March 12, 2001

LICENSEE: STP Nuclear Operating Company

FACILITY: South Texas Project, Units 1 and 2

SUBJECT: SUMMARY OF FEBRUARY 15 -16, 2001, MEETING WITH STP NUCLEAR OPERATING COMPANY TO DISCUSS DRAFT SAFETY EVALUATION OPEN ITEMS ON SOUTH TEXAS PROJECT, UNITS 1 AND 2, MULTIPART EXEMPTION FROM THE SPECIAL TREATMENT REQUIREMENTS

On February 15 and 16, 2001, the U.S. Nuclear Regulatory Commission (NRC) and STP Nuclear Operating Company (STPNOC) met in Rockville, Maryland, to discuss open items identified in the draft safety evaluation issued on November 15, 2000, related to STPNOC's request for exemption from special treatment requirements of 10 CFR Parts 21, 50, and 100. The purpose of the meeting was to facilitate communication between the NRC staff and the licensee to allow the effective resolution of the open (OI) and confirmatory items (CI) in the draft safety evaluation.

Enclosure 1 provides a list of attendees at the 2-day meeting. Enclosure 2 provides the meeting agenda. Enclosure 3 provides a copy of the position paper used by the NRC staff to discuss its position on the exemption request from the environmental qualification requirements of 10 CFR 50.49. Enclosure 4 provides a copy of the position paper used by the NRC staff to discuss its position on the exemption request from the qualification requirements of IEEE-279, "Criteria for Protection Systems for Nuclear Power Generating Stations," imposed by 10 CFR 50.55a(h). Enclosure 5 provides a copy of the position paper used by the NRC staff to discuss its position on the exemption request from the seismic requirements of 10 CFR Part 100, Appendix A, for safe shutdown and operating bases earthquakes. Enclosure 6 provides the NRC staff's handout used to facilitate the discussions on open item 3.5. An overview of the discussions conducted during the meeting is provided below:

The NRC staff stated that 5 of 18 items are closed without exception (OI 3.1, 3.2, 3.3, 7.1, and 13.1). With some minor edits to the licensee's proposed Final Safety Analysis Report (FSAR) section, the NRC staff stated that an additional 2 of the 18 items would be closed (OI 4.1 and CI 4.2). The licensee agreed to make the suggested edits. Also, with some minor followup, the staff indicated that CI 4.1 would likely be closed without the need for additional interaction.

Although originally planned for discussion during the meeting, OI 5.1 on controlling changes to the exemption implementation processes was not discussed as the NRC staff has not finalized its position.

Six of the remaining open items are still open with success paths developed to varying degrees of detail and agreement (OI 3.4, 3.5, 3.6, 4.2, 10.1, and 10.2). Details of the discussions on each open item are provided below:

OI 3.4 - Addressing Containment Integrity in Categorization:

The NRC staff's position regarding containment integrity is consistent with the guidance provided in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," in that, as a matter of defense-in-depth, the categorization process needs to account for the importance of systems used to mitigate challenges to containment integrity. The NRC staff proposed two methods by which this issue could be addressed by the licensee. First, as a measure of the aggregate importance of these systems, the licensee could conduct a probabilistic sensitivity study that considered a decrease in the reliability of components modeled in the probabilistic risk assessment (PRA) relied upon to mitigate challenges to containment integrity that are categorized as low safety significant (LSS). The results of the sensitivity study would show the changes to conditional containment failure probability as a measure of the aggregate impact. Alternatively, the licensee could perform an evaluation that demonstrated that the components have no impact on the capability of plant systems to maintain containment integrity.

The licensee agreed that it would consider the alternatives proposed by the NRC staff to resolve this issue. Should another sensitivity study be needed, the licensee indicated that it may be 6 to 7 weeks before the study could be completed. The licensee is evaluating how best to demonstrate that the role of containment as a barrier is not significantly degraded when components that support the prevention of late containment failure are moved to LSS category. The NRC staff needs to review the results of this evaluation.

OI 3.5 - Categorization of Passive Pressure Boundary Function: (see Enclosure 6)

The NRC staff's position on passive pressure boundary functions was that STPNOC's exemption categorization process is not sufficient to categorize this passive function and that the licensee should use the methodology for categorizing piping under the risk-informed inservice inspection (RI-ISI) relief request. This would apply to all American Society of Mechanical Engineers (ASME) Class 1, 2, and 3 components. In this approach, the NRC staff recognizes that it has expanded the scope of components for which relief would be provided under the RI-ISI Electric Power Research Institute (EPRI) methodology to include ASME components other than piping welds, and expanded the extent of the relief to include repair and replacement in addition to inspection activities. The staff position requires that the licensee categorize active functions (for SSCs such as pumps and valves with and active and a passive functions) using the exemption methodology and the passive function using the EPRI methodology, then apply the higher of the two to the final categorization of the component. The NRC staff's position applied only to the extent the licensee is seeking an exemption from the ISI and repair/replacement requirements of the ASME Code required by 10 CFR 50.55a(g).

For categorizing the passive pressure boundary function, STPNOC had agreed to apply the EPRI methodology, in addition to the exemption methodology, to Class 1 and 2

components, and had indicated for ASME Class 3 components it planned to use only the exemption methodology. The licensee's position is that the exemption methodology is sufficient to categorize the passive pressure boundary function. In support of its position, the licensee indicated that the results of its Individual Plant Evaluation (IPE) flooding analysis sufficiently address the spatial effects concerns. However, this analysis does not address specific piping degradation mechanisms, may not evaluate all pipes in a room (only the largest), and does not categorize using the importance measures (i.e., risk achievement worth and Fussel-Veseley) consistent with the licensee's proposal.

At the conclusion of the meeting, the NRC staff maintained its position; however, the staff agreed to reconsider the basis of the licensee's position and have further dialog with the licensee. In parallel, the licensee agreed to evaluate the NRC staff's position that the EPRI methodology should be applied to Class 3 components to categorize the passive pressure boundary function and that the final categorization of the components should be the higher of either the EPRI methodology or the exemption methodology. Additional interaction with the licensee is required to resolve this issue.

OI 3.6 - Use of General Notes in Categorization:

The NRC staff's position on general notes was to require the notes to be captured in the FSAR section on categorization. This is based on the potential to use general notes to categorize similar components. STPNOC clarified its intent to use general notes as a method to streamline its documentation for categorization of certain groups of components and not as another method for categorization. The NRC staff is evaluating STPNOC's proposal to include in the FSAR a brief description and the intent on the use of general notes. Preliminary assessment provided by the NRC staff is that it would be acceptable. However, the NRC staff indicated that this is a change in the proposal and needs to be discussed with NRC management. Should NRC management concur with this change, the licensee will need to provide a revised response to the open item and update the proposed FSAR section in order for this item to be closed.

OI 4.2 - Treatment Processes Described in the FSAR

The NRC staff generally found that the licensee had adequately documented the treatment processes in the proposed FSAR section with some limited exceptions. The focus of the NRC staff's comments was on requesting that the licensee document in the FSAR what the treatment processes do, rather than the specifics of how the processes will be accomplished. A cross cutting area that the NRC staff felt could be better documented in the FSAR related to the licensee's use of national consensus standards. The NRC staff's position is that to the extent that the licensee uses national consensus standards in the procurement, testing, maintenance, installation, training, etc. in its balance of plant programs, the licensee is expected to use those national consensus standards for treatment of LSS and nonrisk significant (NRS) safety-related structures, systems, and components (SSCs). Also, treatment issues (principally with the procurement process), and associated documentation in the FSAR, related to the use of vendor documentation, equivalency evaluations, engineering evaluations, engineering analyses, and testing was deferred to the resolution of open items 8.1, 11.1, and 18.1 (environmental qualification and seismic requirements). For the installation process, the NRC staff's position was that the licensee

needed to clarify in the FSAR that appropriate preservice and preoperational testing and/or evaluation needed to be performed to demonstrate design basis capability. In the area of maintenance, the NRC staff sought licensee clarification in the FSAR description that predictive maintenance is also performed as part of the treatment proposed for LSS/NRS safety-related SSCs. In the FSAR description of inspections, tests, and surveillances, the NRC staff sought clarification from the licensee that these processes provide data or information that allows the evaluation of operating characteristics sufficient to conclude that the component will function under design basis conditions until the next test. As described in the FSAR in the area of Management and Oversight, the licensee proposed that when measurement and test equipment (M&TE) is found to be in error or is defective, it would make a determination on the functionality of the high safety significant/medium safety significant (HSS/MSS) SSCs that were checked using this M&TE. The NRC staff's position is that in addition to HSS/MSS SSCs checked with that M&TE, the licensee should also make a determination on the functionality of safety-related LSS and NRS SSCs checked with that M&TE.

Overall, the licensee generally agreed to incorporate the NRC staff's comments into the proposed FSAR section on treatment processes. While the licensee generally agreed to incorporate the NRC staff's comments, in the area of inspections, tests, and surveillances, the licensee's interpretation of the NRC staff's comments led to considerable discussion on how the licensee would obtain the data or information sufficient to evaluate the operating characteristics of LSS and NRS SSCs. The NRC staff reaffirmed its position that the inspections, tests, or surveillances performed should be sufficient to conclude that the component will function under design basis conditions until the next time the component is subject to inspection, testing, or surveillance. The NRC staff, left the details of how inspections, tests, or surveillances are conducted to the discretion of the licensee with the understanding that whatever method the licensee chooses to use will provide confidence in the functionality of the component. In the discussion on this issue, STPNOC expressed concerns about the rigor of predictive maintenance expected by the NRC staff. Also, regarding M&TE, the licensee agreed with the NRC staff in principal on checking the functionality of LSS/NRS safety-related SSCs, but clarified its intent to consider the LSS/NRS equipment functional until it is found to be otherwise (versus, for HSS/MSS equipment where the licensee will consider the equipment nonfunctional until it is proven functional). The licensee is evaluating how to best incorporate the NRC staff's comments into the proposed FSAR section. Additional followup will be required with the licensee related to inspections, tests, and surveillance to fully resolve this open item.

OI 10.1 and 10.2 - Repair/Replacement and ISI of ASME Code Components:

For ASME Code Class 1 components, the licensee will continue to meet all requirements of ASME Code Section XI, and by reference the requirements of Section III. This continues to meet the requirements of 10 CFR 50.55a(g) and is therefore acceptable to the NRC staff. For ASME Code Class 2 and 3 components categorized as LSS or NRS, the licensee proposed three alternatives it would use for the repair and replacement. Under alternative 1, the licensee would continue to apply the technical requirements of the ASME Code, but would not necessary follow the administrative requirements. The NRC staff requested that the licensee clarify what administrative requirements would be excluded from this alternative. The staff will review the information submitted by the licensee to clarify this

issue, and if it is consistent with the staff's interpretation of "administrative requirements," the NRC staff would expect to find this alternative acceptable for LSS and NRS ASME Code Class 2 and 3 components. Under alternative 2, the licensee would repair or replace the components using an alternative nationally recognized consensus code, standard, or specification. The NRC staff had two areas of concern. First, the licensee needs to clarify whether the alternative code, standard, or specification will be followed in full (both technical and administrative requirements). The NRC staff's view is that the alternative code, standard, or specification should be followed completely, for both technical and administrative requirements. Second, should the alternative code, standard, or specification not contain provisions for obtaining fracture toughness or impact testing information, where the original construction code would have required this information as part of the design requirements for the component, the licensee will include this as a design requirement for replacement or repair activities. For the third alternative, the licensee proposed to allow the use of requirements from different codes, standards, or specifications (i.e., mixing requirements). Consistent with the NRC staff's position as stated in the draft safety evaluation, the NRC staff reaffirmed its position that this alternative is not acceptable.

Another area where the NRC staff suggested an approach with regards to exempting components from the ISI and repair/replacement requirements of 10 CFR 50.55a(g) was for components of nominal pipe size of one inch (NPS 1) or less. Currently, the ASME Code contains only limited requirements for both the repair/replacement and ISI of NPS 1 and smaller components. Hence, the NRC staff questioned whether these components could be excluded from the scope of the exemption request to simplify potential issues concerning their categorization. Also, the NRC staff indicated that periodic system pressure testing is needed to confirm that the system is fully intact and therefore sufficient margin is maintained.

The licensee agreed for alternative 1 to provide the NRC staff with clarification on the scope of ASME administrative requirements that would be excluded from the repair and replacement using this method. During the meeting, the licensee stated that its intention under alternative 2 was to apply only the technical requirements of the alternative code, standard, or specification. The basis provided for this position by STPNOC was that this approach was consistent with the approach used under alternative 1. Without a clear understanding of the nature of the administrative requirements of the alternative code, standard, or specification, the NRC staff was unable to conclude that this would be an acceptable approach. STPNOC indicated that it would reconsider its approach under alternative 2 and would provide a response to the concerns expressed by the NRC staff. While the NRC staff has consistently expressed its determination that alternative 3 is not acceptable, the licensee plans to pursue this alternative further and will provide the NRC staff with the basis, the limitations, and the need for using this alternative in a revised response to these open items. While STPNOC representatives generally agreed with the NRC staff's observations regarding the NPS 1 and smaller component issue, further discussion on the NRC staff's suggestion regarding the ASME code relief for components of one inch or less nominal pipe size may be needed.

While conceptually a success path has been identified for these open items, should the licensee continue to pursue alternative 3 or not agree to the NRC staff's position regarding fracture toughness or impact testing requirements, resolution of these items will require extensive interactions between the licensee and the NRC staff.

The last three open items remain unresolved pending additional discussion with the licensee (OI 8.1, 11.1, and 18.1) regarding seismic and environmental qualification requirements. An overview of the discussions on each of these open items is provided below:

OI 8.1 - Exemption to 10 CFR 50.49 Environmental Qualification Requirements:

In support of this meeting, the NRC staff prepared a position paper on the licensee's response to OI 8.1. This paper was made available at this meeting (see Enclosure 3). The licensee has proposed to rely on (1) vendor documentation, (2) using equivalency evaluations, (3) using engineering evaluations, (4) using engineering analysis, or (5) using commercial testing, or combination of these methods to provide confidence that replacement components will be capable of fulfilling safety-related functions (including seismic and environmental qualification requirements). To some extent the NRC staff found that each of these methods have merit. The fundamental issue raised by the NRC staff was that whatever method is used by the licensee it must be tied back to some sort of data that demonstrates the capability of the replacement component to survive the environmental conditions expected during design basis events. Section 50.49 of *Title 10 of the Code of Federal Regulations* (10 CFR) focuses on type test data or partial type test data with supporting analysis. The NRC staff's position is that there could be some relaxation on the source of the data used to demonstrate the components (either as a unit or its subcomponent parts) will function under design basis environmental conditions. Further, the NRC staff indicated that relaxation could be considered in the areas of documentation and in margins. The NRC staff believes that there are seven critical technical requirements in the regulation that cannot be relaxed without changing the design basis of the component.

The NRC staff expressed a concern about when STPNOC would perform its analysis for determining that LSS/NRS equipment remains capable of performing its safety functions at the end of its qualified life. In STPNOC's response to this open item, it indicated that this analysis would be performed after the equipment had exceeded its qualified life. The NRC staff's position is that this analysis should be done before the qualified life is exceeded. The licensee agreed that in practice this analysis would be performed as the component neared the end of its qualified life.

At the meeting, STPNOC expressed its concern that the approach being proposed by the NRC staff is no longer Option 2 as there is no relaxation from the environmental qualification requirements based on the safety significance of the functions that the equipment supports. Limited progress was made during the meeting on resolving this open item. Further discussions with the licensee will need to occur to resolve this issue.

OI 11.1 - Exemption from Qualification Requirements of IEEE 279:

The NRC staff stated that resolution of this open item would be driven by the resolution of open items 8.1 and 18.1. The NRC staff's position paper is provided in Enclosure 4. Should the NRC staff determine that these two open items are successfully resolved and it is appropriate to grant exemptions (either completely or partially) to 10 CFR 50.49 Environmental Qualification Requirements, and/or to 10 CFR Part 100, Appendix A, Seismic Requirements then the NRC staff would grant a conforming exemption to the requirements

of 10 CFR 50.55a(h) that imposes the qualification requirements of the Institute of Electrical and Electronic Engineers (IEEE) standard 279, "Criteria for Protection Systems for Nuclear Power Generating Stations." The licensee acknowledged the NRC staff's position and agreed that this was an appropriate method for resolving this issue.

OI 18.1 - Exemption 10 CFR Part 100, Appendix A, Seismic Requirements:

In support of this meeting, the NRC staff prepared a position paper on the licensee's response to OI 18.1. This position paper is included as Enclosure 5. The licensee has proposed to rely on (1) vendor documentation, (2) using equivalency evaluations, (3) using engineering evaluations, (4) using engineering analysis, or (5) using commercial testing, or combination of these methods to provide confidence that replacement components will be capable of fulfilling safety-related functions (including seismic and environmental qualification requirements). To some extent the NRC staff found that each of these methods have merit. One of the methods proposed by the licensee relied upon methodology developed by EPRI for evaluating seismic capabilities of components. The NRC staff informed STPNOC that it was still reviewing this methodology and the NRC staff agreed to a teleconference with STPNOC during the week of February 26, 2001, to provide STPNOC with feedback on its assessment of this process.

During the meeting, STPNOC indicated to the NRC staff that as part of its PRA it conducts fragility analyses to assess the risk impact of seismic events on SSCs performance. Additional dialogue with the licensee during the week of February 26, 2001, may resolve this issue.

At the end of the meeting, STPNOC made the following points to the NRC staff regarding its exemption request from the special treatment requirements of 10 CFR Parts 21, 50, and 100.

1. Seismic and environmental qualification requirements remain major issues to be resolved.

2. The exemption is no longer consistent with STPNOC's understanding of the intent of Option 2.

3. STPNOC is committed to working with the NRC staff to get the exemptions.

4. STPNOC sees a success path to resolve the NRC staff's issues with inservice inspection.

5. STPNOC thought that the issues associated with relief from inservice testing requirements were addressed previously, but it appears that more work is needed.

6. Change control for the exemption implementation processes is a significant concern to STPNOC (open item 5.1). STPNOC wants some implementation flexibility.

7. While progress is being made, the schedule for completion of the review of the exemptions and granting the exemptions may be an issue. When the NRC staff re-forecasts the schedule, it needs to be as timely as it can be.

8. STPNOC is confident that the exemptions can be granted.

9. STPNOC believes the NRC staff positions on assurance of functionality for LSS and NRS safety-related SSCs has paralyzed effort.

Finally, the licensee asked the NRC staff about reviewing the final safety evaluation before the NRC staff issues it and the associated exemptions. The NRC staff informed the licensee that, prior review by the licensee is not consistent with the NRC's normal process for exemptions. However, the safety evaluation will be made available to the public about two weeks before the NRC staff and the licensee meet with the Commission on the exemption request and that following the Commission meeting, the NRC staff will delay issuance of the final safety evaluation and the exemptions for two weeks to allow time for Commission comments. The NRC staff agreed to seek guidance from NRC management regarding additional opportunities for the licensee to review the safety evaluation before it is issued.

/RA/

John A. Nakoski, Senior Project Manager, Section 1
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Office of Nuclear Reactor Regulation

Docket Nos. 50-498 & 50-499

Enclosures:
1. List of Attendees
2. Meeting Agenda
3. Position Paper on 10 CFR 50.49
4. Position Paper on 10 CFR 50.55a(h)
5. Position Paper on 10 CFR Part 100
6. Open Item 3.5 Handout

cc w/encls: See next page

9. STPNOC believes the NRC staff positions on assurance of functionality for LSS and NRS safety-related SSCs has paralyzed effort.

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6. Open Item 3.5 Handout

cc w/encls: See next page

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Meeting Notice: ML010330364
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LIST OF ATTENDEES
FEBRUARY 15 - 16, 2001, MEETING BETWEEN NRC AND STPNOC
DRAFT SAFETY EVALUATION OPEN ITEMS

NAME	TITLE/POSITION	ORGANIZATION	2/15	2/16
Rich Barrett	Branch Chief	NRR/DSSA/SPSB	x	x
Jose A. Calvo	Branch Chief	NRR/DE/EEIB	x	x
Gene Imbro	Branch Chief	NRR/DE/EMEB	x	x
Stuart Richards	Project Director	NRR/DLPM/PDIV	x	x
David C. Fischer	Acting Section Chief	NRR/DE/EMEB	x	x
Bob Gramm	Section Chief	NRR/DLPM/PDIV-1	x	x
Kamal Manoly	Section Chief	NRR/DE/EMEB	x	
Cornelius Holden	Section Chief	NRR/DE/EEIB	x	x
Mark Rubin	Section Chief	NRR/DSSA/SPSB	x	x
Thomas Bergman	Regional Coordinator	NRC/EDO		x
Goutam Bagchi	Senior Level Advisor	NRR/DE	x	
Mike Cheok	Senior Risk Analyst	NRR/DSSA/SPSB		x
John Fair	Senior Mechanical Engineer	NRR/DE/EMEB	x	x
Hukam Garg	Senior Instrumentation Engineer	NRR/DE/EEIB	x	x
Donald Harrison	Risk Analyst	NRR/DSSA/SPSB	x	x
Ken Heck	Quality Assurance Engineer	NRR/DIPM/IQMB	x	
Samuel Lee	RIsk Analyst	NRR/DSSA/SPSB	x	x
Stewart Magruder	Senior Project Manager	NRR/DRIP/RGEB	x	
Eileen McKenna	Senior Project Manager	NRR/DRIP/RGEB	x	x
Matthew A. Mitchell	Mechanical Engineer	NRR/DE/EMCB	x	x
John Nakoski	Senior Project Manager	NRR/DLPM/PDIV-1	x	x
Bob Palla	Containment Systems Engineer	NRR/DSSA/SPSB	x	
Tim Reed	Senior Project Manager	NRR/DRIP/RGEB	x	x
Paul Shemanski	Senior Electrical Engineer	NRR/DE/EEIB	x	
Mohammad Shuabi	Project Manager	NRR/DLPM/PDIII-1	x	
Michael Snodderly	Containment Systems Engineer	NRR/DSSA/SPSB	x	
Ron Young	Plant Systems Engineer	NRR/DSSA/SPLB	x	x
Asimios Malliakos	Risk Analyst	RES/DRAA	x	x
Jit Vora	Mechanical Engineer	RES/DET/MEB	x	
Steve Frantz	STPNOC Legal Counsel	Morgan, Lewis, & Bockius	x	x
Rick Grantom	Manager, Risk Management	STPNOC	x	x
Scott Head	Manager, Licensing	STPNOC	x	x
Steve Thomas	Manager, Plant Design	STPNOC	x	x
Glen Schinzel	Project Manager, Exemption	STPNOC	x	x
Ralph Chackal	Engineer, Exemption	STPNOC	x	x
Adrian Heymer	Project Manager	NEI	x	x
Michael Knapik	Report	McGraw-Hill	x	
Jim Petro	Attorney	Winston & Strawn	x	
Deann Raleigh	Client Manager	LIS, Scientech	x	

AGENDA AND SCHEDULE

Thursday, February 15, 2001

Room O-10B4

8:00am - 8:30am	Meeting Opening and Closed Items (OIs 3.1, 3.2, 3.3, 13.1, and CI 4.2)
8:30am - 11:30am	Discussion on EQ and Seismic Issues (OI 8.1, 11.1, and 18.1)

11:30am - 12:30pm LUNCH

Room O-08B4

12:30pm - 1:30pm	Dicussion on OQAP (OI 7.1)
1:30pm - 2:30pm	Discussion on General Notes (OI 3.6)
2:30pm - 3:30pm	Discussion on Passive Pressure Boundary Function and categorization (OI 3.5)
3:30pm - 4:30pm	Discussion on Containment Integrity and categorization (OI 3.4)
4:30pm - 5:00pm	Wrapup thoughts on Categorization

Friday, February 16, 2001

Room O-07B4

8:00am - 9:00am	STPNOC feedback on staff position on Categorization
9:00am - 10:00am	Discussion on Change Control (OI 5.1)
10:00am - 11:00am	Discussion on Treatment of HSS/MSS SSCs (OI 4.1)
11:00am - 12:00pm	Discussion on ASME Repair/Replacement and ISI (OI 10.1/10.2)

12:00pm - 1:00pm LUNCH

1:00pm - 3:00pm Treatment Processes in FSAR and areas of Inconsistency (OI 4.2 and CI 4.1)

February 9, 2001

SOUTH TEXAS PLANT (STP) 10 CFR 50.49 EXEMPTION REQUEST

Introduction

The regulation at 10 CFR 50.49(b), defines the scope of electrical equipment important to safety that must be included under a program for qualifying equipment described in 10 CFR 50.49. Electric equipment important to safety covered by 10 CFR 50.49(b) includes (1) safety-related electric equipment, (2) non-safety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions (a) through (c) specified below, and (3) certain post-accident monitoring equipment. Safety-related electric equipment is that relied upon to remain functional during and following design-basis events to ensure (a) the integrity of the reactor coolant pressure boundary, (b) the capability to shut down the reactor and maintain it in a safe shutdown condition, or (c) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11 as applicable. Design-basis events are defined as conditions of normal operation, including anticipated operational occurrences, design-basis accidents, external events, and natural phenomena for which the plant must be designed to ensure functions (a) through (c) defined above.

10CFR 50.49 requires that each item of electric equipment important to safety must be qualified by one of the following methods:

(1) Testing an identical item of equipment under identical conditions or under similar conditions with a supporting analysis to show that the equipment to be qualified is acceptable.

(2) Testing a similar item of equipment with a supporting analysis to show that the equipment to be qualified is acceptable.

(3) Experience with identical or similar equipment under similar conditions with a supporting analysis to show that the equipment to be qualified is acceptable.

(4) Analysis in combination with partial type test data that supports the analytical assumptions and conclusions.

Exemption Requested

In its submittal, STP requested an exemption to exclude LSS and NRS components from the scope of electric equipment important to safety under 10 CFR 50.49(b) for the purposes of environmental qualification of electrical components. In its letter dated January 23, 2001, STP proposes to use one or more of the following methods to determine that LSS and NRS components can perform their safety-related functions under design basis environmental conditions:

Vendor Documentation - The performance characteristics for the item, as specified in vendor documentation (e.g., catalog information, certificate of conformance), satisfy STP's environmental requirements.

Equivalency Evaluation - An equivalency evaluation determines that the procured item is equivalent to the item being replaced (e.g., a like-for-like replacement).

Engineering Evaluation - An engineering evaluation compares the differences between the procured item and original item and determines that the procured item can perform its safety-related function under design basis environmental conditions.

Engineering Analysis - In cases involving design changes or substantial differences between the procured item and replacement item, an engineering analysis may be performed to determine that the procured item can perform its safety-related function under design basis environmental conditions.

Testing - If none of the above methods are sufficient, commercial testing would be performed on the component. Margins, documentation, and additional assurance specified in 10 CFR 50.49 would not be required in these tests, since the components are LSS and NRS and do not warrant this additional assurance.

Discussion

In its submittal, STP states that its categorization process ensures that the failures of safety-related LSS and NRS SSCs will not result in undue risk. STP states that functionality of safety-related LSS and NRS SSCs will be maintained through commercial practices similar to those used for balance-of-plant (BOP) SSCs. STP further states that commercial practices have proven adequate in ensuring high reliability and availability of BOP SSCs and that by definition, safety-related SSCs categorized as LSS and NRS do not affect the performance of any risk-significant function. Additionally, STP states that the functional requirements for the LSS and NRS SSCs will not be affected and these SSCs will be subject to the same design controls as those used for HSS and MSS safety-related SSCs. STP proposed that should the exemption be granted, (1) the qualification documentation and files specified in 10 CFR 50.49 would not be applicable to LSS and NRS components, (2) LSS and NRS electric equipment would not required to be maintained in a qualified condition pursuant to 10 CFR 50.49, (3) LSS and NRS electric equipment could be replaced with equipment that is not qualified pursuant to 10 CFR 50.49, (4) LSS and NRS components, as applicable under 10 CFR 50.49 would be designed to function in the installed environment, and (5) normal commercial and industrial design and procurement controls would be applied to LSS and NRS components to achieve the requirement that they are designed to function in the installed environment.

STP indicated that the underlying purpose of 10 CFR Part 50 (i.e., the rule) is to provide reasonable assurance that the facility will be operated safely and that there is adequate protection of public health and safety. STP indicates that the application of 10 CFR 50.49 equipment qualification requirements to LSS and NRS components is not necessary to achieve the underlying purpose of 10 CFR Part 50. Specifically, the 10 CFR 50.49 qualification requirements are currently applied to components (categorized LSS and NRS) that will not credibly cause loss of the safety-related system level function and will not have an adverse impact on plant risk. Thus, STP concluded it is not necessary to apply 10 CFR 50.49 qualification requirements to LSS or NRS components to achieve the underlying purpose of the rule.

The electric equipment qualification program in 10 CFR 50.49 requires that the following critical attributes must be included: (1) temperature and pressure, (2) humidity, (3) chemical effects, (4) radiation, (5) aging, (6) submergence, (7) synergistic effects, and (8) margins.

10 CFR 50.49 also requires that a record of qualification must be maintained in an auditable form for the entire period during which the item is installed to permit verification that the item is qualified for its application and meets its specified performance requirements when subjected to design basis conditions.

While items (1) through (7) above, could adversely affect component functionality and must be addressed, the staff has considered the remaining critical attribute margin and documentation to determine if some relaxation may be possible to maintain functionality albeit with lower confidence.

Evaluation

The staff has reviewed the licensee's submittal as supplemented by the January 23, 2001, letter and has the following comments on the summary of STP's proposed methods. STP proposes to use one or more of the following methods to determine that LSS and NRS components can perform their safety-related functions under design basis environmental conditions:

Vendor Documentation - -The performance characteristics for the item, as specified in vendor documentation (e.g., catalog information, certificate of conformance), satisfy STP's environmental requirements.

The staff evaluated the licensee's proposal on vendor documentation. In order to provide the minimum level of assurance of component functionality during design basis events, the catalog information must specify that the item can perform its function when subjected to the critical attributes set forth in 10 CFR 50.49(e)(1) through (7). If the vendor catalog does not contain all of the critical attributes, then the missing attributes must be included in the procurement specification. The vendor's acceptance of the procurement specification without exceptions will provide minimal assurance that the component performance requirements will be met during design basis conditions.

The staff notes that the critical attribute of margin and the requirement for documentation as stated in 10 CFR 50.49 would not be required.

Equivalency Evaluation - - An equivalency evaluation determines that the procured item is equivalent to the item being replaced (e.g., a like-for-like replacement).

The staff's experience with similarity analysis demonstrates that this type of evaluation is difficult to perform unless the component is identical. Once differences are identified it is difficult to determine, without reference to other data, that the equipment will be functional in a harsh environment. Industry experience in the application of 10 CFR 50.49 testing showed that small differences in design can have significant impact on the outcome of the test. For example, even minor differences in a seal could introduce new leakage paths that allow a harsh environment to invade a component and cause unacceptable leakage currents or grounds. For this reason, the staff notes that an equivalency evaluation must be limited to identical components. Where the components are not identical, an engineering evaluation would be necessary. The staff will confirm with STP what is meant by "like-for-like replacement."

Engineering Evaluation - - An engineering evaluation compares the differences between the procured item and original item and determines that the procured item can perform its safety-related function under design basis environmental conditions.

The staff evaluated the STP proposed engineering evaluation. An engineering evaluation needs to systematically identify the differences between a replacement component and the original component with respect to the design conditions which include the critical attributes set forth in 10 CFR 50.49(e)(1) through (7). The differences in material, size, shape, stressors, aging mechanisms, or function must not adversely affect performance of the safety function(s) in order for the component to remain functional as required. STP included a description of the types of evaluations for various environmental parameters. The environmental parameters STP will evaluate are identical to the environmental parameters listed in 10 CFR 50.49(e)(1) through (7). STP takes exception to applying margins and documentation, as required by 50.49 to LSS and NRS components, and that as necessary it would use commercial testing in lieu of qualification testing required by 10 CFR 50.49. The staff notes that the critical attribute of margin and requirement for documentation stated in 10 CFR 50.49 would not be required. These are evaluated below.

Engineering Analysis - - In cases involving design changes or substantial differences between the procured item and replacement item, an engineering analysis may be performed to determine that the procured item can perform its safety-related function under design basis environmental conditions.

Most electrical equipment required to function during design basis conditions is relatively complex and qualification experience has shown that although materials are selected and equipment carefully designed to survive design basis events, qualification testing has demonstrated that electrical equipment often responds and sometimes fails in unexpected ways due to small design changes or material changes. Therefore, it is not reasonable to assume that engineering analysis without some basis in test data (not necessarily limited to type test data) (i.e., analysis alone) can account for substantial differences between the procured item and replacement item to demonstrate functionality under design basis conditions. Engineering analysis in combination with test data (e.g., previous operating experience; empirical data (i.e., derived from or guided by experience or experiment), partial type test data if the component size, application, or other limitations preclude the use of a full type test) must be used to support the analytical assumptions/ calculations to demonstrate that the differences in design/materials would not impact the component's functionality when subjected to a design basis event. National consensus standard IEEE Std 323-1974 can be used as a guide to provide the minimum level of assurance of LSS or NRS component functionality when subjected to a design basis event. The staff will confirm with STP what test data will be used to support the analysis.

The staff notes that the critical attribute of margin and the requirement for documentation stated in 10 CFR 50.49 would not be required.

Testing - - If none of the above methods are sufficient, commercial testing would be performed on the component. Margins, documentation, and additional assurance specified in 10 CFR 50.49 would not be required in these tests, since the components are LSS and NRS and do not warrant this additional assurance.

The licensee has not provided the staff with any detailed information with regard to the attributes involved with commercial testing. The staff would find commercial testing acceptable if the testing lab qualification program is implemented in a manner that demonstrates that the component performance under test satisfies all of the qualification critical attributes as set forth in 10 CFR 50.49(e)(1) through (7). National consensus standard IEEE Std-323 1974 can be used as a guide to provide the minimum level of assurance of LSS and NRS component functionality during a design basis event. It should be noted that the critical attribute of margin

and the requirement for documentation stated in 10 CFR 50.49 would not be required. The testing must be accompanied with a supporting analysis to show that the component performance under test satisfies all of the critical attributes in cases where the differences are sufficient to preclude the procured item from performing its function under design basis conditions. Furthermore, the staff will confirm what STP's statement, "the additional assurance in 10 CFR 50.49" means.

Margins were required in 10 CFR 50.49 to account for unquantified uncertainty,such as the effects of production variations and inaccuracies in test instruments to provide a level of assurance that a component would still function under design basis conditions. Elimination of margins in the performance of testing is acceptable since the test would show that the component is capable of performing its required function, albeit with lower confidence when uncertainty margins are applied. The staff will confirm with STP what provisions will be used to ensure that the margins have not been reduced below a level that places in question the capability of LSS or NRS component to perform its function when subjected to design basis events.

STP has stated in Attachment 4 of the January 23, 2001, letter to NRC under STPEGS UFSAR 13.7, Section 13.7.3.3.2, Procurement Process, the following:

Documentation of the implementation of the above five STP proposed methods for qualification of components is maintained. Additionally, documentation is maintained to identify the preventive maintenance needed to preserve the capability of the procured component to perform its safety-related function under design basis environmental and seismic conditions for its expected life. The staff finds the proposed documentation acceptable. The staff will confirm with STP that any impact to the component as a result of changes to the service conditions will be taken into account to ensure that the expected life of the component remains valid.

STP indicated they would evaluate a LSS or NRS component for functionality only after it exceeded it's qualified life. This is contrary to 10 CFR 50.49 in that licensees must take action before a component reaches the end of its qualified to assure it is qualified. STP has not provided justification for allowing a component to exceed the parameters necessary to retain the qualification and therefore the functionality of a component. **Open Item:** STP needs to provide a method of evaluating LSS and NRS component functionality before (and not after) these components exceed their qualified life.

Conclusion

Subject to the satisfactory resolution of the confirmatory and open items and the acceptability of the clarifications requested, each of the five STP proposed methods would be acceptable to provide assurance of component functionality under design basis conditions. The basis for this conclusion is that the qualification process proposed by STP can be clarified to ensure that the critical attributes, except margin, required by 10 CFR 50.49 to demonstrate functionality are satisfied. The reduced level of assurance is manifested by reducing margins and requiring less stringent documentation. If he issues raised by the staff are satisfactorily resolved, granting a partial or full exemption to 10 CFR 50.49 may be appropriate.

STP Proposal

STP has proposed the following response to Open Item 11.1:
STP's basis for the exemption from the environmental qualification requirements in IEEE 279, as incorporated in 10 CFR 50.55a(h), is the same as its basis for the exemption from the environmental qualification requirements in 10 CFR 50.49. STP's response to Open Item 8.1 describes and provides a technical justification for STP's proposed methods for assuring that LSS and NRS components will be able to perform their functions under applicable design basis environmental conditions. That response also explains why STP needs the exemption from 10 CFR 50.49, and those reasons are equally applicable to the requested exemption from Section 4.4 of IEEE 279 (which requires use of test data to qualify equipment).

Regulation

Section 4.4 of IEEE 279 states that: "Type test data or reasonable engineering extrapolation based on test data shall be available to verify that protection system equipment shall meet, on a continuing basis, the performance requirements determined to be necessary for achieving the system requirements."

It should be noted that IEEE 279 is not a deterministic regulation and does not contain a minimum set of critical attributes that are necessary to demonstrate qualification for an item up to the end of its qualified life. As such, the licensee can describe a reasonable engineering approach to meet the requirements of IEEE 279. The detailed prescribed requirements to qualify the equipment are required by other regulations, such as 10 CFR 50.49 for environmental qualification and 10 CFR 100 for seismic qualification.

Staff Discussion

STP in their response to Open Item 11.1 regarding Section 4.4 of IEEE has requested exemption from the environmental qualification requirements, while Section 4.4 of IEEE 279 also covers seismic qualification requirements. STP has also requested exemption from the seismic qualification requirements in response to Open Item 18.1 which covers exemption from 10 CFR 100 not IEEE 279. The STP response to Open Item 11.1 suggests that only test data can satisfy the environmental qualification requirements of IEEE 279, Section 4.4. IEEE 279, Section 4.4 specifically states that test data or reasonable engineering extrapolation based on test data can be used to meet the qualification requirements. IEEE 279 does not define what a reasonable engineering extrapolation is and the STP has not identified what provision of engineering extrapolation they are requesting exemption from. Based on this the licensee's proposal using vendor catalog information may be acceptable as long as it is based on some test data and no exemption will be needed by the licensee. The staff believes it is unlikely that a vendor would list any functional and performance information in a catalog without some kind of testing to back it up. The detail prescriptive requirements to meet the environmental and seismic qualification are defined in 10 CFR 50.49 and 10 CFR 100 respectively and exemption may be needed from these regulations rather than from 10 CFR 50.55a(h)(2). However, to be consistent, should exemptions be granted to 10 CFR 50.49 and 10 CFR 100, the staff recommends that an exemption be granted to 10 CFR 50.55a(h)(2) to allow the use of an engineering analysis based on valid test data (not necessarily limited to type test data). STP

has requested exemption from these regulations also and the staff's evaluation is documented in Sections 8.0 and 18.0 of this safety evaluation report.

Conclusion

To be consistent, should exemptions be granted to 10 CFR 50.49 and 10 CFR 100, the staff recommends that an exemption be granted to 10 CFR 50.55a(h)(2) to allow the use of an engineering analysis based on valid test data (not necessarily limited to type test data).

South Texas Plant (STP) 10 CFR Part 100 Exemption Request

STP Proposal

STP requested an exemption to 10 CFR Part 100, Appendix A, Sections VI(a)(1) and (2) to the extent that these sections require testing and inspection to demonstrate that safety-related LSS and NRS SSCs are designed to withstand the SSE and OBE earthquakes. The licensee has not proposed any changes to the design input loads for the LSS and NRS SSCs and has indicated that the design inputs will be specified in the purchase order for replacement components. The licensee has stated that safety-related LSS and NRS SSCs will not be specifically qualified, but STP will perform an "engineering evaluation" to provide an appropriate level of assurance that the procured LSS and NRS SSCs will be able to perform under design basis conditions. However, other sections of the STP submittal (Response to NRC Staff Question # 4) indicate that the performance of engineering analyses, qualification testing, or other specialized efforts to provide empirical evidence of these LSS and NRS SSCs ability to function is "overly burdensome and not necessary." The licensee has also stated in Section 3.3.7.4 of Attachment 1 to its submittal that a procurement request is evaluated to ensure that technical requirements and quality requirements have been adequately described and specified, and that detailed procurement information, catalog identifications, and specifications are documented in the purchase order. The inconsistency in STP's statements was identified as Confirmatory Item 4.1 in the staff draft SER. STP resolved the inconsistency by a revision to UFSAR Section 13.7.3.3.2 listing the methods it proposes to use to evaluate SSCs.

The requested exemption from testing and the preclusion of engineering analysis (presumed by the staff to be a quantitative analysis) by STP, as a means of providing assurance of functionality, led the staff to the conclusion, reflected in Open Item 18.1 that the Part 100 exemption request could not be approved without additional knowledge of the nature and content of a process that would be used to maintain functionality. The STP response to Open Item 18.1 provides a general discussion of the methods it plans to use to determine that an LSS or NRS SSC will meet its safety-related function during design-basis conditions. STP proposed to use any one of the five methods listed below:

- Vendor Documentation
- Equivalency Evaluation
- Engineering Evaluation
- Engineering Analysis
- Testing

Regulation

Part 100 reads as follows: "The engineering method used to insure that the required safety functions are maintained during and after the vibratory ground motion associated with the Safe Shutdown Earthquake shall involve the use of either a suitable dynamic analysis or a suitable qualification test to demonstrate that structures, systems and components can withstand the seismic and other concurrent loads, except where it can be demonstrated that the use of an equivalent static load method provides adequate conservatism."

Part 100 requires that engineering method used to insure functionality involve the use of either 1) a suitable dynamic analysis, 2) a suitable qualification test, or 3) an equivalent static

analysis. One method used for dynamic analysis simulates the SSC by the use of a lumped mass model with the masses concentrated at discrete nodes joined by springs and dashpots to simulate structural flexibility and damping. The forcing function for the dynamic model is the building amplified response spectra at the elevation of the component. The dynamic analysis will simulate internal structural amplification of the component and predict, to the accuracy of the model, the forces, accelerations and velocities of each mass point (node), and the relative displacements of the nodes. From this it can be determined if the displacements are sufficient to cause the component to plastically deform or mechanically bind. The dynamic analysis will also determine the anchorage loads, including the effects of structural amplification within the component. The test method, of course, is the most accurate method. In the test method, the component is mechanically shaken in a manner that simulates the building accelerations and velocities at the elevation where the component is physically located in the plant. In the simplified static load model, conservatively estimated forces and moments are applied to components to determine if plastic deformation or mechanical binding will occur during and after the SSE. The method selected to meet the regulation depends on the complexity of the SSC. A rigid component can be easily qualified using a simple static analysis to obtain anchorage loads. A structurally complex SSC (one that could have several complex modes of response during an earthquake) may require actual testing to identify its response to an earthquake input. It should be noted that although Part 100 requires the use of either of three methods to insure functionality, in fact, there are no other engineering methods available. In that sense, the regulation is not limiting, as it permits the use of all the available options to insure seismic functionality.

Further, the replacement of an SSC that had been previously demonstrated to be functional during and after a seismic event with a like-for-like replacement is acceptable within the context of Part 100 without the need for testing or analysis. Similarly, in the staff's endorsement of IEEE-344-1987, "Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," by Regulatory Guide 1.100, Rev. 2, the staff endorsed, on a case-by-case basis, seismic qualification by the use of experience data, based on the concept of dynamic similarity.

It is also worth noting that unlike 10 CFR 50.49, 10 CFR Part 100 contains no specific or unique documentation requirements or document retention requirements. These would be identical to the design documentation requirements specified in the licensee's quality assurance or design control program. Also, Part 100 does not specify the level of rigor of the analysis or testing to be performed to insure functionality. It only requires that whatever method is chosen insures that the required safety functions are maintained. Therefore, the licensee has the flexibility within Part 100 to perform a simplified bounding analysis or test as long as it provides a justifiable engineering basis to reach a conclusion that the equipment will remain functional during and after a seismic event.

Staff Discussion

The following contains the staff assessment of the five methods STP proposes to use to assure functionality of LSS and NRS SSCs during an earthquake. Each of these methods are acceptable for determining functionality during and after a seismic event subject to the limitations provided below.

Vendor Documentation

STP states that vendor documentation such as catalog information or certificate of conformance could be used to obtain the performance characteristics of the item. The NRC's July 19, 2000, Draft Review Guidelines stated that design inputs be maintained and that the process contains sufficient controls to ensure that safety-related SSCs remain functional. Therefore, in order to provide the minimum level of assurance of component functionality during an earthquake, the catalog information must specify that the item can perform its function subject to an earthquake motion, in both horizontal and vertical axes, that equals or exceeds the response of the supporting structure to the design earthquake input at the location where the item will be installed, while subject to the design load combinations. If the vendor catalog does not contain the level of detail specified above, then the design seismic loads, including necessary design load combinations at the location of the SSC, must be provided in the procurement specification. The vendor's acceptance of the procurement specification without exceptions will provide minimal assurance of functionality under the specified load combinations.

Equivalency Evaluation

STP proposes an equivalency evaluation that it calls a like-for-like replacement. In its draft SER, the staff has already stated that like-for-like replacement in accordance with the guidance of EPRI Report NP-6406, "Technical Evaluation of Replacement Items Guideline, " is an acceptable method to provide assurance of LRS and NRS SSC functionality during an earthquake. STP referenced EPRI report NP-6406 in its August 31, 2000 submittal. The licensee should confirm that their definition of like-for-like replacement is consistent with the definition contained in EPRI NP-6406 and commit in the FSAR to using the EPRI document when performing like-for-like replacements.

Engineering Evaluation

STP proposes to use an engineering evaluation to compare differences between the procured item and the original item. This engineering evaluation is based on seismic experience data. STP indicates that it will use various industry tools in evaluating the seismic adequacy of components but does not commit to any specific procedure. IEEE 344-1987, "Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," contains criteria for seismic qualification by the use of experience data, based on the concept of dynamic similarity. The IEEE 344-1987 criteria, if properly implemented, would provide an acceptable level of assurance of component functionality for LSS and NRS SSCs. Although STP listed five factors it would consider in its evaluation, none of these factors appear to satisfy the IEEE 344-1987 requirements for demonstrating dynamic similarity. In its assessment below, the staff has identified certain aspects that STP must address, relating to the first three factors, to satisfy its conformance with IEEE-344-1987. In the last two factors, STP referenced two EPRI Reports that it may use in its engineering evaluations. The staff is currently assessing these EPRI Reports for consistency with the IEEE 344-1987 requirements regarding dynamic similarity. STP listed five elements it may consider in the engineering evaluation. The staff assessment of each element is discussed below:

- STP states that some components, such as motors and many mechanical components are seismically rugged and are able to perform their function as long as they are properly mounted and anchored. Therefore, STP proposes to evaluate only the

anchorage loads of these components to assure that they would remain in place. The simplified technique of evaluating anchorages is currently used to evaluate rigid components and is an acceptable method to provide assurance of functionality for rigid components. Rigid components have natural frequencies that are not significantly excited by the vibratory motion of the structure, induced by the earthquake.

The term seismically rugged is not a measurable component attribute. In order to apply this approach, STP should replace the term seismically rugged with seismically rigid in its submittal and define components to be to be seismically rigid if their fundamental frequency is above 33 Hertz. The licensee's procedure for justification that the component can withstand the static loads and remain functional should include an evaluation of the structural integrity of internal piece parts necessary for functionality of the SSC, such as, motor brushes and their mountings.

- STP states that seismic experience has shown that the functions of some components, such as fuses, are insensitive to seismic events and can be accepted without further analysis. Other than fuses, STP did not specify the components it considers seismically insensitive. Further, the licensee has not provided sufficient technical basis for the staff to accept the blanket assertion that all fuses are insensitive to seismic events. In fact, fuses were not on the list of seismically insensitive components contained in EPRI Report TR-7484 which was referenced in the STP response.

  The licensee should commit to use the methodology contained in EPRI Report TR-7484 for the evaluation of seismically insensitive SSCs. A copy of the EPRI report was provided to DE for staff review on February 1, 2001. The staff will read and familiarize itself with the methodology and results contained in the EPRI document. Any items in the EPRI document identified by the staff that call into question its ability maintain seismic functionality will be resolved with STP.

- STP states that components mounted near the ground will experience lower seismic loads than components mounted at higher elevations. Therefore, STP proposes to use a more simplified evaluation procedure for the components mounted near the ground. The complexity of the evaluation of a component functionality during a seismic event, is immaterial of its location, since the established component seismic capacity must envelop the projected seismic demand (i.e., in-structure response spectra) at the location where the component is mounted. STP should describe the simplified procedure it intends to use for these components.

- STP has referenced EPRI Report TR-105489 that it may use to evaluate the seismic functionality of components. The report was not provided with the STP response. A copy of the EPRI report was provided to DE for staff review on February 1, 2001. The staff will read and familiarize itself with the methodology and results contained in the EPRI document. Any items in the EPRI document identified by the staff that call into question its ability maintain seismic functionality will be resolved with STP.

- STP stated that it may use the procedures in EPRI report TR-7484. STP indicates that this procedure provides guidelines for accepting components by determining it is either seismically rugged or seismically insensitive. A copy of the EPRI report was provided to DE for staff review on February 1, 2001. As stated above, the staff will read and familiarize itself with methodology and results contained in the EPRI document. Any

items in the EPRI document identified by the staff that call into question its ability maintain seismic functionality will be resolved with STP.

Engineering Analysis

STP proposes to perform a seismic analysis of an SSC when there is a substantial difference between the replacement component and the original component. The licensee should confirm that the seismic analysis to be performed is a dynamic analysis described above. A dynamic analysis of an SSC using the design seismic loads and load combinations is acceptable to the staff for determining the functionality of an SSC during and after an earthquake.

Testing

STP proposes to use a commercial test of the component under simulated seismic conditions for cases where seismic analysis is not feasible. STP further states that margins, detailed documentation, and additional assurance specified in Appendix A of Part 100 would not be required in these tests. As pointed out above, Part 100 does not have any documentation requirements and does not address margins (it only requires the SSC to be able to perform its safety function). Further, it is not clear what is meant by STP's statement regarding "the additional assurance specified in Part 100." Although the staff considers shake table testing of an SSC with simulated design loads applied an acceptable approach for determination of functionality, the staff cannot make a finding that the STP proposal will provide the minimal level of assurance of LSS and NRS SSC functionality during an earthquake without further clarification of what is meant by commercial testing. As specified in the NRC's draft guidelines, STP may use the test procedure contained in a national consensus standard, such as IEEE 344-1987, in order to provide the minimal level of assurance of LSS and NRS SSC functionality during an earthquake. This testing should be controlled and documented in accordance with the quality control and documentation requirements specified in NRC approved STP programs for LSS and NRS components.

Conclusion

The STP response to Open Item 18.1 lists five proposed methods to provide confidence that LSS and NRS replacement SSCs will function during an earthquake. STP indicates that it may use any one of five proposed methods. The staff believes that subject to the limitations above, and the acceptability of the clarifications requested, each method would be acceptable to provide assurance of functionality. The staff is currently reading and familiarizing itself with the two EPRI reports that were referenced in one of the proposed methods (engineering evaluation). These reports were provided to the DE staff on February 1, 2001. Since the staff has not seen these documents prior to February 1, the staff estimates that it will require approximately one month to read and familiarize itself with these reports and resolve with STP any issues that call into question its ability maintain seismic functionality.

The staff concludes that STP needs to address those areas identified above in order to provide sufficient basis that its proposal for evaluating the seismic capacity of LSS and NRS SSCs will furnish the minimal level of assurance of SSC functionality during and after an earthquake. If the technical issues raised by the staff are adequately addressed and the staff concludes that the EPRI methodology will provide a minimal assurance of functionality for LSS components, then granting an exemption to Part 100 with conditions and limitations may be appropriate.

OPEN ITEM 3.5

The staff finds much of the proposed exemption request acceptable.

- Uses the RI-ISI methodology for Class 1 and 2
- LSS piping welds are not required to be inspected, which is consistent with RI-ISI.

The Staff open items are in the following areas:

❶ The system pressure test is needed to periodically confirm that the system is fully intact and therefore that sufficient margin is maintained.

❷ The proposed categorization of Class 3 SSCs based on the deterministic methodology does not allow for identification of system segments or parts that may have a medium of high safety significance. An acceptable categorization methodology must be systematic and thereby provide confidence that MSS or HSS segments are not categorized LSS.

Mechanism for determining the impact of the degradation of functions in several systems due to the failure of SSCs in different systems.

Walkdown to provide confidence that spatial effects have been adequately assessed.

Allow for different safety significant categories for failures of different segments within a system.

❸ Need a description on how a components pressure boundary integrity (e.g., valve bodies, heat exchangers, etc.) will be categorized. If the component pressure boundary integrity function will be categorized differently than the piping attached to the component, this difference will need to be justified.