 29 above.

38. Page 6: Criterion 2 statements are inconsistent. The first sentence indicates the criterion is linked to "high numerical risk importance values" (for fire and shutdown only, however). Later on reference is made to qualitative measures of risk importance for seismic. Clarify the discussion on this criterion.

The licensee stated that Section 2.2 of the report states that numerical measures can be used for fire and shutdown PRAs; however, seismic analyses are qualitative (or deterministic) and do not have numerical measures. Both numerical measures and qualitative determination based on risk studies are approaches to risk significance.

39. Concerning [Section] B.2.4 "Criterion L4" on page 50:

    a) Define passive components.

    b) What examples are there of the "several reasons", other than QA requirements, that account for the "disparity in failure rates" between passive and active components?

    c) Would Class 1E cables and wiring be considered passive components?

    d) Discuss if this criterion could lead to the possibility of considering that the reactor pressure vessel (RPV) is a highly reliable component and can be classified as non-QASS because the industry has never had a vessel rupture?

The licensee stated that passive components are defined by the list of such components given on page 50. The differences in failure rates between passive and active components are the result of the following: (1) passive components have fewer failure modes, (2) based on industry data, failure modes involving an action occur up to 100 times more frequent than non-active types of

failures. Cables and wiring are passive components. The RPV is a passive component; however, it is a pseudo system in Table 4-1 (i.e., Bxx) and is classified QASS by Criterion H4 and can not be classified as non-QASS.

40. Concerning [Section] B.2.4, "Criterion L4" which states: "If a passive non-active component is considered highly reliable regardless of its QA status, then it can be classified as non-QASS (or [QASS])."

    Although these items are passive, the materials of construction, configuration, et cetera, need to meet design requirements. If these passive items are classified as non-QASS, then graded QA would be applied, and a graded commercial grade (CGI) dedication process would be applied. As a result, the level of assurance that these passive items would remain highly reliable would be reduced because the original QA controls that resulted in the passive item being highly reliable would be reduced. Applying a graded CGI dedication process to items classified as Non-QASS could result in significantly reducing the QA controls for the procurement of these passive items. Thus, discuss what is the basis for assuring the passive items remain highly reliable?

The licensee stated that the answer to this is tied to the response for the previous question. Criterion L4 is one of confirming criteria to confirm that a component is non-QASS; the confirming criteria, however, do not determine that the component is non-QASS. The H criteria in Section 3 of the report are applied to determine if a component should be classified as QASS.

41. Concerning Confirming Criterion (f) on page 48: Why is cable considered a passive item? Could this criterion be used to categorize other than Class 1 piping as non-QASS?

The licensee stated that the response is given to Items 39 and 40 above. The confirming criteria only confirms that a component is non-QASS; the confirming criteria, however, do not determine that the component is non-QASS. The H criteria in Section 3 of the report are applied to determine if a component should be classified as QASS.

42. [Section] B.2.3, "Criterion L3" on page 50 states: "If a component is in a flow path that could create only a small flow diversion, then it could be classified as non-QASS (or NSS)." Provide the engineering analysis that justifies the PSA assumption that flow diversions of less than 1/3 piping diameter are not detrimental to carrying out the system function.

The licensee stated that there is no specific engineering analysis for this assumption. It is a typical PRA assumption based on fact that a flow diversion of 1/3 piping diameter is equivalent to a diversion of about 10 percent of the piping flow. See also the licensee's response to Item 19 above.

43. Criterion 1 states: "If a system satisfies any numerical screening criteria from Grand Gulf's Maintenance Rule Program Position Statement the system is classified as QASS."

a) The Maintenance Rule risk ranking may be an acceptable starting point for determining risk importance for other applications. However, the staff recommends that the integrity of the Maintenance Rule risk ranking remain intact. That is, both the deliberations and the numerical criteria used in the Maintenance Rule risk ranking process should be evaluated and validated for the GQA risk ranking process. This criterion, as written, discards the Maintenance Rule expert panel deliberations. The basis for the reconciliation between the expert panel ranking and the results of the numerical risk ranking need to be addressed in a rigorous manner. For example, it may be important for the GQA expert panel to fully understand how the Maintenance Rule expert panel determined the risk ranking for the Turbine Building Cooling Water (TBCW) system, although it met all four numerical screening criteria, was not considered risk significant or why the Standby Liquid Control (SLC) system was considered risk significant when it met none of the numerical screening criteria. More specifically, these expert panel conclusions may imply that the PRA model, input and/or assumptions are incorrect. If the PRA is conservative in the treatment of the TBCW system, the concern would be the masking effects this conservatism would have on other systems like the Standby Service Water (SSW) system. Finally, the staff noted that the TBCW is ranked low and the instrument air system is ranked high. Discuss if this ranking is inconsistent with the IPE results that shows the loss of TBCW initiating event contributes almost twice as much more to core damage frequency (CDF) (1.3%) than does the loss of instrument air initiating event (0.7%)?

b) There are also a number of issues which suggest that the numerical importance measures do not provide a fully adequate quantification input to the expert panel. Lessons learned from various NRC studies and pilot applications show that the following are potentially important issues:

(1) Truncation limits: Results of various studies show that, for a CDF of approximately 1E-5 per year, a truncation limit in the range of 1E-11 to 1E-13 is required for stability in the ranking results. What truncation limit is used by GGNS?

(2) Level of modeling of initiating events: Detailed (component level) models for initiating events caused by the loss of support systems is important when ranking in the component level. Discuss how this has been accounted for.

(3) Dynamic versus static plant configurations: Discuss how the effects of the different plant configurations on component ranking have been evaluated. This might be important during periods where there is scheduled maintenance or rolling maintenance when pre-specified sets of components are brought down for maintenance for a pre-specified amount of time.

(4) Common cause failures: For those components for which CCF contributions are not included in the PRA models, and this exclusion is justified based on the historical and engineering evidence driven by current requirements, the CCF contribution may become significant under the proposed graded QA approach. Discuss this. Has a sensitivity study (or any other type of study) been conducted that could identify those components which can shift to a high category as a result of uncertainties in CCF rates?

(5) Multiple component considerations: In risk ranking, the structures, systems, and components (SSCs) are binned based on single event importances. For those components assigned in the low category, one needs to assure that the aggregate impact of multiple components is negligible. Does the multiple component importance measure identify which combination of SSCs might be risk significant, therefore requiring them to be shifted to a higher category?

(6) Modeling of recovery actions: The concern in this area stems from situations where very high success probabilities are assigned to sequences, therefore resulting in related components being risk insignificant. Furthermore, it is not desirable that the ranking of SSCs be impacted by recovery actions which are only modeled for limited scenarios. Therefore, discuss whether SSCs should be re-ranked without recovery actions?

c) Because of the limited information submitted, we were unable to make conclusions about the adequacy of the PRA for GGNS or analyze the distribution of risk contributors. In addition, we cannot conclude whether the actual cutoff levels (i.e., 90% or 99.9%) are appropriate without consideration of the dominant contributors to risk. Discuss this.

d) It is not clear whether the expert panel deliberated on whether the cutoff levels for the Maintenance Rule are acceptable for use in GQA. Moreover, we were not able to determine whether the effect of common-cause failures, the aggregate effect of relaxing QA requirements, the impact of the truncation limit, and uncertainties were appropriately considered in the risk ranking process (Comment (b) above).

The licensee stated that it set up separate expert panels for the application of the maintenance rule and GQA because the criteria and judgements for determining safety significant systems and components were different for the two applications. The maintenance rule criteria for risk significance is discussed on pages 18 through 23 of the report. Only one criterion (i.e., Criterion 1 of Section 2.1 of the report) for classifying a system QASS applies the results of the maintenance rule panel. The licensee did not see a problem with the two panels arriving at different results; the maintenance rule panel identified 24 risk significant systems and the GQA panel identified 42 such systems. The staff stated that it did not want the licensee to simply use the results of the maintenance rule in classifying components QASS and non-QASS, and the licensee stated that it did arrive at different results as shown in the report.

The licensee believed that the level of detail shown in Item b) was excessive. It stated that the staff's concerns should disappear if it is understood that the approach taken by the licensee does not rely on the numerical importance of measures in the IPE for GGNS. The licensee stated that all systems and components that are risk significant in the IPE are classified QASS. The expert panel also relied on its informed judgement that the impact on the plant risk is negligible.

For b)(1) through b)(6), the following responses were provided by the licensee:

(1): The truncation limit used for GGNS is at least as low as 1E-10 and may be lower. The licensee also stated that it does not have access to some of the studies referenced in the staff's questions and that these studies should be made available so that a more complete response could be provided.

(2): Numerical ranking is not done at the component level at GGNS, only at the system level. Fault trees were used.

(3): Plant risk measures will be averaged by the time of exposure and thus tend to yield the average values. The dynamic effect of plant configuration changes involving non-QASS, non-modelled (in the IPE) items can not be calculated.

(4): Existing corrective action programs at GGNS are sufficient to identify a recurring problem or an adverse trend, and low safety significant components are not modeled in the IPE.

(5): Multiple component considerations do not apply to GGNS because numerical ranking is not applied at the component level. All risk significant components and all components in QASS systems are classified QASS. Furthermore, control of aggregate risk changes will be supported by the implementation procedures and, for example, if nominally identical components are ranked as of high risk significance in some systems and

low in other systems, the failure of the component in the low-significant system will be evaluated as though the component had failed in the high-significant system.

(6): Operator recovery actions in the IPE should not be deleted and are handled by Criterion H4. They are reflect how the plant will be operated and are included in emergency operating procedures. It is not needed that SSCs be re-ranked without including recovery actions.

The licensee stated that it has had the IPE for GGNS available for several years and has requested that the staff to review the document in detail. The licensee further stated that the staff should not make the statements in (c) above until after it has reviewed the IPE in detail and what was contained in its report should be adequate for the staff's review.

The licensee further stated that there is sufficient conservatism at the system and component level not to need further quantification discussed in d) above. The expert panel did not deliberate on cutoff levels. The risk significant systems modelled in the IPE modeled systems are classified QASS.

44. Criterion 2 states: "If a system is found to be risk significant in any of Grand Gulf's risk studies (i.e., IPEEE and shutdown), the system is classified as QASS."

    a) We determined that Criterion 2 focusses mainly on the fire and shutdown risks and states that seismic risk was found to be insignificant. We also determined that, in addition to fires and seismic, high winds and tornadoes should be considered. We have concerns on the potential effects of non-QASS structures on QASS systems in the power block from the effects of these external events. Examples would include the issues discussed in [Information Notice] IN 93-53. Discuss how Confirming Criteria (b) in Section B.1.2 addresses this concern.

    b) The document stated that for seismic events, the Grand Gulf study used "a deterministic 'success path' method that evaluates plant safety functions that prevent core damage. As a result, the seismic evaluation found no new risk significant systems." We determined that more information is required to determine the validity of a technique that can interpret non-quantitative, deterministic analysis and lead to a conclusion that there are no new risk significant systems. Provide this information.

    c) In Appendix A.2, it appears that systems were ranked as QASS based on a qualitative assessment of the functions that would either mitigate a fire initiating event or prevent a more severe fire damage state. It is not apparent that plant systems were ranked based on high numerical risk importance values measured relative to the change in core damage as was stated in Section 2.2. If the entire PRA model was indeed not used for numerical ranking of fire

risk, then insights on systems for accident mitigation might not be obtained: (i.e., the initiating event frequencies and fire damage state frequencies used in the fire PRA are based on current QA standards. Since the fire PRA model already assumes current QA requirements, keeping the fire suppression and detection systems as QASS will not lower the initiating event frequencies. Therefore, if fire risk is significant when compared to the internal event initiator risk, the total overall CDF would change and the relative importances of systems needed for core damage mitigation might also be affected.) Discuss these statements.

d) In Appendix A.3, it appears that the determination of shutdown risk is based only on CDF. Arguments were made that the CDF from shutdown is 30 times less than the CDF from power operation. Address the risk from large early releases when taking into account the fact that the containment is more likely not to be isolated during shutdown modes.

The licensee stated, for a) and b) above, that the IPEEE for GGNS is for a site of low seismic and high wind activity. GGNS is in the lowest seismic risk category established by the IPEEE process. There have only been qualitative studies done and GGNS is in the lowest seismic risk category established by the IPEEE process. Seismic and high wind considerations were handled through the design basis reviews of GGNS to license the plant. The method used to identify a QASS system for each safety function should be sufficient to address the concerns.

For c), the licensee explained that the detection and fire suppression systems for the risk significant fire zones were classified QASS, that the fire water system was designated QASS as it is a mitigating system for core risk, and that the remote shutdown system was classified QASS because of its importance if there is a fire in the control room.

For d), the licensee stated that the staff's statement does not apply to GGNS because there is a complete correlation between CDF scenarios and large early release scenarios.

45. Concerning Criterion 2, Significant for IPEEE or Shutdown: The referenced appendix adequately explains the limits of the shutdown study and how the numerical measures were obtained and applied. However, there is no explanation of numerical measures from the fire risk analysis. Further, it is not clear how system P47 [Table 4-1] came to be classified as QASS. Why doesn't Appendix A.2 present the basis for numerical measures, the actual measures for each system, whether P47 is QASS because of its presence in a significant fire area, and whether any systems in significant fire areas are not QASS?

The licensee stated that System P47 is the service water radial well which provides water for the site. As shown in Table 4-1, this system is classified QASS because of Criterion 2. The system includes components that are important for the operation of the service water system which has risk significance for shutdown.

46. Concerning Criterion 3 which states: "If the system is risk significant for preventing large early radionuclide releases from core damage accidents, it is classified as QASS."

    a) The risk ranking methodology for this criterion ranks system importance relative to a base case. The importance of this base case is not clearly established and it is difficult to place in context the relative ranking of other systems or properly interpret what is meant by "relatively more important" or "relatively less important." Clarify the importance of the base case so that it may be better understood

    b) In the risk importance calculations, weighing factors were used for the various release categories for combined event tree (CET) sequences to approximate off-site public dose. We will need additional information on how these weighing factors are derived. Specifically, address the following: 1) how much more weight is given to the large early releases, and 2) are representative offsite consequences calculated based on site characteristics like population distribution and meteorology, or are generic input used?.

    c) In reviewing the results in Table A-4, the containment, the suppression pool cooling function, the suppression pool makeup function, and the containment sprays are ranked relatively low. Is this because the ranking is dominated by the core cooling systems which support both core damage prevention and containment cooling and heat removal? (The strength of the containment, by itself, will not result in this kind of ranking, since the IPE shows that 33% of all severe accidents will result in a containment breach of some kind.)

The licensee stated that for Item a) above the base case for GGNS is the IPE. The IPE is the realistic assessment of system performance given the current plant design and procedures.

For Item b), the licensee explained that the level 2 IPE for GGNS categorized the containment event trees (CETs) for releases into 10 release categories from early-low to late-high, in terms of the time of release (early or late) and magnitude of release (low, medium-low, medium, medium-high or high). The results of the base case and each of the sensitivity cases is expressed in terms of frequencies for each of the release categories. A weighing factor was used to combine the frequencies into a single release frequency. The weighing factors applied were the following: (1) an early release is twice as bad as a late release and (2) factors of 4, 5, 6, 8, and 10 for low, medium-low, medium, medium-high or high. For example, a late-low release is 20 percent as bad as an early-high release (i.e., 1x4 for late-low versus 2x10 for early-high, and 4/20 = 0.2 for the ratio late-low/early-high).

For Item c), the licensee stated that the ranking results from the relative importance of the SSCs modeled in the CETs using an importance factor. This factor is the weighted fission product release obtained by using the factors discussed for b) above and the frequencies for the various release categories.

47. Concerning Criterion 4, Primary Fission Product Barrier: It is appropriate that systems in the primary fission product barrier be designated QASS. The documentation of the Level 1 PSA should list any other component that was not modeled because the component is highly reliable. The document should state whether there are any other components that were not modeled in the Level 1 PRA because of assumed high reliability. If there are any such components, the document should state how their systems are classified.

This was not discussed in the meeting; however, the licensee provided this answer after the meeting:

> Level 1 PRAs do not include a list of highly reliable, unmodeled components. This is an inherent constraint of the PSA model-building process. PSA models evolve from the top down. Analysts add functions, systems, and components to the model that have a measurable impact on the results. The model is "done" when it has enough detail to answer questions about dominant risk contributors. The Graded QA process considers both a component's reliability and its function (like providing a fission product barrier). A list of highly reliable unmodeled components is of little valve to the process unless it also discriminates among those components with important functions. Grand Gulf's confirming criteria (See Question 19) produced a list of highly reliable, unmodeled components (for systems with risk significant functions). These are items that satisfy Criterion L4.

48. Criterion 4 states: "If a fission product barrier is not explicitly modelled in the IPE because of its inherent high reliability, it is classified as QASS." We agree that this is an appropriate criterion. Although it should not affect the results of applying the criteria, we recommend that the term "IPE" be replaced with "PSA".

This item was a statement by the staff and did not require a response from the licensee. The licensee, however, agreed with the statement.

49. Criterion 5 states: "Ensure that at least one system or set of systems necessary to complete each critical safety function is classified as QASS."

    a) The stated purpose of this criterion is to identify a minimum acceptable complement of systems needed to perform the safety functions that prevent core damage. The report further indicates that it is impractical for Grand Gulf to modify its PSA to make more detailed importance calculations. Instead, according to the report, this deterministic criterion serves as an alternative way of ensuring that QA changes do not reduce safety function reliability

to an unacceptable level. The purpose of this criterion is unclear. We conclude that the intent of this criterion appears to be similar to the intent of Criterion 4, that is, to identify important systems that are not modeled in detail or sufficiently in the PSA. In other words, this criterion is designed to compensate for systems that are modeled, but do not show up as important because of the modeled redundancy and/or diversity by ensuring at least one redundant or diverse system is QASS. As stated, the purpose seems to detract from the defense-in-depth philosophy. Explain the impact on the defense-in-depth philosophy and clarify the criterion's purpose.

b) We do not agree that this criterion is an alternative way of ensuring that QA changes do not reduce safety function reliability to an unacceptable level. We conclude that sensitivity studies looking at group components could be used to provide a more quantitative measure of the change in plant risk associated with QA changes. For those components assigned in the low category, one needs to assure that the aggregate impact of multiple component [failures] is negligible. Does GGNS agree that the multiple component importance measure should identify which combination of SSCs might be risk significant, therefore requiring them to be shifted to a higher category?

c) We agree that this criterion could minimize the potential for inter-system common cause failures which might be introduced by the decrease in QA requirements for groups of similar components. However, because components within QASS systems could be graded non-QASS, discuss what assurances exist that there is at least one success path which contains components associated with performing the QASS function that are all QASS.

The licensee stated for Item a) above that Criterion 5 was added for defense-in-depth to ensure that at least one safety system for each safety function is classified QASS. The criterion did not result because of any difficulty in developing importance measures for GQA.

For Item b), the licensee disagreed with the staff's statement. See the response to Item 53. The licensee intends to periodically evaluate the cumulative effect of the SSCs changes.

For Item c), the licensee stated that Criterion 5 and the H criteria (Section 3 of the report on the criteria for assigning QASS classification to components in QASS systems) ensures that important components are classified QASS. The intent of the criteria is to ensure that there is at least one success path which contains QASS components associated with performing the QASS. This assurance is provided by the criteria that all components modeled in the IPE that support a QASS function and those components which are required to support the IPE components must be classified QASS. At least one success path for each safety function and all of the safety functions are modeled in the IPE.

50. Criterion 6 states: "If instrumentation or actuation equipment in remaining non-QASS systems is necessary for the operator to perform an operator action modeled in a QASS system, then ensure that at least one system or set of systems (sufficient to support the actions) is classified as QASS."

    The report states that actions associated with QASS systems are potentially risk significant and implies that actions associated with non-QASS systems are not risk significant unless the system is needed to support a QASS operator action. We recommend that all operator actions that are modeled in the PRA be evaluated regardless of the whether the actions are associated with a QASS system identified by applying the previous 5 criteria. Discuss why this criterion should not be revised and applied independently, and not be dependent on the results of the other 5 criteria.

The licensee's response is the same as for Item 18(c).

51. Concerning Criterion H4, Support PSA-Modeled Operator Action for a QASS System: As mentioned previously, when operator action is required, failure probabilities for instrumentation or actuation may not be significant compared with the probability of operator error. Resources might better be spent in measures to reduce the probability of operator error than in improving an already insignificant failure probability. These components should be modeled in the PRA, which can provide an indication of their importance. GGNS should justify why components required to support PSA-modeled operator actions should not be added to the PSA, if not already present. Then these components should be evaluated for importance. If they are omitted from the PRA because their failure probabilities are known to be negligible in comparison to the human error probability, then they may be classified non-QASS. Discuss these statements.

The licensee stated that the risk ranking for GGNS was developed to support the classification of equipment either modeled or not modeled in the IPE, and not to select what should be modeled in the IPE.

52. Concerning Criterion 6, Operator Action Support: Is there any intent to revisit this criterion if the expert panel adds a system that requires an operator action?

The licensee stated that the answer was yes, this criterion would be revisited if a new system was added to the plant.

53. Establishment of GQA would result in a simultaneous change in the reliabilities of many components. Discuss if the effects of these changes cannot be evaluated individually, that they must be incorporated into a revised PRA, including a reevaluation of each failure that was screened out of previous PRAs, and reexamined for potential common-cause failures.

The licensee stated that it did not agree that the establishment of GQA would result in a simultaneous change in the reliabilities of many components. There may be some reduction in reliabilities in some components, but this will happen to components which are classified non-QASS and, therefore, are of low safety significance. The corrective action program will monitor plant design by investigating the cumulative safety effect of component failures and their effect on the plant.

54. Page 1 [of the report]: The statement that "many of these components have a negligible role in preventing core damage..." needs to have a statement that this is from a PRA perspective, not necessarily a deterministic viewpoint.

The licensee agreed with this statement by the staff.

55. Page 2 [of the report]: The statement that "These deterministic criteria are intended to have a conservative bias, and substitute for more elaborate probabilistic modeling" inaccurately describes the need to have deterministic criteria to supplement and compensate for PSA modeling issues.

The licensee stated that it disagreed with the statement by the staff. The licensee explained that it included a deterministic approach to the criteria for classifying a system or component QASS to avoid question on modeling in the IPE. The staff referred to SECY 95-265 in stating that the purpose of an expert panel is to substitute for uncertainties in the PRA process.

56. Page 11 [of the report]: The criteria for determining QASS systems includes several criteria that supplement criteria based on PSA risk screening. However, the component criteria are more directly linked to whether components are modeled in the PRA, support a component modeled in the PRA, or are needed to support an operator action modeled in the PRA. Discuss, if the PRA models only a small percentage of the SSCs, are these reasonable assumptions to make. It was already recognized at the system level that PRA limitations necessitate a broader set of criterion, this seems contradictory to the component level criteria. What about a criteria on fission barriers not modeled in PSA? What about a criterion on components needed to carry out safety functions? What about criterion on components needed to carry out safety significant operator actions not modeled in [the] PSA?

The licensee stated that the QASS criteria effectively apply to the component because all components in a QASS system are included unless they are not modeled in the IPE. The pseudo systems Bxx and Mxx in Table 4-1, summary of GGNS QASS systems, include all components the reactor coolant system and containment pressure boundaries, respectively, regardless of whether the systems are modeled in the IPE or not. The licensee explained that in effect a component level criteria for QASS is applied for these pseudo systems.

57. Candidates [on top of page 2 of the report]: It is not clear what is meant by "candidates" for reduced QA requirements. Are the Non-QASS components the candidates for reduced QA? Or are all of them to have reduced QA while the QASS components are only candidates? Clarify what is meant by "candidates."

The licensee stated that "candidates" refers to any safety-related system is a candidate for the non-QASS classification; however, it can also apply in that any non-safety-related system is a candidate for the QASS classification (i.e., if the system is risk significant). Therefore, a non-safety system could be raised to the higher QASS classification.

58. Page 1 [of the report]: The characterization that up to 70% of a replacement part's cost is attributable to QA "pedigree" is highly subjective. Provide a comparison of components that were used to derive this conclusion. Are the technical characteristics really the same?

The licensee discussed this characterization in general and did not provide any comparison of components that were used to derive this conclusion.

59. Page 18 [of the report]: There is a typo in section 9.2, 2nd line, the word "significant" should be "significance".

The licensee agreed with the statement by the staff.

Grand Gulf Nuclear Station

Graded Approach to Quality Assurance (Graded QA) Project

Expert Panel Guidance Document

1.0 Purpose

1.1 The purpose of this guidance document is to delineate the scope, organization, responsibilities, and administration of the Graded QA Expert Panel.

2.0 Objectives

2.1 Finalize the criteria utilized to define the listing of Quality Assurance safety significant systems for GGNS.

2.2 Finalize the component level grading criteria.

2.3 Review the preliminary listing of Graded QA safety significant systems specified for GGNS.

2.4 Review the application of component level criteria on a sampling basis (See Attachment 1).

2.5 Develop/Finalize the QA criteria to be applied to:

2.5.1 Non safety significant SSCs.

2.5.2 Safety significant (non-safety related) SSCs.

2.6 Document the rationale for the Expert Panel's decisions resulting from the above activities in accordance with the guidance of Sections 5.2.3 and 5.2.4.

2.7 Once the initial scope is complete, meet on an infrequent basis, as needed to monitor/review changes to the program, and ensure that the criteria has been appliied correctly.

3.0 Composition and Selection

Expert panel members are selected from GGNS departments based on the specific expertise required to satisfy the objectives outlined in Section 2.0. The Graded QA Expert Panel composition will be selected from the following plant organizations

3.1
- Operations
- Design Engineering
- System Engineering
- Quality Programs
- Nuclear Safety and Regulatory Affairs

4.0 Personnel Qualifications

4.1 Expert Panel members selected from the GGNS organizations specified in Section 3.0 should satisfy the following qualification requirements:

4.1.1 Expert Panel members should meet the qualifications established in ANSI N18.1-1971 "Selection and Training of Nuclear Power Plant Personnel".

4.1.2 Personnel selected to serve on the Graded QA Expert Panel should have substantive and recognized knowledge of the function(s) performed by the GGNS department being represented.

4.1.3 Expert Panel member qualifications should be documented by resume and maintained on file.

4.2 Expert Panel Member Indoctrination

4.2.1 Expert panel members are required to attend an indoctrination session where the meeting material contained in Reference 7.4 is presented.

5.0 Organization and Responsibilities

5.1 The Graded QA Expert Panel quorum consists of a majority of the panel members.

5.2 The Expert Panel Chairperson will be selected from the Design Engineering organization.

5.3 The Graded QA Project Secretary is responsible, under direction of the Expert Panel Chairperson for:

5.2.1 Initiating Expert Panel meetings.

5.2.2 Preparing Expert Panel meeting agendas and approving discussion of items presented that are not on the agenda.

5.2.3 Preparing, maintaining, and distributing meeting minutes and all applicable related documents resulting from Expert Panel meetings.

5.2.4 Ensuring that the minutes of the Expert Panel meetings reflect the discussions, determinations, and recommendations of the Expert Panel meetings. The basis for decisions made by the Expert Panel should be included in Expert Panel meeting minutes.

5.2.5 Making assignments to follow up unresolved issues raised by the Expert Panel members.

5.2.6 Maintaining the status of Expert Panel open items.

5.2.6 Requesting additional input from outside sources (e.g., Reference 4) on subject specific areas of discussion, as required and approved by the panel.

5.3 Expert Panel Members are responsible for:

5.3.1 Attending Expert Panel meetings

5.3.2 Focusing their reviews on the safety significance aspects of each item discussed, with particular emphasis on those aspects related to the member's primary area(s) of expertise.

5.3.3 Reviewing appropriate documentation (i.e., meeting minute drafts), upon request of the Chairperson to supplement accurate documentation of Expert Panel meetings.

6.0 Conduct of Expert Panel Business

6.1 Decision Concurrence

6.1.1 The method of concurrence with matters presented for discussion before the Expert Panel shall be consistent with References 7.1 and 7.2.

6.1.2 The basis for dissenting votes by Expert Panel members may be documented and published with the meeting minutes.

6.2 Conclusion of Expert Panel Activities

6.2.1 The Graded QA Project Secretary, under direction of the Expert Panel Chairperson ensures that all open items are resolved and documented.

6.2.2 The Graded QA Project Secretary, under direction of the Expert Panel Chairperson verifies that the deliverables to satisfy the objectives in Section 2.0 are complete, documented, and presented to the management sponsor.

7.0 References

7.1 NUMARC 93-01 "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants", May 1993

7.2 NUMARC 93-02 "A Report on the Verification and Validation of NUMARC 93-01, Draft Revision 2A, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants", May 1993.

7.3 Letter from James L. Milhoan, (USNRC) to Thomas Tipton (Nuclear Energy Institute), dated October 14, 1994 - NRC Review of the NEI Draft Graded QA Guidance Document.

7.4 Hand-out Material from the May 4, 1995 NRC/Entergy Meeting "Implementation of Graded QA"

Graded QA

Expert Panel Guidance Document

Attachment 1

QA Safety Significant System/Component Review Guidance

Guidance for Performing Graded QA Safety Significant System/Component Reviews

Overview:

The joint EPRI/Entergy Graded QA initiative, with GGNS as the pilot plant, has resulted in a preliminary listing of 38 Graded QA safety significant systems for GGNS. This listing of systems was developed based on a combination of results from implementation of the maintenance rule and a conservative approach of supplementing the MR risk significant systems list with those systems determined to be important to safety from a quality assurance standpoint based on system level criteria developed during the EPRI/Entergy project.

System Level Evaluations:

The responsibility for developing the final listing of Graded QA safety significant systems for GGNS is encompassed within the scope of the Graded QA Expert Panel (Reference Section 2.3). In addition to the initial EPRI/Entergy project basis used for developing the preliminary systems list, the panel is expected to apply their experience and expertise, their knowledge of system safety function, and PRA risk ranking methodology and results to identify these systems.

Component Evaluations:

Of the preliminary listing of 38 QA safety significant systems for GGNS, 24 have undergone extensive component level evaluations as part of the EPRI/Entergy project. The component level evaluations were performed to determine the safety significance of the individual components based on GGNS probabilistic and deterministic models and the system engineers' system-specific knowledge and experience.

The primary focus of the Expert Panel should be to 1) review the criteria used to determine the component safety significance categorizations, and 2) perform a limited review (i.e., spot check) of component categorizations.

Grand Gulf Nuclear Station

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2.7 Once the initial scope is complete, meet on an infrequent basis, as needed to monitor/review changes to the program, and ensure that the criteria has been appliied correctly.

3.0 Composition and Selection

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