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DATE OF MEETING
02/15/2001

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Docket Number(s)	**05000498, 05000499**
Plant/Facility Name	**South Texas Project, Units 1 and 2**
TAC Number(s) (if available)	**MA6057, MA6058**
Reference Meeting Notice	**Dated 2/2/01**
Purpose of Meeting (copy from meeting notice)	**To discuss the NRC's draft Safety Evaluation on the risk-informed multipart exemption request to the special treatment requirements in 10CFR Parts21, 50, and 100.**

NAME OF PERSON WHO ISSUED MEETING NOTICE	TITLE
John A. Nakoski	**Senior Project Manager**

OFFICE
NRR

DIVISION
DLPM

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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	Discussion 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.

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.

SOUTH TEXAS PLANT (STP) 10 CFR 50.55a(h)(2) EXEMPTION REQUEST

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).

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 safety 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.